



# Proposed District Plan submission form

Clause 6 of the First Schedule, Resource Management Act 1991.

Feel free to add more pages to your submission to provide a fuller response.

To: Central Hawke's Bay District Council			
<b>1. Submitter details</b>			
Full Name	Last <b>Osborne</b>	First <b>Simon</b>	
Company/Organisation (if applicable)	<b>NZ Association of Radio Transmitters, Inc and Hawke's Bay Amateur Radio Club</b>		
Contact Person (if different)			
Email Address			
Address			Postcode
Phone	Mobile	Home	Work
<b>2.</b> This is a submission on the Proposed District Plan for Central Hawke's Bay			
<b>3.</b> <input type="checkbox"/> I could <input checked="" type="checkbox"/> I could not – gain an advantage in trade competition through this submission (Please tick relevant box)			
If you could gain an advantage in trade competition through this submission please complete point 4 below:			
<b>4.</b> <input type="checkbox"/> I am <input checked="" type="checkbox"/> I am not – directly affected by an effect of the subject matter of the submission that:			
(a) adversely affects the environment; and <input checked="" type="checkbox"/> does not relate to trade competition or the effects of trade competition. (Please tick relevant box if applicable)			
Note: If you are a person who could gain an advantage in trade competition through the submission, your right to make a submission may be limited by clause 6(4) of Part 1 of Schedule 1 of the Resource Management Act 1991.			
<b>5.</b> <input checked="" type="checkbox"/> I wish <input type="checkbox"/> I do not wish – to be heard in support of my submission in person (Please tick relevant box)			
<b>6.</b> <input checked="" type="checkbox"/> I will <input type="checkbox"/> I will not – consider presenting a joint case with other submitters, who make a similar submission, at a hearing. (Please tick relevant box)			
<b>7.</b> Do you wish to present your submission via Zoom? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
<b>8.</b> Please complete section below (insert additional boxes per provision you are submitting on):			
The specific provision of the plan that my submission relates to:			
<b>Section 15.9.10</b>			
Do you: <input checked="" type="checkbox"/> Support <input type="checkbox"/> Oppose <input checked="" type="checkbox"/> Amend (Please tick relevant box)			
What decision are you seeking from Council?			
Reasons:			
<b>Include the matters outlined in the enclosed NZART submission under the paragraph "The Council Decisions Sought" under section 15.9.10 (refer to email)</b>			
Please note: All submissions will be treated as public documents and will be made available on Council's website. However, you may request that your contact details (but not your name) be withheld. If you want your contact details withheld, please let us know by ticking this box. <input checked="" type="checkbox"/>			



Simon Osborne

6 August 2021

Central Hawkes Bay District Council  
P.O. Box 127, Waipawa 4240

ATT: Mayor Alex Walker  
CC: District Plan Review Planner

Your worship Mayor Alex Walker

### **NZART Submission to the Proposed District Plan under section 15.9.10**

In addition to my submission of the 17<sup>th</sup> of Feb 2020, this submission is in support of the provisions which have been included by the Central Hawke's Bay District Council in the Proposed District Plan under section 15.9.10, but we raise one or two related matters which have not been mentioned, as outlined in the paragraph "The Council Decisions Sought".

#### **The Council Decisions Sought**

1. Include a Definition of Amateur Radio Configurations (ARC), being "[amateur radio configuration means antenna, aerials and associated support structures which are owned and operated by licensed amateur radio operators.](#)"

Rationale: The Amateur Radio Licence qualifies the holder not just in radio technology, but in national and international law as well. Other users of the radio spectrum, who will also want to use aerials, are not so specifically qualified, and it is Council's interest to make this distinction for the management of Council's own District Plan Rules.

2. It is implied, but not explicitly stated, that the heights given in Section 15.9.10 apply irrespective of the Definition of Height in the definitions section. Height in Relation to Boundary. In the Proposed District Plan, the definition of "Recession Lines" does not make any exception for Amateur Radio Configurations.
3. In a previous era, this was frequently known as "Daylight Profiles" and was predicated on a neighbour's right not to suffer significant deprivation of sunlight or daylight from neighbouring properties. Because aerial poles are usually very slender (generally 114mm or less) they do not cast a shadow beyond about 10 meters away. For that reason, we seek exemption that Amateur Radio Licence
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5. For that reason, we seek exemption that Amateur Radio Configurations not be subject to Height in Relation to Boundary or Recession Line rules. They would, of course, still be subject to setbacks.

