Transcript: It’s Been a Good Run, Phone Providers.

Video ID: 40llxjrIG3w

Extraction Date: 2025-04-02 06:46:31

**[00:00:00]** move over flipper zero because there's a

**[00:00:01]** new tech darling in town it's called

**[00:00:03]** mesh tastic and it promises to bring us

**[00:00:05]** an off-grid decentralized comms Network

**[00:00:08]** that's entirely open source and outside

**[00:00:10]** the control of Big Brother best of all

**[00:00:13]** it runs for free on Tiny affordable and

**[00:00:15]** low powerered radios sporting esp32

**[00:00:18]** microcontrollers but besides looking

**[00:00:20]** really cool and getting me to empty my

**[00:00:21]** wallet what can these things actually do

**[00:00:24]** well think text-based walkie-talkies

**[00:00:26]** enabling you to send encrypted messages

**[00:00:28]** over long range radio AKA Laura this

**[00:00:31]** novel application Shields your

**[00:00:33]** Transmissions from potential wiretapping

**[00:00:35]** by big telecommunication companies

**[00:00:37]** ensuring your messages remain

**[00:00:39]** confidential and most importantly yours

**[00:00:42]** but it goes even deeper there are a

**[00:00:44]** number of scenarios today where

**[00:00:46]** traditional cellular networks fail for

**[00:00:48]** instance Urban festivals and Gatherings

**[00:00:50]** where the cell network is saturated like

**[00:00:52]** New Year's Eve in Time Square

**[00:00:54]** overlanding or other remote adventure

**[00:00:56]** activities in isolated areas like

**[00:00:58]** deserts also overseas traveling if you

**[00:01:01]** don't have roaming or a local Sim and

**[00:01:03]** NGO work in places without cell

**[00:01:05]** infrastructure we'll also cover the most

**[00:01:07]** common pitfalls enthusiasts make and how

**[00:01:09]** to correct those finally I'm taking this

**[00:01:11]** Innovation to new heights literally by

**[00:01:13]** outfitting my drone with one of these

**[00:01:15]** groundbreaking devices to conduct an

**[00:01:17]** epic range test to see how far these

**[00:01:19]** things can actually go by the end of

**[00:01:21]** this video you'll thoroughly appreciate

**[00:01:23]** the unique Freedom that these powerful

**[00:01:25]** mini Mish tastic devices provide and

**[00:01:27]** we'll find out ultimately if they're

**[00:01:29]** worth it welcome to the future of

**[00:01:31]** communication this is the tiny and low

**[00:01:33]** power Laura 32 board from htech and it's

**[00:01:36]** a system on a chip designed to do only

**[00:01:38]** two things look cool and send encrypted

**[00:01:41]** messages over long range radio so I

**[00:01:43]** ordered two of these from Amazon and

**[00:01:45]** grabbed two of the coolest cases I could

**[00:01:46]** find in one Laura 32 box you'll get the

**[00:01:48]** following one esp32 Laura OLED board V3

**[00:01:52]** a Laura antenna and a 1.25 mm two Pin

**[00:01:56]** cable they sell them in pairs presumably

**[00:01:58]** so you have someone to talk to and best

**[00:02:00]** bet is to grab these from Amazon or Ebay

**[00:02:02]** and I'll put links in the description

**[00:02:03]** below however the stock antenna on these

**[00:02:05]** things is not very good I'd suggest

**[00:02:08]** upgrading to this whip antenna for

**[00:02:09]** improved signal now let's demystify the

**[00:02:11]** hardware real quick this board is

**[00:02:13]** powered by the esp32 S3 fn8 chip it has

**[00:02:18]** a 1.25 mm battery connector which will

**[00:02:21]** come in handy later as we test its

**[00:02:23]** portability the socket type for the

**[00:02:24]** battery is sh 1.25 X2 it features a USBC

**[00:02:29]** for flashing the firmware and providing

**[00:02:31]** power there are two physical buttons on

**[00:02:33]** this board the reset and user

**[00:02:35]** programming button it also has two LEDs

**[00:02:38]** and a monochromatic OLED screen if you

**[00:02:41]** want to use these on the Move you'll

**[00:02:42]** want to grab a battery be sure to get a

**[00:02:44]** 3.7 volt 4.1 W rechargeable battery with

**[00:02:49]** the correct polarities on the cable

**[00:02:51]** while we're on the subject of power you

**[00:02:52]** might be wondering what the battery life

**[00:02:54]** is for one of these devices and it

**[00:02:56]** varies dramatically based on what

**[00:02:58]** functionality you're using if you're

**[00:03:00]** testing the different capabilities and

**[00:03:02]** actively using everything I think you

**[00:03:04]** can expect around 12 hours but if you

**[00:03:07]** turn off the hungrier features and

**[00:03:08]** reduce send intervals and utilize the

**[00:03:10]** Deep Sleep settings you can probably

**[00:03:12]** extend that quite a bit for anyone

**[00:03:14]** looking to Nest one of these Outdoors

**[00:03:16]** permanently you should be able to use

**[00:03:18]** solar to reup the battery for those

**[00:03:20]** scenarios and here is the power draw

**[00:03:22]** well idle and here is the power draw

**[00:03:24]** while fairly active now I noticed these

**[00:03:27]** really cool 3D printed cases on

**[00:03:29]** printable but since I didn't want to

**[00:03:31]** deal with printing them I went to The

**[00:03:33]** muzy Works laab Etsy store and bought

**[00:03:35]** two cases faster than you can say

**[00:03:37]** impulse by Simon was super helpful and

**[00:03:39]** even sent me some of my favorite kinds

**[00:03:41]** of batteries the free kind he also added

**[00:03:44]** a custom whip antenna upgrade these

**[00:03:46]** cases are pretty much the Tesla of

**[00:03:47]** Gadget housing Sleek smart and probably

**[00:03:50]** too cool for me I'll put the link for

**[00:03:52]** his store in the description below but I

**[00:03:53]** also wanted to see if my PCB

**[00:03:55]** manufacturing buddies over at jlc could

**[00:03:57]** do anything with these schematics since

**[00:04:00]** they have Commercial Printing Machinery

**[00:04:01]** so I sent them the STL files from

**[00:04:03]** printable and they delivered in Spades

**[00:04:06]** they sent back this Phantom black case

**[00:04:08]** featuring a nylon back stop and a super

**[00:04:10]** durable resin front face not bad right

**[00:04:13]** and these things have a Nifty custom

**[00:04:14]** Loop ring for tethers okay so let's get

**[00:04:16]** our Hardware situated in our new cases a

**[00:04:19]** few things to note connecting a Laura

**[00:04:20]** radio without an antenna can cause the

**[00:04:22]** transmitted energy to reflect back into

**[00:04:25]** the device potentially damaging the

**[00:04:27]** radio's transmitter components due to

**[00:04:29]** overheating so make sure the antenna is

**[00:04:31]** attached these antennas snap into place

**[00:04:33]** like so the lower 32 has two

**[00:04:35]** front-facing buttons the left button

**[00:04:38]** Cycles through the information displayed

**[00:04:39]** on the screen and a long press of the

**[00:04:41]** left button will shut down the device

**[00:04:43]** and the right button will reset the

**[00:04:45]** device there are also two LEDs on the

**[00:04:48]** device the blinking white LED will

**[00:04:50]** indicate that the device is on and awake

**[00:04:52]** and the red LED will light up when it's

**[00:04:54]** charging okay so now that the hardware

**[00:04:56]** is set up we