Lesson Text Identification
PART 1
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Keywords (use Crtl and the F key to bring up the search box)

Chip bit pin eeprom data ecu emulator byte read zeros reader called functions put hexadecimal unit number processes array

PART 1
20:44
Okay, I think we're all in the house, men.

20:54
Some quick I'm just gonna have a quick look down through the chat Susan.

21:00
Gordon James right. How are you? Good. Cuz you did a live recording. Got the same one I stripped it last night. Well, good stuff.

21:11

took me about an hour when we heat gun though. Yeah.

21:14
Yeah.

21:17
It's a lot of work to get them apartment.

21:21
policy. Which one was it wrong what DC was it in EDC 16 A for BMW? Oh yeah. Yeah, it looks exactly the same as in your pictures. You're in the video. Yep. So just wanna Yeah, the interesting stuff. So broken one. Yeah. You can bench you can bench the the EEPROM lives on the underside. Otherwise, you have to take the you have to take the board out of the case. You know, you have to break the heat shrink both sides. So the bottom tray with the six screws comes off and then you have to try and release it from the upper case.

21:54
That was the hardest bit getting it to heat because the heat gun kit.

21:57
I don't know if it's got a temperature Just set in or or something because it is out there enough to give it five minutes and then come back to it so I might need more heat mm hmm no good stuff that's really good yeah get another practice that's the thing man This makes perfect

22:18
yeah good stuff

22:23
Yeah, there's a heat so Richards just asked a question in the chat then morning Keith could see them or Tim and Richard was asked to chat there there is some heat transfer paste that you can get it's very mucky stuff well minded to do is just pull those some few bits together in and put them in the in the discussion group with some part numbers because um, yeah, you can you can tell me what reminds you of Richard back in the olden days for people that are old enough to remember when we used to replace amplifiers inside them distributors and it's In a conductive paste that essentially breaches any air gaps because the air as an insulator for heat transfer and it will cause the components to overheat so there's you know commercially available heat paste that you can you can apply as you reassemble your I'm sure you can also buy the adhesive if you want to put that back in the link to both versions of them the heat

23:23
paste yeah

23:28

yeah, it was made a good point there if you run if you do try and use a screwdriver to get the case up you a lot of the board love the boards have them components near the edge. So let me just was swapped the video over here and then just the other. I've got an overhead video in the classroom today, but I've got a video and this is the board that I pulled the edge connector off. So when I said yesterday, last week that Tuesday, Thursday blast. This is the ECU I pull the edge connector off just using that chip quick Standard soldering iron. And what you can see here, I sort of come across it. So I thought I'd show you that this is a piece of work just to try and prove that technique because there are lots of sceptics out there who say, you know that you need some specialist gear and you need another neat, you need infrared, but I pulled the pull the edge connector off that without any damage to any of the components. There are pretty significant resistors that live next to the pins, so you can imagine that's a full room. So that's exactly the same issues we were looking at with the edge Connect remove. David made a good point there. But if you This is obviously normally goes this way. So your casing is here and this is the bit you can get to as you start leaving off. It's very easy to slip and knock some small components off. So there are minor components right near to the edges there. So you have to be real careful that you don't, you don't get the edges knocked off. That's coming to focus. They're

24:58
coming in and coming out. Okay, there you go. Yeah

25:03
it's easy to damage your cup yeah cup outside heater so much just said there yeah

25:11
they're easy to do much cut and heat outside see them at the same time. Yeah,

25:16
it's a

25:18
I think Dave

25:21
Dave Hopkins made a good point about the you know, having some some solvent put inside the case, hadn't really leaving it giving yourself enough time. You know, for the solvent to work. Definitely makes it a much easier job. It's one of those things you can't really rush you're just going to take as long as it takes and as long as you're not rushing, the car is not sat in the waiting room and you know, it should be fine. You'll also find, as Ryan has done there, get getting through a couple of these. The scrap is definitely the way to go. I showed you my bin of scrapped ones on Thursday, and really practice makes perfect And it's all of those things, case manipulation, and getting the covers off. Jay, we mentioned also from magic motorsport there, they do case extractors which are basically take the screws out, then you put these things in, it pulls the base plate off, which are quite nice. There are some plasticized tools, which I've seen all sorts of use from toothbrushes, which essentially, when you get the bottle case off to get the top case off, you can try and try and wedge them in

from either side to give you a sort of a wedge to go under the board between the case to lift it off as you go through. But it's a case of patience and perseverance and probably damaging a couple just to get yourself so you know where the boundaries are. So you know how far you can push that stuff. Yeah, no, no time pressure and a bit of practice. The more you do, yeah, the better you'll be.

