

# Managing Courtesy Tones in Allstar

Most amateur radio operators that have used a repeater know what courtesy tones are, it is the tone that you hear when a transmission is ended. A courtesy tone serves several purposes in both the repeater and Allstar communities. It tells other users that a transmission has ended and it encourages users to wait at the end of a transmission before keying up. Thus like its name implies it makes for a courteous break between transmissions which is especially desirable on Allstar to allow others to break in and additional time for distant repeaters and nodes to reset their timers. Most repeaters and Allstar nodes have timeouts which are not reset until the tone is heard.

It is desirable to use courtesy tones in Allstar whether you are using a simplex or duplex node. In the case of a simplex node a user would have no knowledge they actually reached your node without the response the courtesy tone gives. If you are using Allstar to control a repeater it would be only natural to use a courtesy tone but in some cases where a separate repeater controller is used the courtesy tone can be turned off.

The Allstar courtesy tones are defined in `/etc/asterisk/rpt.conf` in the `[telemetry]` section and the actual operation is mapped to the tone functions in the individual node sections of that file. Multiple nodes on a server can have different tone mappings.

Courtesy tones in Allstar can be turned off on a per node basis by placing the following command in each nodes definitions at the beginning of the `rpt.conf` file.

**nounkeyct=1**

The default if this statement is **not** present, **commented out**, or **=0** is to **allow** courtesy tones.

Courtesy tones can be defined as a tone or series of tones, a CW string, or an audio file. Remember that those on your repeater or node are the only users that will hear your courtesy tone. Courtesy tones do not propagate onto the network. You also do not want to make a courtesy tone too long in duration. For instance you would not want it to be your CW ID!

## Defining a tone group

Tones are defined in the telemetry section of `rpt.conf`. Each tone group is defined as a `ctX=` Where X is an integer. As many tone as you want can be defined but only those that are mapped in the node section of `rpt.conf` are used. Also note that if a courtesy tone is not mapped the default program tones, described below, are used.

A tone group (`ctX=`) is a set of 4 comma separated integers defining a tone and formatted as follows:

(frequency1,frequency2,duration,amplitude)

Frequency1 and frequency2 must be a number between 0 and 3000. These specify the tone frequency in Hz. Duration is the tone on time in milliseconds. Amplitude is the relative volume level of the tone or tones. This can be from 0 to 8192.

A tone group consisting of zeroes for amplitude and frequency will be sent as a silent period.

A single frequency tone can be sent by setting frequency2 to zero.

Multiple definitions can be made each enclosed in parenthesis to define more complex tones.

Note: There must be no spaces between the commas, numbers, or the parenthesis.

When no telemetry definitions are defined in the rpt.conf telemetry section the default program tones are used. This often leads to confusion when a user says they undefined the tone and it still exists, in that case the defaults are used. The default tones are -

```
ct1 - (350,0,100,3072)(500,0,100,3072)(660,0,100,3072)
ct2 - (660,880,150,3072)
ct3 - (440,0,150,3072)
ct4 - (550,0,150,3072)
ct5 - (660,0,150,3072)
ct6 - (880,0,150,3072)
ct7 - (660,440,150,3072)
ct8 - (700,1100,150,3072)
ranger - (1800,0,60,3072)(0,0,50,0)(1800,0,60,3072)(0,0,50,0)(1800,0,60,3072)(0,0,50,0)(1800,0,60,3072)
(0,0,50,0)(1800,0,60,3072)(0,0,50,0)(1800,0,60,3072)(0,0,150,0)
remotemon - (1600,0,75,2048)
remotetx - (2000,0,75,2048)(0,0,75,0)(1600,0,75,2048)
cmdmode - (900,904,200,2048)
functcomplete - (1000,0,100,2048)(0,0,100,0)(1000,0,100,2048)
remcomplete - (650,0,100,2048)(0,0,100,0)(650,0,100,2048)(0,0,100,0)(650,0,100,2048)
pfxtone - (350,440,30000,3072)
```

Here is what the stock BBB and RPi2 telemetry definitions in rpt.conf look like -

```
[telemetry]
```

```
ct1=|t(350,0,100,2048)(500,0,100,2048)(660,0,100,2048)
ct2=|t(660,880,150,2048)
ct3=|t(440,0,150,4096)
ct4=|t(550,0,150,2048)
ct5=|t(660,0,150,2048)
ct6=|t(880,0,150,2048)
ct7=|t(660,440,150,2048)
ct8=|t(700,1100,150,512) ; 2048 amplitude
remotetx=|t(1633,0,50,3000)(0,0,80,0)(1209,0,50,3000);
remotemon=|t(1209,0,50,2048)
cmdmode=|t(900,903,200,2048)
functcomplete=|t(1000,0,100,2048)(0,0,100,0)(1000,0,100,2048)
patchup=rpt/callproceeding
patchdown=rpt/callterminated
```

As an example ct8, which is linked to linkunkeyct and is the tone you hear when a user on a connected network drops carrier, consists of a tone of 700 hertz followed by a tone of 1100 hertz both with a duration of 150 milliseconds at an amplitude of 512. This is a reduced level from the commented 2048 to make the

tones less obtrusive.