want to flash the mesh

**[00:04:57]** tastic firmware to our board this

**[00:05:00]** familiar esp32 based Hardware means we

**[00:05:02]** can tap The Usual Suspects when it comes

**[00:05:05]** to programming Dev environments like

**[00:05:07]** Arduino IDE micropython espressive IDE

**[00:05:11]** should all be compatible but I'd also

**[00:05:13]** note that mesh tastic the open source

**[00:05:15]** software that enables much of this

**[00:05:17]** functionality is built with the tool

**[00:05:19]** platform. and if you want to get your

**[00:05:21]** hands dirty or play around with further

**[00:05:23]** customization you can download the

**[00:05:25]** platform IO plugin for your favorite

**[00:05:27]** code editor I use cursor which is a work

**[00:05:29]** of VSS code that brings gen AI to the

**[00:05:31]** party but if you're just looking to

**[00:05:33]** flash the latest mesh tastic firmware to

**[00:05:34]** your Laura device you actually don't

**[00:05:36]** need any intermediary software okay so

**[00:05:38]** the device doesn't come with the mesh

**[00:05:40]** tastic firmware that's a separate

**[00:05:42]** organization open source project um

**[00:05:45]** historically to get software onto your

**[00:05:47]** microcontrollers you'd have to use

**[00:05:48]** something like Arduino or an IDE or

**[00:05:51]** something like that and what's really

**[00:05:53]** cool is because of the new apis that

**[00:05:56]** Chrome makes available to developers you

**[00:05:58]** can actually connect to USB devices or

**[00:06:01]** USB serial devices as well as Bluetooth

**[00:06:03]** devices and things like that so um what

**[00:06:06]** Mish tastic has done is they've actually

**[00:06:07]** created an application flasher mt.org

**[00:06:10]** where you can get the mesh tastic

**[00:06:12]** firmware onto your device right through

**[00:06:15]** a chromium based browser so this will

**[00:06:17]** work for Chrome Edge Brave Etc so we

**[00:06:21]** just come over to Flasher mesh. org we

**[00:06:24]** select our device and then we select our

**[00:06:26]** firmware version if you want something

**[00:06:28]** more stable you can go here I want the

**[00:06:30]** latest stuff even though it might be a

**[00:06:32]** little buggy so I'm going to do the

**[00:06:33]** latest Alpha and then I'm going to click

**[00:06:36]** flash if you have previous installations

**[00:06:39]** then you might want to do full erase and

**[00:06:41]** install if you want to keep data from

**[00:06:43]** prior installations just keep this

**[00:06:44]** unchecked and that's what I'm going to

**[00:06:45]** do here so I'm just going to go ahead

**[00:06:47]** and click update and it shows all my

**[00:06:51]** devices that are connected um on various

**[00:06:53]** serial ports I am going to use this guy

**[00:06:57]** here it does look like there's two

**[00:06:58]** entries that probably both going to work

**[00:07:01]** but I've had most success with slab USB

**[00:07:04]** to uart if nothing shows up here you

**[00:07:07]** probably have a faulty USB cable you

**[00:07:09]** need a USB cable that can do power and

**[00:07:11]** data uh so we might want to cycle

**[00:07:13]** through a couple cables until um your

**[00:07:16]** device shows up so I'm going to do

**[00:07:17]** connect and then I'm going to just um

**[00:07:19]** well it actually automatically starts

**[00:07:21]** updating and it'll take a couple minutes

**[00:07:22]** if you don't see this going it probably

**[00:07:24]** lost a connection again the connection

**[00:07:26]** is usually the biggest issue the cable

**[00:07:29]** so you might want to try a couple

**[00:07:30]** different adapters a couple different

**[00:07:31]** cables Etc until you get it

**[00:07:35]** working okay and then this stuff's going

**[00:07:37]** to keep logging we can just go ahead and

**[00:07:39]** unplug and we will be all set okay so

**[00:07:42]** you need to run a client with your lower

**[00:07:44]** device so there's always a pair the low

**[00:07:47]** device sends the messages using the

**[00:07:48]** radio it gets on the mesh tastic network

**[00:07:50]** but your client is how you set up the

**[00:07:52]** configuration it's how you type out the

**[00:07:53]** messages how you receive the messages in

**[00:07:55]** many cases um so you can use the Android

**[00:07:59]** app the IOS app chromium based web

**[00:08:01]** browser uh python CLI and they even have

**[00:08:04]** Linux support now uh the iPhone app is

**[00:08:06]** much better than the Android app so

**[00:08:08]** that's what I'm going to use so I'm just

**[00:08:10]** going to go to the App Store and you can

**[00:08:13]** search for mesh tastic you will find the

**[00:08:15]** app here I'm going to go ahead and

**[00:08:17]** download

**[00:08:18]** it let's open that up and then we're

**[00:08:22]** going to start giving it permissions we

**[00:08:24]** do want it to have GPS access we do want

**[00:08:26]** it to have Bluetooth access and no on

**[00:08:29]** the notifications so the device name is

**[00:08:32]** going to be mesh tasticore and then it's

**[00:08:34]** going to be a 4 character truncated

**[00:08:36]** version of the hash ID just so you know

**[00:08:38]** which device you're working with um and

**[00:08:41]** uh if you've connected and reconnected

**[00:08:43]** then you might have to go into your

**[00:08:44]** Bluetooth settings and forget the device

**[00:08:46]** uh in order to reconnect but I think I'm

**[00:08:48]** going to be good here so you know 84 EC

**[00:08:52]** is my hash it says right here A4 EC so I

**[00:08:54]** know that's the right device I'm going

**[00:08:56]** to go ahead and select it and now it's

**[00:08:59]** going to ask me to pair it it's going to

**[00:09:01]** flash a unique code

**[00:09:03]** 998

**[00:09:06]** 389 and we're going to pair it once uh

**[00:09:09]** you only have to do that one time you

**[00:09:10]** will have to keep connecting in the

**[00:09:12]** future but you only have to do that

**[00:09:13]** formal pairing once okay much better so

**[00:09:16]** now we want to configure it and ma'am

**[00:09:18]** there are a lot of settings uh but we

**[00:09:20]** definitely want to give it a region so I

**[00:09:23]** just select um you can go to config and

**[00:09:25]** you can go to Laura and then right here

**[00:09:27]** there's going to be this region section

**[00:09:28]** we definitely want to do United

**[00:09:30]** States um and let's go ahead and save

**[00:09:33]** that now what happens here is when you

**[00:09:35]** make configuration changes uh you have

**[00:09:37]** to save and it will reboot the device in

**[00:09:39]** many cases so like I just set United

**[00:09:42]** States I'm going to go ahead and click

**[00:09:45]** save and it's look watch the device

**[00:09:47]** reboot see and then when it reboots I'm

**[00:09:50]** going to have to reconnect to it so

**[00:09:52]** let's watch that happen

**[00:09:54]** here and it should I think automatically

**[00:09:56]** reconnect yep there it goes and look has

**[00:09:59]** a region now so now uh we are paired

**[00:10:03]** right and so you have your messaging

**[00:10:05]** section here where you can do direct

**[00:10:06]** messages with other devices that are

**[00:10:08]** picked up you have