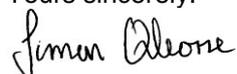
Rationale: With a traditional residential section being about 20 metres wide, (and more recent subdivision having even smaller sections) the place where the maximum height of aerial would need to be placed would be the middle, i.e., 10 metres on an "average" section from either boundary. That would result in the maximum aerial height being around 12 metres. It would be rather contradictory to having a "permitted" height of 20 metres, while the maximum allowed is simultaneously limited to 12 metre by Recession Line rules.

6. We wish to appear in person at any hearing to present our case.

Thank you for your time and consideration of our submission.

I look forward to your response.

Yours sincerely,



Simon Osborne ADM, Dip Fire, Dip Tch (TAFE), MAIES

6 August 2021

## Submission to the Central Hawkes Bay Proposed District Plan Review

Joint Submission of the:

- Hawkes Bay Amateur Radio Club (Branch 13 of NZART)
- New Zealand Association of Radio Transmitters, Inc. (NZART).

### Submitter Details

Simon Osborne, Dip Fire, Dip Tch (TAFE), MA ES

Hawkes Bay Amateur Radio Club

We wish to appear in person at any hearing to present our case.

This document is in support of Simon Osborne's 17<sup>th</sup> Feb 2020 submission during the Draft Plan process.

### Scope

There appeared to be no provision anywhere in the Operational District Plan for Amateur Radio Configurations (ARCs), so after Simon Osborne made contact with the Central Hawke's Bay District Council, changes were made in the Proposed District Plan which incorporated good provisions for Amateur Radio Configurations. This submission is in support of the provisions which have been included in the Proposed District Plan, but we raise one or two related matters in the paragraph "The Council Decisions Sought".

### Context

Radio waves do not recognise national boundaries, so they have to be managed internationally. The International Telecommunications Union (ITU), an operational department within the United Nations, every five years holds a world administrative radio conference (WRC) in which every government, every military, all the significant telecommunications authorities, significant tertiary establishments, satellite operating companies, and other significant users of radio spectrum, come together to regulate/allocate spectrum.

Commercial operators can make billions of dollars through radio-based services they can offer, and the military has multiple complex needs in order to maintain security, so there is real pressure on the ITU for spectrum allocation.

However, there is one thing that all parties agree on – there must be an allocation for experimental development, and this has to be free of commercial and/or security bias, so right up the spectrum, from the lowest frequencies to the super high frequencies there are blocks of bandwidth set aside for this experimentation.

Each bandwidth block has its own characteristic performance issues and needs different treatment. These are the blocks which are allocated to unpaid professionals (called amateurs) for experimentation.

No radio amateur has the ability or inclination to experiment with everything, as a result each radio amateur has his/her own preferences, so in allocating District Plan rules two fundamental factors emerge:

- 1) Councils should avoid putting in place rules (or lack of rules) which frustrate the objectives of the United Nations and the International Community in general.
- 2) There cannot be “one size fits all”. Councils cannot satisfy everyone. In seeking permitted Amateur Radio Configurations in District Plans, we therefore aspire to achieving a compromise – a “Basic Set” of rules which will satisfy a wide range of preferences.

### Broadening our Perspectives

- If the concept of “Serious Leisure Perspective” is researched, it will become evident that on one end of the “Leisure Spectrum” there are “Hobbies” and at the other end there are “Volunteers” and “Amateurs”.
- Amateur Radio is an Experimental Science, licenced under International and Domestic law. There are international treaties associated with this law.
- Hobbies include pastimes such as making collections, and some things that come to mind are a garden full of 47 different gnomes, or a collection of 367 salt cellars from all over the world. These are impressive collections for the Hobbyist, but they provide no tangible benefit to society.
- Amateur Activities, on the other hand, include Theatre, Geology, Astronomy, Archaeology, and several examples of Experimental Science. Amateur Radio is an experimental technology which has provided, and is still providing, many innovative developments in the field of radio technology which the general population, by and large, now takes for granted. Unlike Hobbies, Experimental Science does provide tangible benefits to society, and should not be dismissed lightly, as one might dismiss many “hobbies”.