26:53
So yeah, good stuff.

26:57
Cool. So I got a few bits set up. Hopefully you guys saw in the in the teach HQ remote, I managed to put some documents that we're going to take a quick look through today. So there's a few above the promising bit. So we're gonna I thought we'd take a look at some of the more detailed binary in hexadecimal bits because there's a couple of once you get the board open and the chip to read in one way or other, then you're eventually going to have to take a grip of the thorny issue of binary reading and writing.

27:36
Yeah, UV cured fluid. Yeah. Yeah. So YouTube video during phones and other

27:42
consumer devices, you can bypass using fillers UV cured us, or is it? Yeah, it's a form of conformal coating will be richer. UV cured is the is the way Yeah, bonding non contact. You do any error in it really so whether you want to bond it down again whether you want to put contact glue that you know the contact paste the heat transfer paste in there

28:09
Yeah, we'll have a look. So good check.

28:13
Yeah, it's a good Good call. So I've got set up now on the other video. I've been having a little fiddle about this morning I've got one of the one of the applications has given me a bit of trouble this morning. So I've been just trying to do an update for it and it's not playing ball so I'm not quite sure whether that's mine and my virus protection is saving me from some level of doom project to do adventury here using the DVD I'm not sure how, how is that gonna work or not because I've got the application and that's using this the car Prague. So this is a genuine Karpov interface, which in this case is using a 16 pin connector and then buzzing off to the PC. This allows me Do this bench reading. So if you if you're into this type of thing, I think you should already one. So particularly of interest, some of the all sorts of brands are using that early one. But it's a, it's a, get the data from the front door there. This is all for GM I think. And then you need these pin outs and this lead here. The leads is interesting, as we said, it's got an can emulator in there. So it provides one element of the terminating resistor. It's also got supplementary power supply going in the top there so you can power the ECU up and there's also an ignition feed. So as well as 12 volts from the battery, you've got the option to switch ignition off and on which is sometimes necessary during the phase of reading and writing.

29:48
You have to better do that.

29:50
I've got the William programmer in here as well and the bits that were I couldn't I didn't have close to hand

29:57
on Thursday. This is the end Like eeproms Can you share on the big screen, please? Oh, yes, well, yeah, yeah, I can. Yeah.

30:07
I can stop that. Sure. Yeah, so I might have forgot that. That's in the little screen now. Yeah, so um, yeah, the clamshell device, then we've got to get that connection there. That is your, if you didn't want to solo this one here, you can see it's got some spring tension in it. And the leads and go down to the programmer, and then basically attaching to the programmer using that connector there. And essentially, you find your legs on E prime, this one sits over the form on the board.

30:41
I've got one on there, already pulled down here.

30:45
And basically, it's got a red tip. So where can one is there is a red marking on the edge of the device. So there's a little red mark here. And then that corresponds to that pin. So when You apply this, then you look at your chip, and then you try and I'm just gonna say about fine. Give me specs on their second

31:08
level and see, what you see is a little mark

31:13
on the problem that we can get that one if I get on to focus our second, you'll see there's a little.on the prom. This is again, you see like luggage Oh, if I try that way around

31:26
and the autofocus is brilliant when it works.

31:31
Let's go.

31:33
I think there's a lot of reflection.