your pairing uh this

**[00:10:11]** is using Bluetooth it could use Wi-Fi

**[00:10:13]** can't use both at the same time that is

**[00:10:15]** um you have other

**[00:10:16]** nodes you have a mesh map but you also

**[00:10:19]** have the configuration settings here so

**[00:10:21]** there's a lot you can do with it um this

**[00:10:23]** guy does not have a GPS but what you

**[00:10:26]** might want to do is uh you can use your

**[00:10:28]** phones GPS so like if you go to app

**[00:10:31]** settings you can select the share

**[00:10:33]** location location use your phone's GPS

**[00:10:36]** to provide location to your node I just

**[00:10:37]** think that's useful because when you

**[00:10:38]** have multiple nodes um you can see how

**[00:10:42]** far away they are I'm going to go ahead

**[00:10:43]** and do share location um you can set the

**[00:10:46]** interval and all that stuff but uh okay

**[00:10:49]** so now it's sharing the

**[00:10:51]** location um let's go down to user uh we

**[00:10:57]** can give it a nice name so let's go in

**[00:11:00]** here so I'm going to call

**[00:11:02]** it um I'm going to call it data Slayer

**[00:11:12]** black okay I'm going to go ahead and

**[00:11:15]** save that again it's probably going to

**[00:11:17]** reboot but then it's going to have a a

**[00:11:19]** more true

**[00:11:23]** name um okay and then so like look if I

**[00:11:27]** go over here yeah data Slayer black um

**[00:11:31]** and other devices will be able to see

**[00:11:33]** that name so I actually have a bunch of

**[00:11:34]** other devices in my vicinity I'm in

**[00:11:36]** Miami here so uh it just automatically

**[00:11:38]** picks up those devices um but let's go

**[00:11:40]** back to settings here let's go to

**[00:11:43]** display um I'm going to turn on this

**[00:11:45]** always Point North on the

**[00:11:47]** compass um display units I'm going to go

**[00:11:50]** to Imperial don't hate me and like now

**[00:11:53]** we can see it's going to use miles and

**[00:11:54]** feet it's talking about distances okay

**[00:11:57]** and I do want to show you the web client

**[00:11:58]** real quick quick so the gist of this is

**[00:12:00]** instead of using the native app on your

**[00:12:02]** phone as the client you can use your

**[00:12:04]** computer's browser your computer's

**[00:12:06]** Chrome based browser so I if I open up

**[00:12:09]** Chrome here and I go to uh client. mesh.

**[00:12:14]** org um this is a remote hosted

**[00:12:18]** application but what it does is it

**[00:12:20]** connects to local devices the

**[00:12:23]** presumption here is that your computer

**[00:12:24]** has either Wi-Fi or Bluetooth and your

**[00:12:27]** mesh tastic device is either emitting

**[00:12:28]** from W Wi-Fi or Bluetooth I'm going to

**[00:12:30]** use Bluetooth here you can see it's

**[00:12:32]** enabled right over here and so what you

**[00:12:34]** have to do is you have to connect and we

**[00:12:36]** can go over to Bluetooth here and again

**[00:12:38]** it can give you Wi-Fi Bluetooth USB

**[00:12:40]** serial if you want to plug it in just do

**[00:12:42]** new device it's going to search for

**[00:12:45]** devices here okay so I found one of my

**[00:12:47]** mesh tastic devices I'm going to go

**[00:12:49]** ahead and click pair let's

**[00:12:53]** see oh and then I just click on it here

**[00:12:56]** okay and there it goes and so you know

**[00:12:58]** it's basically the same as the native

**[00:13:00]** app um you can you can modify the

**[00:13:03]** configurations you can send your

**[00:13:04]** messages so like for instance if I go

**[00:13:06]** over to config these are the basic

**[00:13:08]** device configurations and then they call

**[00:13:11]** uh these extra modules like mqtt and the

**[00:13:13]** range test uh they call this uh module

**[00:13:16]** configurations okay so this is how these

**[00:13:18]** things work each of the Mish tastic

**[00:13:20]** devices should be connected to a client

**[00:13:23]** and it can be connected to a client over

**[00:13:26]** Bluetooth USB seral or Wi-Fi I usually

**[00:13:30]** use Bluetooth so you know if if these

**[00:13:32]** two individuals were say hiking together

**[00:13:35]** and they diverged it's okay if they

**[00:13:38]** don't have cellular service anymore or

**[00:13:40]** satellite or Internet or GPS or anything

**[00:13:42]** like that as long as they have a close

**[00:13:45]** proximity uh Wi-Fi capability or a Clos

**[00:13:48]** proximity Bluetooth capability and can

**[00:13:50]** connect to this this will these will do

**[00:13:52]** the heavy lifting of sending the

**[00:13:53]** messages several miles in some cases uh

**[00:13:56]** using Laura and so let's send some

**[00:13:58]** messages is real quick within close

**[00:14:00]** proximity so if I open up my phone here

**[00:14:04]** and I go over to mes tastic um let's see

**[00:14:09]** here okay so I'm going so let me turn

**[00:14:11]** this on

**[00:14:13]** first and then the radio should connect

**[00:14:16]** and then okay there it goes and I'm

**[00:14:17]** going to do the same thing over here

**[00:14:31]** okay so um both of them are connected

**[00:14:34]** you see this node here this is what this

**[00:14:36]** looks like when this is connected so I'm

**[00:14:38]** going to send a message from here to

**[00:14:40]** here and show you what happens so again

**[00:14:41]** you can't type on this thing right um so

**[00:14:43]** you come over here and you can create a

**[00:14:46]** channel that you can talk on or you can

**[00:14:49]** send direct messages to uh different

**[00:14:52]** nodes so like if I wanted to send a

**[00:14:53]** message to data Slayer green go to

**[00:14:55]** direct messages kill that all right data

**[00:14:58]** Slayer layer

**[00:14:59]** green and I can

**[00:15:05]** say Yeah so basically instantly that

**[00:15:08]** message came up here so okay so that's

**[00:15:10]** you know I just sent a message from here

**[00:15:12]** to here and then I could do the same

**[00:15:13]** thing over here the app's not quite as

**[00:15:17]** good

**[00:15:18]** but I can do

**[00:15:22]** aoy see so it shows up on the app and it

**[00:15:25]** also shows up on the um

**[00:15:29]** shows up on the device here okay so

**[00:15:31]** that's that's sending messages um and

**[00:15:34]** because we enabled uh

**[00:15:36]** GPS these things should be able to

**[00:15:38]** determine uh where they are in relation

**[00:15:40]** to each other so if I toggle through the

**[00:15:43]** available nodes here let's

**[00:15:46]** see

**[00:15:48]** uh See data Slayer green 159 fet away

**[00:15:51]** obviously like the GPS isn't perfect but

**[00:15:53]** as you move more significant distances

**[00:15:55]** it will be able to get a good read there

**[00:15:57]** and you'll see I mean some cases I was

**[00:15:59]** able to see it was 3 miles apart um and

**[00:16:01]** then this this Compass thing here uh

**[00:16:05]** people have had issues with it it uses

**[00:16:06]** something called dead reckoning so

**[00:16:08]** basically if you're on the move and you

**[00:16:09]** have GPS enabled then it will try to uh

**[00:16:13]** determine where you are in relation to

**[00:16:15]** True North and it also will give you a

**[00:16:18]** heading and