In some other districts, NZART has not infrequently encountered very prejudiced views on this issue. District Planners frequently dismiss amateur radio as just a toy for rich people to dabble with and are completely closed to the suggestion that it is an essential experimental science. Fortunately, that doesn't appear to be the case in Central Hawkes Bay.

### Amenity Values of Amateur Radio

The decisions that Councils make on the permitted status of anything in the Plan inevitably results from a judgement of the amenity effects of different groups within the community. It is acknowledged that to some people the existence of amateur aerials adversely affects their “Visual Amenity”.

Council's task is to balance the loss or gain of amenity of one group against the loss or gain of amenity of another group. Visual Amenity is very much a subjective quantity and depends very much on the perspective of the viewer. On the other hand, the amenities of amateur radio are generally objective, and must be seriously weighed up in any decision about any "permitted" status.

Amateur Radio provides to the Community: -

- Telecommunications and information technology expertise.
- A reliable system of communication during civil or environmental emergencies.
- Competent communications for Search and Rescue.
- A widely dispersed source of experimental researchers.
- Encouragement for students to study Science, Technology, Engineering and Mathematics (STEM) – subjects which are in significant demand and keep New Zealand as a significant player in international technology development.
- Space technology. Radio amateurs are the only group outside Governments, the Military, and large corporates that have operated satellite technology continuously since the 1970s.

Amateur Radio provides to the Individual: -

- Guidance and education towards qualifying for an amateur radio licence
- Self-Education in technology.
- An interest that can be pursued throughout life.
- A network of friendships linked by radio communications.

The Amateur Radio Licence allows operators to design and build their own equipment, because it is specifically set up as an experimental and/or technology development service. It is the only radio service in which it is the licensed operator, and not the equipment, that is licenced.

In ALL other types of radio service, it is a requirement that "type approved" equipment which has been rigorously tested to meet tight technical specifications must be used, and that equipment must not be modified.

In the book "Radio Science for the Radio Amateur" the author Eric P. Nichols makes the point:

"A big difference between Big Science and Amateur Science is that most of the "official" participants in the former do it as a full-time job. Radio Amateurs who do Radio Science, for the most part, do it in their free time. That is why it is called amateur, which means that the work is done without pay, not that it is done without expertise."

Restrictive controls applied to Amateur Radio Configurations (ARC) could put at risk the amenity of attracting future electronic technologists from being spread widely through the community. Several highly qualified people have been known to check out how "amateur friendly" a particular district is before relocating.

It should be recognised that not every amateur wants to use large Amateur Radio Configurations as his/her experimental preferences. Most use aerials that are of a similar scale to standard TV aerials. The aerial dimensions depend entirely on the frequency bands they are interested in.

## Some Aerial Fundamentals

Aerials are the means by which radio signals are launched into space, (transmitted) and by which signals in space can be captured (received). An aerial is far more effective if it is “resonant” on a desired frequency, and generally an aerial resonant on one frequency could be virtually useless on other frequencies.

Every frequency has a corresponding “wavelength” - for instance, a 3.5MHz frequency has a wavelength of about 80 metres, and a 144 MHz frequency has a wavelength of 2 metres. The baseline for an aerial to be “resonant” is that its length needs to be half a wavelength long, so a 3.5 MHz aerial needs to be 40 metres long, and a 144MHz aerial needs to be one metre long.

## Aerial Heights

The effectiveness of any aerial is fundamentally affected by its height above ground. If for a moment, we turn our attention to the Yagi (as defined above) we have an aerial which in free space. (that is, well above the atmosphere of the earth) is highly directional. It behaves like a torch beam – sending out all its “light” in the direction it is pointed.