These tones are mapped in each node section of rpt.conf. In the stock configs they are mapped in this way -

unlinkedct=ct2 ; Sent when not connected to another node

remotect=ct3 ; Sent when remote base connected

linkunkeyct=ct8 ; sent when a network user unkeys

So when you are not connected to any other node you would hear the ct2 defined tone and when connected the ct8 tone when a remote user drops.

## Custom tone examples

Here are some example tones that can be defined (courtesy of W2YMM) -

ctX=|t(0,0,640,0)(330,0,50,2048)(495,0,50,2048)(660,0,50,2048) ; YELLOW JACKET

ctX=|t(800,0,100,2048)(800,0,100,2048)(540,0,100,2048) ; SHOOTING STAR

ctX=|t(500,0,100,2048)(500,0,100,2048)(750,0,100,2048) ; COMET

ctX=|t(750,0,125,2048)(808,0,80,2048)(880,1200,80,2048) ; STARDUST

ctX=|t(0,0,640,0)(660,0,50,2048)(500,0,50,2048)(385,0,50,2048) ; HORNET

ctX=|t(1000,0,20,2048)(800,0,20,2048)(600,0,20,2048) ; TUMBLE WEED

ctX=|t(0,0,640,0)(660,0,100,2048)(500,0,100,2048)(385,0,100,2048) ; WASP

ctX=|t(1500,0,20,2048)(1250,0,20,2048)(1000,0,20,2048)(750,0,20,2048)(500,0,20,2048)(2550,0,20,2048);  
CHIRPCHOMP

ctX=|t(1000,800,50,2048)(800,0,50,2048)(600,0,50,2048)(1500,0,50,2048) ; MOONBOUNCE

ctX=|t(500,700,100,2048) ; UONK

ctX=|t(1000,0,100,2048) ; BEEP

ctX=|t(440,0,100,2048) ; BOOP

ctX=|t(840,500,100,2048) ; BLOOP

ctX=|t(1000,0,50,2048)(750,0,50,2048)(500,0,50,2048) ; DESCENDING

ctX=|t(500,0,50,2048)(750,0,50,2048)(1000,0,50,2048) ; ASCENDING

ctX=|t(1760,0,30,2048)(0,0,30,0)(1760,0,30,2048)(0,0,30,0)(1760,0,30,2048) ; NEXTEL

ctX=|t(2450,0,200,2048) or ctX=|t(2500,0,100,2048) ; NASA OVER

ctX=|t(2175,0,200,2048)(1950,0,175,2048) ; MOTOROLA TONE REMOTE 1

ctX=|t(2175,0,75,2048)(1950,0,50,2048) ; MOTOROLA TONE REMOTE SHORT

ctX=|t(0,0,640,0)(660,880,100,2048) ; PIANO CHORD

As you can see each definition has a name which roughly describes what it sounds like. Feel free to experiment and add your own definitions or change these to suit your needs.

To use a tone just copy the entire line into the telemetry section of your rpt.conf and change the 'X' in ctX to the number you want to replace commenting out any former definitions for that tone.

Note that the mapping of remotetx sets the tone you hear when you unkey **locally** on a connected network and linkunkeyct is what you hear when a network user unkeys. This is confusing because when you change linkunkeyct you will only hear the change if someone outside of your node unkeys. Test this with another network user or another node within your LAN.

When you modify the rpt.conf file you must either reread the configuration or restart Allstar.

To reread rpt.conf -

```
asterisk -rvvv
```

```
CLI>rpt reload
```

```
CLI>exit
```

or to restart Allstar at the Linux prompt -

```
astres.sh
```

### **CW courtesy tone**

A courtesy tone can also be defined as a CW character or characters. The one that would often be used is a "K" for end of transmission. To define CE character(s) use the I prefix -

```
ct8=|iK
```

This would send the CW "K" dah-dit-dah at the end of a network connected transmission.

### **Voice courtesy tone**

To send a voice file as a courtesy tone use this syntax -

```
ct8=|/etc/asterisk/local/ct-unkey
```

This would send the audio file ct-unkey in /etc/asterisk/local at the end of a network connected transmission. The audio file would be named the format it is filename.ul, gsm, etc. but the extent is never used when specifying the file.

For detailed information on creating audio files for Allstar see -

<http://images.ohnosec.org/app-rpt-audacity.pdf>

When using any of these courtesy tone definitions you should not make the length any longer than necessary. This would delay the transmitter from unkeying and on a simplex node it would delay your ability to transmit until it was finished.

References -

<http://ohnosec.org/drupal/node/96>

<http://www.w2ymm.com/myallstarlink.html>