It'll point to other nodes

**[00:16:20]** in some cases um and again though people

**[00:16:23]** have gotten varying degrees of utility

**[00:16:25]** out out of that so if it's more

**[00:16:27]** confusing than it is helpful you can

**[00:16:28]** just turn that off okay something you're

**[00:16:30]** probably going to want to do is a range

**[00:16:31]** test technically you could continually

**[00:16:34]** just send messages and then see when the

**[00:16:37]** messages stop sending and then that's

**[00:16:38]** your range but the problem is um when

**[00:16:41]** you're conducting the range test uh a

**[00:16:43]** lot of the messages won't get through

**[00:16:45]** and so what the range test does is it

**[00:16:46]** will keep sending uh new messages every

**[00:16:50]** specified interval like 30 seconds or so

**[00:16:53]** and it will um increment a counter so

**[00:16:55]** you can kind of figure out from there

**[00:16:57]** you know what messages you're getting

**[00:16:58]** and which ones you're not getting and

**[00:17:00]** you don't have to worry about keep

**[00:17:01]** sending messages which gets annoying so

**[00:17:03]** in order to do that you need to enable

**[00:17:04]** range test on both devices and then you

**[00:17:07]** would go your separate ways and you

**[00:17:09]** would see how far you can go um while

**[00:17:11]** still getting messages so the way you do

**[00:17:13]** that is you go to config you go to uh

**[00:17:16]** modules or settings it's different based

**[00:17:18]** on what app you're using you go to range

**[00:17:21]** test right here and you enable it and

**[00:17:25]** then you can go to the interval you I'll

**[00:17:28]** do every

**[00:17:29]** 15 seconds and then you just go ahead

**[00:17:32]** and save that it's going to reboot and

**[00:17:35]** then you do the same thing on your other

**[00:17:36]** device so if you go to Radio

**[00:17:39]** configuration range

**[00:17:41]** test enabled 15

**[00:17:44]** seconds and then that should reboot and

**[00:17:48]** then it'll start sending

**[00:17:49]** messages with the prefix seq for

**[00:17:53]** sequence and then the counter the

**[00:17:55]** increment okay so I got my first message

**[00:17:57]** already

**[00:17:59]** seq1 and we should just see seq2 right

**[00:18:04]** and so what you can do is as you get

**[00:18:07]** these messages you can flip over to

**[00:18:09]** nodes like say I get a sequence 3 and

**[00:18:11]** I'm walking away right I can then go

**[00:18:13]** over to nodes and then I can go to the

**[00:18:15]** other um node that I'm that I'm working

**[00:18:18]** with here and I can

**[00:18:21]** actually uh let's see okay it doesn't

**[00:18:23]** show the distance right there but it

**[00:18:24]** does right here see 200 feet away and I

**[00:18:26]** actually did a test like this where I

**[00:18:28]** put the um I put one of them in the

**[00:18:31]** window in my building and my building's

**[00:18:33]** you know fairly high and I went out to

**[00:18:35]** like an island that was like 3 and2

**[00:18:37]** miles away and I actually got a message

**[00:18:39]** through at 3 and 1/2 miles which was

**[00:18:41]** pretty cool you know line of sight is

**[00:18:43]** important but I will say even in the

**[00:18:45]** urban area that I'm in if I stayed

**[00:18:47]** within a mile it would get messages even

**[00:18:50]** if there were like you know buildings in

**[00:18:52]** the way and things like that so I'm not

**[00:18:53]** convinced that's the only thing that

**[00:18:55]** matters uh but then beyond that there's

**[00:18:57]** different uh Network pre presets right

**[00:18:59]** like um you could do different megahertz

**[00:19:02]** and some have higher data rates some

**[00:19:04]** have lower data rates higher distance

**[00:19:05]** things like that when it comes to the um

**[00:19:09]** the Laura settings the gist of uh how it

**[00:19:12]** works is the trade-off is between uh

**[00:19:15]** throughput so like high data and then

**[00:19:18]** distance so something like WiFi is uh

**[00:19:23]** low distance right it's within the order

**[00:19:24]** of like 100 ft but it's high data high

**[00:19:27]** throughput you can send a lot of

**[00:19:29]** information what Laura is is it's low

**[00:19:32]** data so you can't send you know Rich um

**[00:19:35]** you know heavy packets of data but you

**[00:19:38]** can send them long

**[00:19:40]** distances um so that's like the basic

**[00:19:42]** just but they're both radio waves they

**[00:19:43]** use you know the same technology

**[00:19:45]** essentially but then from here they give

**[00:19:46]** you other presets and they try to

**[00:19:48]** describe what the presets have but at

**[00:19:50]** the end of the day most people say to

**[00:19:51]** just use a default settings long fast

**[00:19:53]** and the reason is because if you want to

**[00:19:55]** pick up on other nodes they need to be

**[00:19:56]** on those same uh frequencies SE the same

**[00:19:59]** wavelengths okay so one thing you might

**[00:20:01]** want to do is create your own encrypted

**[00:20:03]** channel so let's go ahead and do that so

**[00:20:06]** if you go to settings and then you go to

**[00:20:09]** channels and then you go to add

**[00:20:17]** Channel let's see

**[00:20:23]** private private chat default

**[00:20:30]** all right there it

**[00:20:31]** goes and so and then to get it onto my

**[00:20:34]** other device to get the private key over

**[00:20:36]** there you go to

**[00:20:39]** settings you go to share QR I'm going to

**[00:20:43]** kill all

**[00:20:45]** these and then what I'm going to do is

**[00:20:47]** open up the camera over here right and

**[00:20:51]** then it's going to open up that local

**[00:20:53]** link it's going to ask you to

**[00:20:56]** accept and now private chat is here so

**[00:21:00]** what I can do is I can say

**[00:21:04]** testing send that

**[00:21:07]** through let's

**[00:21:09]** see okay so it finally worked so

**[00:21:12]** creating those private channels is um a

**[00:21:15]** little

**[00:21:16]** tricky but um if you just test it out I

**[00:21:20]** think you should be good let's see yeah

**[00:21:23]** okay and so what this channel is

**[00:21:24]** encrypted right so anyone who inter

**[00:21:25]** intercepts like the radio signal um is

**[00:21:28]** only going to get encrypted messages um

**[00:21:31]** encrypted um data so your Communications

**[00:21:34]** are going to be private in those cases

**[00:21:36]** okay so now for the range test I

**[00:21:38]** conducted four distinct types of tests

**[00:21:41]** using a number of different settings and

**[00:21:43]** parameters and uh locations and I want

**[00:21:46]** to talk about what worked best for me so

**[00:21:49]** for the first test I did I live on the

**[00:21:51]** 32th floor of a high-rise building and

**[00:21:55]** so what I did was for one of the nodes I

**[00:21:58]** I uh set it on my balcony and um I went

**[00:22:02]** out about 1,000 ft uh with a direct line

**[00:22:05]** of sight and for this test I was using

**[00:22:09]** the default long fast uh frequency and I

**[00:22:13]** used one stub antenna and one whip

**[00:22:16]** antenna and that worked pretty well

**[00:22:18]** those messages came through just fine