31:38

Don't need a metallic reflection, the end devices using to get people to focus i think is a little bit wonky in technical terms. And you won't be able to see that now because it won't focus on one of those visits more about the problem. And so the clip essentially sits over and you line the red part with a dot and then B Basically placed the clip on like this and it's making a contact on the surface of the chip. As long as your number one lines up there, and then you'll read it will take over the control of that chip, as long as some other factors are happening, one of the things to describe First of all, so, this is called, you know, in in circuit reading, so you leave your EEPROM in the circuit and then you basically hook it up and then your programming device will do the control and it will start the chitchat and then send that off on the USB to the PC. With the EEPROM inside the circuit board, you can end up with a with an issue where the, your EEPROM reader device here and we'll fight with one of the components in the circuit board, which is a clock or an oscillator because these eeproms here, run they run out they run a speed bit like your PC runs, you know a frequency eeproms also run a frequency where they're reading and writing are set speed and this frequency is one of the things we talk about when we think about Canvas. And in vehicle networking because same thing again with the cam, the bits are specifically time so the logic levels that come off this chip the high and the low signify ones and zeros. And the time that the chip pins spends at a set amount of time indicates the number of ones or zeros that are sent across at that time. So there's an oscillator inside the circuit board which gives the yeah which gives the the command frequency and the oscillator the clock I suppose for the bits and trying to read it in circuit like this. You can have a fight the oscillator in the device and the oscillator in the in the circuit board have a rap. One of the ways to overcome that There's an option to lift, they call it lifting, lifting a leg. So what you have to do is you have to find your clock pin on your EEPROM. And then you have to basically unsold at that particular part of the leg, and you have to lift off the board. You can see you know, they're so small, but that by the time you do that lifting of the leg to stop it fighting gets the oscillation between the programme and the circuit board. It's just as old as the thing off. Yeah, so these sound like a great idea. And when you're learning the clamp clamp on reading clips, can can be can be an attractive option. But as we said, if they fall off as you're doing a programming, it could end up rendering the rendering the chip pretty useless. So we have to be quite careful that we're not getting into that. Yeah. So there were a lot of chips. Let's go back. I'm just gonna have a little screen share. So the thing I was going to show you, that was the other part, the other clamshell, so if you do get to take that EEPROM off there, this clamshell device, it's a smaller version of the one we looked at on on them. Yeah on Thursday, and that little clamshell device has got connectors then which sits inside my reader. And so I can put that in my reader position. And then I can park the bits and I can drop my chip in there with a pair of tweezers that will make the connections and read the read the chip outside of the circuit board. There are also some adapters there which are their flat circuit boards that have a connectors on them. And so what you have to do with those is to solve it from the board, and then you resold it into your reader. And then to be honest with you that that's a bit of a bind because you're going to solve and be sold or twice in each case to get off the board these older into the chip read at silver diesel From the chip reader resolder into the board, and I think the clam shells for what they cost a 10 or 1520 quid, whatever they are, just make it much, much easier you can lift that off and drop it in with your plot your tweezers and then let that go. And you can do your read process from that so much, much easier. So clamshell,

the GX, for the programmer, whichever flavour of programming you've got. We'll also have a number of clips

36:25
which which fit.

36:28
So can you write is I'm just going back to the chat here. Can you Is there a quick way of identifying the different types of chips on the boards to them in fiscal year? Two, they're their own physical characteristics. Yes, they do. Yeah, so they have numbers of markings on so we're going to get into one of the documents I stuck in there was a datasheet for one of the typical processes one of the typically proms there so I thought we'd have a do we do is have a little look through that because It's a really interesting point. Number one, how do you know what the physical attributes of the thing that you're working with are? But also? Yeah, how does that how does that work in the programming bit? And then how do we set our software device up to be able to look at that?

37:18
So we'll have a little looks, we'll have a look through that.

37:23
and

37:25
identify the types of chips on the board. Yeah. And I'll show you also, there's a bit of software that I use, if you're going to do a few of these, it's worth getting involved with which also, I think can be another question last week about how do you identify which of these chips is which so there's a bit of software out there, which is a good it's like a Data Reference for the various Yeah, certain ECU and types. Can you rewrite a chip or security or Vin locked or an encrypted part? Yeah, Greg, you can and there's one type of chip One type of a problem that can be a bit moody. And we're getting into the advanced stuff. Now if you're looking at a standard EEPROM. And there's one of those which BMW group a vehicle using the odometer, and that type of chip will only have what's known as an incremental, right. So as each, each time you put data in there, the number can only increase. And so really, that the idea is that they're trying to stop people from trimming back your mileage. But essentially, even if you wanted to do that, you get a new blank EEPROM. I think that 95 160 is the top of my head, the prototype, and you just get a blank one and zero and you wind it forward until you're below the writers original one. So yeah, there are all sorts of things that are put in place to try and stop it happening and those those guys are trying to stop that happening from the diagnostic port. So even if you're trying to get to the prom in the circuit board through the 16 Connect Which is possible, which is, after all, how we do a lot of programming. And if we can put that into a mode where it will only accept bigger numbers than it does make that more difficult, but if you get to the circuit board, often putting you in it now, you can type your number in and set to go where you are. And the other type of control unit you'll see, have some of these are where you where you're looking at a bigger processor. So some of these processes here, that's an integrated circuit

39:29
over that process.