- But close to the ground, its performance changes dramatically. If, for instance, it is just half a metre above the ground a) a large component of its signal will be absorbed by the ground, and b) that part which is not absorbed will go vertically upwards.
- Mounted about 5 metres above ground, the signal splits into two parts – a component which comes out of the aerial itself, and another component which is reflected by the earth. The resulting ray from this “low” aerial may travel upwards at about 45° to the horizontal.
- If it is mounted, say, 20 metres above the earth, the main beam will travel only slightly upwards – at around 60° to 100° above horizontal. This is the sort of angle that is required to get a signal to travel around the world.

Height is therefore a very essential feature of an effective aerial, and it is the first thing that Council Plans seek to control. When faced with this issue during the 2012 Environment Court case in Tauranga City, the presiding Judge is reported in the local newspaper as saying:

### **What Judge Jeff Smith said:**

"In our view, 20m represents a reasonable provision for the radio community, while balancing that against the potential impact.

"Permitted activity status has the advantage of the council not becoming involved in extensive and expensive applications for consent from an almost minute sample of the population of Tauranga.

"There are potentially some amenity impacts. In our view, those are on adjoining neighbours. Others we disregard in the end as being minimal. Those [impacts] on adjoining neighbours must be balanced against the national and international need to encourage the amateur radio transmission community.

"Radio amateurs constitute an important part of our community, particularly in times of emergency.

"The issue in this case should not turn upon whether or not people agree [with an aerial next door] but whether it is appropriate to provide for radio amateurs or not."

## Recognition of amateur radio aerial diversity

The geographic location of New Zealand means that long distances exist between amateurs here and those overseas. Radio signals are correspondingly weak, and efficient aerials/antennas are required to send and receive such signals.

Radio waves travel through the ionosphere in the upper parts of the atmosphere and may return to earth depending on the frequency of operation. For reliable communication during day or night, summer or winter, the desirable frequencies for long distance communication are found typically between the 7 MHz band (the 40 metres wavelength) and the 28 MHz band (10 metre wavelength).

With variation in the sun's activity the highest usable frequency may be reduced to the 14 MHz band (20 metres) or even lower. The propagation of radio waves is variable but nevertheless antennas for this range of frequencies are used by many amateurs for long distance communications.

Scientists and amateurs have studied, simulated, constructed, and measured the performance of antennas to find the most suitable configurations at every frequency that the Licence permits an amateur to use. The performance of an antenna depends on the radiation pattern where its best efficiency occurs.

Based on the frequencies required for long distance communication and how the pattern of an antenna changes with height, an academic paper by K Siwiak PhD, MSEE, PE, SMIEEE is included was an attachment. In summary it says: -

“Optimum height is 1.5 to 1.6 wavelengths for any one band, or a compromise height can be found for a multiband antenna operating over several bands by using the optimum for the highest frequency.”

And also, “If operation anywhere within the 10 – 40 metre bands are of equal interest, the “best” height works out to be 19.9 metres.”

When the sun limits the upper frequency to the 20-metre band (or lower), it is desirable that the antenna height should be raised. A height of 20 metres is desired for the primary supporting structure for amateur radio configurations

New problems have emerged over the last 50 years. The number of devices using radio frequencies has increased exponentially, and many of them unintentionally produce noise and interference to radio communication networks.

This has resulted in man-made background noise level rising every year. Whereas 50 years ago, an army surplus radio outputting six watts of RF energy was able to communicate anywhere in New Zealand, radios are now outputting more than fifty times the power and they still cannot always be heard above the background noise level.

This has resulted in radio amateurs experimenting with many different aerial systems to try to improve the wanted signal response, and to reject at least some of the unwanted noise. Aerial experimentation might result in several different configurations being tried out in any one year on any one site.

In addition, due to the sun changing the electrical properties of the upper atmosphere it may be necessary for an amateur radio operator to change his/her frequency up to four different bands during the course of the day to maintain communication to a specific part of the world. Each change will require a change in the transmitting aerial.

In his book "Radio Science for the Radio Amateur" the author Eric P. Nichols provides some very interesting perspectives concerning science. After following a professional career, in the preface he writes:-

"Even monster installations like HAARP or EISCAT (European Incoherent SCATter) facility in Tromso, Norway, can only be in one place at once. Hams are everywhere, and a lot of ionospheric research can only be done with widely scattered sensors, which Hams are uniquely equipped to provide..... Much of the research can be performed by the Amateur Radio community ..... And that we can contribute significantly, towards completing some long unfinished business regarding understanding radio propagation."