**[00:22:21]** okay so for the second test I conducted

**[00:22:23]** both of the nodes were at the beach so

**[00:22:25]** they were both at ground level there was

**[00:22:27]** really no promise Min or elevation of

**[00:22:29]** either nodes all right so we have a

**[00:22:31]** connection right now the connection is

**[00:22:35]** it says 80% we're going to keep just

**[00:22:37]** sending messages

**[00:22:40]** until we no longer

**[00:22:43]** have uh a connection a signal so let's

**[00:22:48]** go again I was using the long fast

**[00:22:51]** frequency and I was using two stub

**[00:22:53]** antennas and I was actually pretty

**[00:22:55]** surprised that I wasn't able to get any

**[00:22:58]** more than about 500 ft of distance

**[00:23:01]** before the messages stopped going

**[00:23:03]** through so these stub antennas just

**[00:23:06]** aren't that great or they can be hit or

**[00:23:09]** miss okay so for the third test I did um

**[00:23:12]** I did a direct line of sight test we did

**[00:23:15]** about one mile so we're going to run a

**[00:23:18]** um a range test we got node operator one

**[00:23:21]** right here and I'm going to be

**[00:23:23]** out there running the second node and

**[00:23:27]** we're going to see what we get terms of

**[00:23:30]** uh con activity so we'll see we were

**[00:23:33]** using long fast both devices were using

**[00:23:36]** the stub antenna but one of the devices

**[00:23:39]** I put on my drone and I elevated it to

**[00:23:41]** probably about 100 ft again though uh no

**[00:23:45]** signal was able to get through so I was

**[00:23:47]** pretty surprised by that cuz I had a

**[00:23:48]** direct line of sight and uh these things

**[00:23:51]** are rated at those types of distances so

**[00:23:53]** I thought that would get through I

**[00:23:55]** attribute it to the uh stub antenna okay

**[00:23:58]** so for the final test I put the first

**[00:24:00]** node in the window on the 32nd Floor in

**[00:24:03]** my apartment so it was quite elevated

**[00:24:06]** had a good bit of prominence and I also

**[00:24:08]** put the whip antenna on that node uh for

**[00:24:11]** better power but I also changed the

**[00:24:14]** preset I changed the frequency from long

**[00:24:16]** fast to very long slow so the trade-off

**[00:24:20]** there is the data transmission is lower

**[00:24:23]** the throughput is lower but in theory

**[00:24:25]** the distance might be greater so I was

**[00:24:28]** on that um different frequency and then

**[00:24:31]** for the other node uh I again I used the

**[00:24:34]** stub antenna and I went out around uh on

**[00:24:38]** a sort of peninsula near where I live

**[00:24:41]** and I just let the range test keep going

**[00:24:44]** and I got messages at a couple miles but

**[00:24:47]** then I continued to get messages all the

**[00:24:49]** way up to about 3 and 1/2 miles so what

**[00:24:52]** I would just call out there is the first

**[00:24:55]** node had the whip antenna it was

**[00:24:57]** elevated quite a bit on the 32nd Floor

**[00:24:59]** and it had basically a direct line of

**[00:25:02]** sight with no obstruction all the way

**[00:25:04]** out to where I was uh 3 and 1 half miles

**[00:25:08]** away now not every single message got

**[00:25:10]** through so it wasn't like a perfect

**[00:25:11]** connectivity but um when the messages

**[00:25:14]** did get through it caught up and sent

**[00:25:16]** all the messages that uh didn't make it

**[00:25:18]** through so uh it was a true range test

**[00:25:21]** and it worked pretty well um so you know

**[00:25:24]** I was pretty happy with that what I

**[00:25:25]** think might help even more though is if

**[00:25:27]** on that second node I also had a better

**[00:25:29]** antenna than just the stub antenna I

**[00:25:32]** could probably get even more distance so

**[00:25:35]** these things are probably not going to

**[00:25:37]** replace my phone provider but it might

**[00:25:39]** be the start of something new imagine

**[00:25:41]** transforming the way we communicate by

**[00:25:43]** merging the Simplicity of walkie-talkies

**[00:25:45]** with the power of modern technology and

**[00:25:48]** that's exactly what these devices do

**[00:25:50]** they're not just any communication tool

**[00:25:52]** they are Advanced text based

**[00:25:54]** walkie-talkies that Empower you to send

**[00:25:56]** encrypted messages over long distance es

**[00:25:58]** using radio waves this Cutting Edge

**[00:26:01]** feature bypasses the need for

**[00:26:02]** traditional Telecom networks shielding

**[00:26:05]** your Transmissions from potential

**[00:26:07]** eavesdropping by big telecom companies

**[00:26:09]** with these devices you're not just

**[00:26:11]** communicating you're taking a bold step

**[00:26:12]** towards privacy and freedom in your

**[00:26:15]** conversations whether you're

**[00:26:16]** coordinating with a team in remote

**[00:26:17]** locations or setting up a secure channel

**[00:26:19]** for personal communication these devices

**[00:26:22]** offer a powerful alternative to

**[00:26:24]** Conventional methods ensuring your

**[00:26:26]** messages remain confidential and and

**[00:26:28]** most importantly yours

# Full Text (without timestamps)

move over flipper zero because there's a new tech darling in town it's called mesh tastic and it promises to bring us an off-grid decentralized comms Network that's entirely open source and outside the control of Big Brother best of all it runs for free on Tiny affordable and low powerered radios sporting esp32 microcontrollers but besides looking really cool and getting me to empty my wallet what can these things actually do well think text-based walkie-talkies enabling you to send encrypted messages over long range radio AKA Laura this novel application Shields your Transmissions from potential wiretapping by big telecommunication companies ensuring your messages remain confidential and most importantly yours but it goes even deeper there are a number of scenarios today where traditional cellular networks fail for instance Urban festivals and Gatherings where the cell network is saturated like New Year's Eve in Time Square overlanding or other remote adventure activities in isolated areas like deserts also overseas traveling if you don't have roaming or a local Sim and NGO work in places without cell infrastructure we'll also cover the most common pitfalls enthusiasts make and how to correct those finally I'm taking this Innovation to new heights literally by outfitting my drone with one of these groundbreaking devices to conduct an epic range test to see how far these things can actually go by the end of this video you'll thoroughly appreciate the unique Freedom that these powerful mini Mish tastic devices provide and we'll find out ultimately if they're worth it welcome to the future of communication this is the tiny and low power Laura 32 board from htech and it's a system on a chip designed to do only two things look cool and send encrypted messages over long range radio so I ordered two of these from Amazon and grabbed two of the coolest cases I could find in one Laura 32 box you'll get the following one esp32 Laura OLED board V3 a Laura antenna and a 1.25 mm two Pin cable they sell them in pairs presumably so you have someone to talk to and best bet is to grab these from Amazon