39:31
That's often known as MCU. And an MCU is known as a microprocessor or microcontroller. Some of the microcontrollers then have something fitted on them call a mask, and that essentially is is a almost like a pass key to get into the chip to open it up for a proper read some of these chips if you don't have that passkey the virtue of trying to read them without the key essentially tortures all the information inside The chip. And so you need to be a bit mindful. You'll normally see on the chip in those small little letters that you can sort of see there. Like, there'll be a mask identifier. So there'll be a four digit number, and the processor itself will display its mask, and then the reader device that you've got, will have to support the reading of that mask on that chip. But most mostly, most of the chips if you've got the right sort of a decent, decent reader will support most masks and nothing's really off limits. There's there's ways around all of that stuff, Greg. So yeah. So if you've got a Vin locked parts, if you're trying to replace, you know, hot swapping, control units, body controllers or instrument trusters and stuff, yeah, you can do that. And there are all sorts of novel ways around that. Yeah, so Ryan has a question, Jimmy, it can only be written once. No, it's more about I think that if we're talking about the one of those chips, right, it's more about it can only be the data value can only increase. So when we when we get to data values and embed it, we'll see that the data value can can increase only. So that's specifically a mileage chip. We're talking about that. Yeah, Ian's asked a question about particular readers, particular ride devices. And really, it's going to sort of depend on what you want to fiddle with, I would recommend, as you get going, this, there's a new new version of this, the GX, GQ, four x, which gives you a good a good range of the Lower Level II problems that we're looking at. So some of these eight legged ones that you want to start with are well supported here. Also, memory chips are well supported here. Some of the flash memory with an adapter can be read and write using this one. And they're not they're not big bucks, and it's really, really it's a good way to get you into the zone there. So as a start point, you know, and recommend that This one here and I'll put a link up there sold by a company called MCU. Mal. And these guys also supply all the bits and pieces that go with it. The software is free as we've been upgrading they're nice people to deal with. So I'd say that's a good one to get going with your second option about readers and what have you. And there are various cloned options of various equipment out there. This is got some competence on this one, this is a car probe. Again, it's not it's not the best or by leading edge and more, but it's got some really cool and interesting features in there. There are some other ones called smoke. And they are a Polish company and they've got a reader that can do I suppose they break into two different levels. I suppose the readers are either either circuit reading so you're taking your you're taking your chips off, you're putting them into some sort of reader and then you're taking the data in there. The other one, then is like this one where it has the option to do OBD. So if you want to use a pin app here, so you want to get your pin and bench process the thing, that's another version. And the bench processing can happen either through the front end through the terminals on the control unit, which is great, or they happen in the circuit court. So we talked a little bit last time about about this one here. These little connectors on the back here, that's another method that some of your readers will

support. So that's called BDM. Where you get got some here, you get, like a frame that's the board sits in a frame, and some pins come out of an adapter and they're spring loaded and they make they make contact with these edge connectors here. It's also known as j tag. BDM stands for background debug mode. And this is a standard This is how the units are generally programmed for the factory with your bench. Yeah, your bench flashing. So your reader will also have the ability to support BDM potentially. And it's not a simple question, unfortunately, because it sort of depends what you're going to be doing with it. So, yeah, that there are lots of lots of options that are not horrendously expensive. But yeah, PDM There's a famous bvm 100. There's another one of these units called x prog.