To a greater or lesser degree, every active amateur is continuously contributing to science, because it is only through communicating with other parts of the world or country that practical data on when and how radio waves propagate is able to be collected and analysed.

This is not possible with commercial networks which are invariably point to point services, engineered very conservatively. Usually, it is only when communication links are operated at the limits of their capabilities that useful scientific knowledge is obtained.

### Defining the need for neighbourly approval

Immediate neighbours have been known to lodge objections. Neighbours move house from time to time, and unless ARCs are defined clearly in the Plan, amateur radio operators can now be faced with expensive proceedings.

While good neighbourly relations are sought, there are some people who delight in creating difficulty, which is why the Plan should clearly state a comprehensive ARC definition.

A vexatious resource consent hearing could cost the amateur radio operator far more than the ARC equipment - and could even result in causing affected Amateurs to give up on their self-education and technological passion, for which a nationally recognised and regulated Licence had been granted.

### How are aerials used?

a) The 80m band is useful for communication over the length and breadth of New Zealand, and probably one third of active radio amateurs might want to operate on that band. In its basic form it would require two poles, preferable 12 to 15 metres high, 40 metres apart, with a thin wire between them.

b) VHF and UHF bands are used for local line-of-sight transmissions, and for very local contacts short vertical "whip" antennas work well. For transmission over longer distances they require multi-element Yagi arrays, most of which would be commensurate in size and style to older TV antennas. Being line-of-sight bands, the possible communication distance becomes greater if the antennas are higher. Generally, these would be at 10m to 12m height on a simple pole, with a rotator at the top.

c) High Frequency Bands (for example, the 20m to 10m bands) are most useful for international communications. Because distances from an island in the middle of the South Pacific to the bulk of other population centres in Europe and North America are very long, it is desirable to direct the signal in a beam towards the desired country. Complex wire antennas can be used, but generally they are limited to one specific direction, so the preferred style of antenna is a Yagi, which can be pointed in the desired direction by a "rotator".

Unfortunately, these HF Yagis can be very large. A full sized three element Yagi for the 20m band would have three elements each approximately 10m long, on a boom which is 7 metres long.

It is possible to use “coils” to reduce the physical length of elements to about 7m (on a 7m boom). By very clever design, these coils can be designed to enable other bands to also work on the same antenna, so a Yagi with 14m elements on a 7m boom with strategically place “enlargements” in the elements could work equally well on all six bands from 40m to 10m band. Such an aerial would be called a “Multi-band Yagi”.

This option has a far less visual impact than the option of having individual Yagis for each of the most commonly used bands.

Please note, however, that more useful HF Yagis can get quite large in size, and the dimensions given in the proposed rules allow for that.

### Rules to be incorporated in the Plan

We support all the rules that have been incorporated in the Proposed Plan under section 15.9.10. However, there are some aspects which have not been mentioned, as outlined in the next paragraph.

### The Council Decisions Sought

1. Include a Definition of Amateur Radio Configurations (ARC), being “[amateur radio configuration means antenna, aerials and associated support structures which are owned and operated by licensed amateur radio operators.](#)”

Rationale: The Amateur Radio Licence qualifies the holder not just in radio technology, but in national and international law as well. Other users of the radio spectrum, who will also want to use aerials, are not so specifically qualified, and it is Council’s interest to make this distinction for the management of Council’s own District Plan Rules.

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Rationale: With a traditional residential section being about 20 metres wide, (and more recent subdivision having even smaller sections) the place where the maximum height of aerial would need to be placed would be the middle, i.e., 10 metres on an “average” section from either boundary.

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6. We wish to appear in person at any hearing to present our case.
7. If others make a similar submission, we will consider presenting a joint case with them at a hearing.

Thank you for your time and consideration of our submission.

I look forward to your response.

Yours sincerely,

New Zealand Association of Radio Transmitters Inc.



Simon Osborne ADM, Dip Fire, Dip Tch (TAFE), MA ES