or Ebay and I'll put links in the description below however the stock antenna on these things is not very good I'd suggest upgrading to this whip antenna for improved signal now let's demystify the hardware real quick this board is powered by the esp32 S3 fn8 chip it has a 1.25 mm battery connector which will come in handy later as we test its portability the socket type for the battery is sh 1.25 X2 it features a USBC for flashing the firmware and providing power there are two physical buttons on this board the reset and user programming button it also has two LEDs and a monochromatic OLED screen if you want to use these on the Move you'll want to grab a battery be sure to get a 3.7 volt 4.1 W rechargeable battery with the correct polarities on the cable while we're on the subject of power you might be wondering what the battery life is for one of these devices and it varies dramatically based on what functionality you're using if you're testing the different capabilities and actively using everything I think you can expect around 12 hours but if you turn off the hungrier features and reduce send intervals and utilize the Deep Sleep settings you can probably extend that quite a bit for anyone looking to Nest one of these Outdoors permanently you should be able to use solar to reup the battery for those scenarios and here is the power draw well idle and here is the power draw while fairly active now I noticed these really cool 3D printed cases on printable but since I didn't want to deal with printing them I went to The muzy Works laab Etsy store and bought two cases faster than you can say impulse by Simon was super helpful and even sent me some of my favorite kinds of batteries the free kind he also added a custom whip antenna upgrade these cases are pretty much the Tesla of Gadget housing Sleek smart and probably too cool for me I'll put the link for his store in the description below but I also wanted to see if my PCB manufacturing buddies over at jlc could do anything with these schematics since they have Commercial Printing Machinery so I sent them the STL files from printable and they delivered in Spades they sent back this Phantom black case featuring a nylon back stop and a super durable resin front face not bad right and these things have a Nifty custom Loop ring for tethers okay so let's get our Hardware situated in our new cases a few things to note connecting a Laura radio without an antenna can cause the transmitted energy to reflect back into the device potentially damaging the radio's transmitter components due to overheating so make sure the antenna is attached these antennas snap into place like so the lower 32 has two front-facing buttons the left button Cycles through the information displayed on the screen and a long press of the left button will shut down the device and the right button will reset the device there are also two LEDs on the device the blinking white LED will indicate that the device is on and awake and the red LED will light up when it's charging okay so now that the hardware is set up we want to flash the mesh tastic firmware to our board this familiar esp32 based Hardware means we can tap The Usual Suspects when it comes to programming Dev environments like Arduino IDE micropython espressive IDE should all be compatible but I'd also note that mesh tastic the open source software that enables much of this functionality is built with the tool platform. and if you want to get your hands dirty or play around with further customization you can download the platform IO plugin for your favorite code editor I use cursor which is a work of VSS code that brings gen AI to the party but if you're just looking to flash the latest mesh tastic firmware to your Laura device you actually don't need any intermediary software okay so the device doesn't come with the mesh tastic firmware that's a separate organization open source project um historically to get software onto your microcontrollers you'd have to use something like Arduino or an IDE or something like that and what's really cool is because of the new apis that Chrome makes available to developers you can actually connect to USB devices or USB serial devices as well as Bluetooth devices and things like that so um what Mish tastic has done is they've actually created an application flasher mt.org where you can get the mesh tastic firmware onto your device right through a chromium based browser so this will work for Chrome Edge Brave Etc so we just come over to Flasher mesh. org we select our device and then we select our firmware version if you want something more stable you can go here I want the latest stuff even though it might be a little buggy so I'm going to do the latest Alpha and then I'm going to click flash if you have previous installations then you might want to do full erase and install if you want to keep data from prior installations just keep this unchecked and that's what I'm going to do here so I'm just going to go ahead and click update and it shows all my devices that are connected um on various serial ports I am going to use this guy here it does look like there's two entries that probably both going to work but I've had most success with slab USB to uart if nothing shows up here you probably have a faulty USB cable you need a USB cable that can do power and data uh so we might want to cycle through a couple cables until um your device shows up so I'm going to do connect and then I'm going to just um well it actually automatically starts updating and it'll take a couple minutes if you don't see this going it probably lost a connection again the connection is usually the biggest issue the cable so you might want to try a couple different adapters a couple different cables Etc until you get it working okay and then this stuff's going to keep logging we can just go ahead and unplug and we will be all set okay so you need to run a client with your lower device so there's always a pair the low device sends the messages using the radio it gets on the mesh tastic network but your client is how you set up the configuration it's how you type out the messages how you receive the messages in many cases um so you can use the Android app the IOS app chromium based web browser uh python CLI and they even have Linux support now uh the iPhone app is much better than the Android app so that's what I'm going to use so I'm just going to go to the App Store and you can search for mesh tastic you will find the app here I'm going to go ahead and download it let's open that up and then we're going to start giving it permissions we do want it to have GPS access we do want it to have Bluetooth access and no on the notifications so the device name is going to be mesh tasticore and then it's going to be a 4 character truncated version of the hash ID just so you know which device you're working with um and uh if you've connected and reconnected then you might have to go into your Bluetooth settings and forget the device uh in order to reconnect but I think I'm going to be good here so you know 84 EC is my hash it says right here A4 EC so I know that's the right device I'm going to go ahead and select it and now it's going to ask me to pair it it's going to flash a unique code 998 389 and we're going to pair it once uh you only have to do that one time you will have to keep connecting in the future but you only have to do that formal pairing once okay much better so now we want to configure it and ma'am there