PART 2
44:32
But you can very quickly it can be like scan tools that you end up with, with this, this unit does most of the things you want to do, but it doesn't do these ones and you buy another unit and that has nearly all of the rest of them, but there's still some you can do. So it's a bit of a voyage of discovery that you're going to have to think about picking on a car and having a batch and I would say if you're going to pick it on the old stuff, etc. 16 need to see 15 if you get something that can do the bent the background debug mode on these little pens, and or one of these GTX GPU four axes, that's a really good start. This will allow you to do some bs eyes and that type of thing as well. Where you get into more processor types. So this is standard EEPROM, where you get into the processes where you've got a processor inside and an EEPROM. So they're the bigger chips that normally normally signified by having instead of two rows of pins, these things now much bigger, and they're called the quad chip. So there's, there's more connections because now this is a processor. These are your inputs and outputs as well. So these are switching sending data yet pulling things up and down. You can have Yeah, it's a single, it's almost like it's a processor and an EEPROM and some other stuff in there as well. So these processor or MCU reading will take you probably passed what this one can do, unless you can bench it with with a device You don't need to take out then you great. If you need to take that out, then you're going to probably need a different type of processor here because you've got plates that these have to go on. Some of these will also do that. So by virtue of a little fly, this car pro can do bench reading or in circuit major processes like this one. So on the edge connector here, we put another lead on that so we have another fly lead that goes on here and it comes with terminals. And the way that you get involved with some of these bigger processes then are you identify the pins, so see if I'm getting this into focus a little bit, you'll see I've got two little dots here that are showing in a light one new one here, there's also another little.on that corner. I'm just going to try and reflect that round. So we'll see if we can get to show you where pin one is. So

46:53
it's very difficult to see because the dollar is quite small at the end

47:42
Six Six and 10

47:54
James live again okay

48:28
It sounds coming out of a scratchy and horrible okay I'll just yeah just swap mics them in it so I think that's because the camera the camera got asleep a minute and that was a winner yeah we'll leave we'll leave it like that okay so I'll go back to this them

48:46
so the processor types where your where your subway or insert readers will give you a problem is when you come to come to processes rather than just bury problems So where you got processor, your little circuit adapter, your EEPROM reader, your code device has got some fly leads, which essentially are soldered to the pins. You have to identify which ones pin one and there's a little dot here, but pin one, count around the pins or the process and you end up putting eight or 10 fly leads from here into the front end of your processor and then and then doing a read. But to understand why you need to do that it's probably relevant for us to have a little look at the next step. So I think I'm going to try and bear with me a second while I get the. Yeah, I'm going to share the screen here. Yeah.

49:43
Yeah, I'm going to share the screen. What we're going to do is just take a little look.

49:50
Hopefully you guys have seen that. Let's go back here. Let's get into the file manager and let's go into the data sheet. Right, so I'm going to share the screen and we'll have a little look at data sheets, because this is where it starts to become interesting about what we need to do and why we're doing it. Because that's half the battle, I suppose understanding. So I'm going to share the screen here. And what we should be able to see is a data sheet of sorts. I'm not sure if that's exactly the same one. Yeah, that's a good point, David Davis making now that when you're into the lower level stuff, and older stuff, the GX four will work when you start to get into MC use and processes your you can get into. So you can be into this for 100 or less. And then when you start to get into the bigger stuff, you jump up into the thousands. When you've got when you're looking for coverage on some of the more expensive processes. Yeah, and I would suggest in your journey, if you will get to grips with this with the single Yeah, the double edged eight legged economies and do your reading and your writing your removal and refitting. That's pretty cool. But if you get into the MC use and you will have gone along the path to a, to a place where you know that that's relevant for you. Yeah, that's the idea. Okay, let's have a little look. So I've got a datasheet out there for a type of National Semiconductor, a 93 cS 06. And Colin was asking how to identify the different chips etched into the top of the chip, then you have that number. And so you can identify the number and then find the datasheet. for it. The date sheets are generally freely available. Because Richard made the point earlier on about consumer devices. A lot of these chips, processes and microprocessors are used in all sorts of different things. So you might find this in in your TV and your radio in your clock. your doorbell in your microwave, there are loads of different applications and functional uses there. For this, I'm just going to expand that one out there a little bit we've got, hopefully you can all see that on the screen. This is a picture now my eat crumb as it lies in the package, and it's called a dual inline package to inline D IP to surface mount device. We've got here the identifier of the chip. So