are a lot of settings uh but we definitely want to give it a region so I just select um you can go to config and you can go to Laura and then right here there's going to be this region section we definitely want to do United States um and let's go ahead and save that now what happens here is when you make configuration changes uh you have to save and it will reboot the device in many cases so like I just set United States I'm going to go ahead and click save and it's look watch the device reboot see and then when it reboots I'm going to have to reconnect to it so let's watch that happen here and it should I think automatically reconnect yep there it goes and look has a region now so now uh we are paired right and so you have your messaging section here where you can do direct messages with other devices that are picked up you have your pairing uh this is using Bluetooth it could use Wi-Fi can't use both at the same time that is um you have other nodes you have a mesh map but you also have the configuration settings here so there's a lot you can do with it um this guy does not have a GPS but what you might want to do is uh you can use your phones GPS so like if you go to app settings you can select the share location location use your phone's GPS to provide location to your node I just think that's useful because when you have multiple nodes um you can see how far away they are I'm going to go ahead and do share location um you can set the interval and all that stuff but uh okay so now it's sharing the location um let's go down to user uh we can give it a nice name so let's go in here so I'm going to call it um I'm going to call it data Slayer black okay I'm going to go ahead and save that again it's probably going to reboot but then it's going to have a a more true name um okay and then so like look if I go over here yeah data Slayer black um and other devices will be able to see that name so I actually have a bunch of other devices in my vicinity I'm in Miami here so uh it just automatically picks up those devices um but let's go back to settings here let's go to display um I'm going to turn on this always Point North on the compass um display units I'm going to go to Imperial don't hate me and like now we can see it's going to use miles and feet it's talking about distances okay and I do want to show you the web client real quick quick so the gist of this is instead of using the native app on your phone as the client you can use your computer's browser your computer's Chrome based browser so I if I open up Chrome here and I go to uh client. mesh. org um this is a remote hosted application but what it does is it connects to local devices the presumption here is that your computer has either Wi-Fi or Bluetooth and your mesh tastic device is either emitting from W Wi-Fi or Bluetooth I'm going to use Bluetooth here you can see it's enabled right over here and so what you have to do is you have to connect and we can go over to Bluetooth here and again it can give you Wi-Fi Bluetooth USB serial if you want to plug it in just do new device it's going to search for devices here okay so I found one of my mesh tastic devices I'm going to go ahead and click pair let's see oh and then I just click on it here okay and there it goes and so you know it's basically the same as the native app um you can you can modify the configurations you can send your messages so like for instance if I go over to config these are the basic device configurations and then they call uh these extra modules like mqtt and the range test uh they call this uh module configurations okay so this is how these things work each of the Mish tastic devices should be connected to a client and it can be connected to a client over Bluetooth USB seral or Wi-Fi I usually use Bluetooth so you know if if these two individuals were say hiking together and they diverged it's okay if they don't have cellular service anymore or satellite or Internet or GPS or anything like that as long as they have a close proximity uh Wi-Fi capability or a Clos proximity Bluetooth capability and can connect to this this will these will do the heavy lifting of sending the messages several miles in some cases uh using Laura and so let's send some messages is real quick within close proximity so if I open up my phone here and I go over to mes tastic um let's see here okay so I'm going so let me turn this on first and then the radio should connect and then okay there it goes and I'm going to do the same thing over here okay so um both of them are connected you see this node here this is what this looks like when this is connected so I'm going to send a message from here to here and show you what happens so again you can't type on this thing right um so you come over here and you can create a channel that you can talk on or you can send direct messages to uh different nodes so like if I wanted to send a message to data Slayer green go to direct messages kill that all right data Slayer layer green and I can say Yeah so basically instantly that message came up here so okay so that's you know I just sent a message from here to here and then I could do the same thing over here the app's not quite as good but I can do aoy see so it shows up on the app and it also shows up on the um shows up on the device here okay so that's that's sending messages um and because we enabled uh GPS these things should be able to determine uh where they are in relation to each other so if I toggle through the available nodes here let's see uh See data Slayer green 159 fet away obviously like the GPS isn't perfect but as you move more significant distances it will be able to get a good read there and you'll see I mean some cases I was able to see it was 3 miles apart um and then this this Compass thing here uh people have had issues with it it uses something called dead reckoning so basically if you're on the move and you have GPS enabled then it will try to uh determine where you are in relation to True North and it also will give you a heading and It'll point to other nodes in some cases um and again though people have gotten varying degrees of utility out out of that so if it's more confusing than it is helpful you can just turn that off okay something you're probably going to want to do is a range test technically you could continually just send messages and then see when the messages stop sending and then that's your range but the problem is um when you're conducting the range test uh a lot of the messages won't get through and so what the range test does is it will keep sending uh new messages every specified interval like 30 seconds or so and it will um increment a counter so you can kind of figure out from there you know what messages you're getting and which ones you're not getting and you don't have to worry about keep sending messages which gets annoying so in order to do that you need to enable range test on both devices and then you would go your separate ways and you would see how far you can go um while still getting messages so the way you do that is you go to config you go to uh modules or settings it's different based on what app you're using you go to range test right here and you enable it and then you can go to the interval you I'll do every 15 seconds and then you just go ahead and save that it's going to reboot and then you do the same thing on your other device so if you go to Radio configuration range test enabled 15 seconds and then that should reboot and then it'll start sending messages with the prefix seq for sequence and then the counter the increment okay so I got my first message already seq1 and we should just see seq2 right and so what you can do is as you get these messages you can flip over to nodes like say I get a sequence 3 and I'm walking away right I can then go over to nodes and then I can go to the other um node that I'm that I'm working with here and I can actually uh let's see okay it doesn't show the distance right there but it does right here see 200 feet away and I actually did a test like this where I put the um I put one of them in the window in my building and my building's you know fairly high and I went out to like an island that was like 3 and2 miles away and I actually got a message through at 3 and 1/2 miles which was pretty cool you know line of sight is important but I will say even in the urban area that I'm in if I stayed within a mile it would get messages even if there were like you know buildings in the way and things like that so I'm not convinced that's the only thing that matters uh but then beyond that there's different uh Network pre presets right like um you could do different megahertz and some have higher data rates some have lower data rates higher distance things like that when it comes to the um the Laura settings the gist of uh how it works is the trade-off is between uh throughput so like high data and then distance so something like WiFi is uh low distance right it's within the order of like 100 ft but it's high data high throughput you can send a lot of information what Laura is is it's low data so you can't send you know Rich um you know heavy packets of data but you can send them long distances um so that's like the basic just but they're both radio waves they use you know the same technology essentially but then from here they give you other presets and they try to describe what the presets have but at the end of the day most people say to just use a default settings long fast and the reason is because if you want to pick up on other nodes they need to be on those same uh frequencies SE the same wavelengths okay so one thing you might want to do is create your own encrypted channel so let's go ahead and do that so if you go to settings and then you go to channels and then you go to add Channel let's see private private chat default all right there it goes and so and then to get it onto my other device to get the private key over there you go to settings you go to share QR I'm going to kill all these and then what I'm going to do is open up the camera over here right and then it's going to open up that local link it's going to ask you to accept and now private chat is here so what I can do is I can say testing send that through let's see okay so it finally worked so creating those private channels is um a little tricky but um if you just test it out I think you should be good let's see yeah okay and so what this channel is encrypted right so anyone who inter intercepts like the radio signal um is only going to get encrypted messages um encrypted um data so your Communications are going to be private in those cases okay so now for the range test I conducted four distinct types of tests using a number of different settings and parameters and uh locations and I want to talk about what worked best for me so for the first test I did I live on the 32th floor of a high-rise building and so what I did was for one of the nodes I I uh set it on my balcony and um I went out about 1,000 ft uh with a direct line of sight and for this test I was using the default long fast uh frequency and I used one stub antenna and one whip antenna and that worked pretty well those messages came through just fine okay so for the second test I conducted both of the nodes were at the beach so they were both at ground level there was really no promise Min or elevation of either nodes all right so we have a connection right now the connection is it says 80% we're going to keep just sending messages until we no longer have uh a connection a signal so let's go again I was using the long fast frequency and I was using two stub antennas and I was actually pretty surprised that I wasn't able to get any more than about 500 ft of distance before the messages stopped going through so these stub antennas just aren't that great or they can be hit or miss okay so for the third test I did um I did a direct line of sight test we did about one mile so we're going to run a um a range test we got node operator one right here and I'm going to be out there running the second node and we're going to see what we get terms of uh con activity so we'll see we were using long fast both devices were using the stub antenna but one of the devices I put on my drone and I elevated it to probably about 100 ft again though uh no signal was able to get through so I was pretty surprised by that cuz I had a direct line of sight and uh these things are rated at those types of distances so I thought that would get through I attribute it to the uh stub antenna okay so for the final test I put the first node in the window on the 32nd Floor in my apartment so it was quite elevated had a good bit of prominence and I also put the whip antenna on that node uh for better power but I also changed the preset I changed the frequency from long fast to very long slow so the trade-off there is the data transmission is lower the throughput is lower but in theory the distance might be greater so I was on that um different frequency and then for the other node uh I again I used the stub antenna and I went out around uh on a sort of peninsula near where I live and I just let the range test keep going and I got messages at a couple miles but then I continued to get messages all the way up to about 3 and 1/2 miles so what I would just call out there is the first node had the whip antenna it was elevated quite a bit on the 32nd Floor and it had basically a direct line of sight with no obstruction all the way out to where I was uh 3 and 1 half miles away now not every single message got through so it wasn't like a perfect connectivity but um when the messages did get through it caught up and sent all the messages that uh didn't make it through so uh it was a true range test and it worked pretty well um so you know I was pretty happy with that what I think might help even more though is if on that second node I also had a better antenna than just the stub antenna I could probably get even more distance so these things are probably not going to replace my phone provider but it might be the start of something new imagine transforming the way we communicate by merging the Simplicity of walkie-talkies with the power of modern technology and that's exactly what these devices do they're not just any communication tool they are Advanced text based walkie-talkies that Empower you to send encrypted messages over long distance es using radio waves this Cutting Edge feature bypasses the need for traditional Telecom networks shielding your Transmissions from potential eavesdropping by big telecom companies with these devices you're not just communicating you're taking a bold step towards privacy and freedom in your conversations whether you're coordinating with a team in remote locations or setting up a secure channel for personal communication these devices offer a powerful alternative to Conventional methods ensuring your messages remain confidential and and most importantly yours