which way round the chip goes, this will either have a little little.or the segment missing from the column so we know which way is up because we talked about in the last video webinar, we talked around. We talked around getting these in the wrong way round because each one of the legs on my econ we start off with these equity columns and I've got a number functionally normally start off by identifying them One and then go down across and back up the other side. And so my pin one has got OFFSET function which is which is alluded to here, CS and if we go across here to the pin names, CSS chip select. So pin one is my chip select and what that means really is that if that has a voltage applied to it, or the voltage on that is dragged to a state, either up or down, the chip gets ready for it identifies that it's it's it's up next for some either reading or some writing. So my chip select if I got my chipping upside down, my chip select pin would be mixed up with the ground so the ground would be where the chip so that was on the chip so that would be where the ground was. And in on that basis, if the internal control unit was looking to read away from you put it in upside down the activation voltage it goes to chip so that would be just applied to a grand pin and the chip wouldn't wake up and you wouldn't get any communication It wouldn't read it wouldn't, right. And so that's, yeah, that's one of those that we have to be careful of. And so that's why identifying it we said taking a photograph is one way you see people marking it with with pen, putting a white.on it, I would recommend taking photographs because what can happen is if you put a little white dot off something on their paint or the marker when you use the chip, when you use the flux off the alcohol to get rid of all your flux after you refitted, it wipes off the mark. So you can be quite, it's quite easy if you're using the dot method to lose that. So take photographs.

54:41
Yeah, let's see.

54:43
Some of the chips are difficult to locate and know what they are, which brand they are, and also their function can be an issue identifying chips. Your other option is if you've got Wi Fi users to your hardware and software. Look, you know are the same. But as often if you've got one that's damaged, you can do a donor one from the same control unit. Most of these still haven't have a number that you can identify where they are. And you might also find super sessions. So where you've got one type it may be Yeah, Chip numbers, lots of help out there, they are richer, you may find them that there's a supersession that says you can replace that chip with this chip no problem it can be used in it. So the chip some that will run through the pin functions because quite interesting. So chip, select number one is the voltage it takes us from one state to the other. I'll go through a little pictogram in this serial clock SK is a serial data clock. And so the serial data clock is the rhythm This is the speed at which the clock The clock runs inside the board and then the chip knows the speed of the data transfer. So this is where we have an issue if you try and programme this in the circuit board the serial clock is right From an oscillator, the oscillator essentially gives it a fluctuating voltage at a set frequency. And that is that gives you that gives the chip and the processor you know, a rhythm to work against the sharing the bits of data. The next two pins and and that's what you find. So your reader if you read is connected here in circuit, it starts to oscillate the clock and the clock starts to counter oscillate and the two things ever fight an upward shift and always doing Yeah, boss, do you have a lot of automatic low end

components? Yeah, they do. And that's where you might be into a donor board. If you can't buy new ones.

56:37
The Chinese folk

56:40
look here and go, I go code card.It.

56:47
Hopefully you can see that screen still. So I'm just, I'm just going into here. So if I hopefully will see this so you can go to Bosch IC and Just Can somebody put in a comment you can see the screen because I've now gone I'm using a internet. Yeah, I wanna Thanks, man. Yeah so Khokhar these guys then have got electronic devices here and they're probably one of the ones I found apart from some of the weird ones in China that allow you to reference your Bosch IC part numbers so i C stands for integrated circuit. And so you've got an IC there is just describing as a Bosch 4835 Auto computer chip car electronic driver ic 19 quid Swift.

57:36
And you've got you can see there hopefully

57:40
on side your portion, I see you've got your part number and your identification. It's in some doubt whether these are genuine or whether they just are fully Chinese Ium clones and copies of the chips and these companies this these guys have been I've been dealing with these guys for a long time, and I don't think they still exist if they were complete rubbish so all of your chips your boss specific ones are listed here abortion IC automotive chip these would probably find these in the board that we've got over here we probably find why these driver chips either here if you can see the small window still in here this is this is exactly what that board back check looks like there are three or 592 so there are there are ways around that there are methods to find this stuff. I think I bought all of the chips from a poster board chips. Yeah, yeah, they may be here. They might be chips recovered off the board. It's a really good shot. Yeah.

58:45
They might be recycled.

58:49
And you know, that's that's an option. You can do that yourself. If you build up your scrap parts. It's easy to identify chip for chip on a circuit board. They do all sorts of stuff. There. As a power supply chip for EDC 17, some of these identified in some greater level karti injector drivers. But yeah, however, was over to the code card guys. And they're based in Lithuania. And these guys are, you know, Eastern European trade seemed to be quite resourceful in finding some of this stuff and making them making making this stuff available. Make a man so yeah, there's a whole heap of stuff there. If you're specifically looking at Bosch, if we

listen to their electronics section, they also have got a or two things we're going to hopefully get time to talk about. Yeah, they've got other stuff like ad display. So for instance, if you've got trouble for instrument clusters, and that type of thing, you've got driver boards and also individually individual TFT LCD displays here as well. So it's possible if you have a touchscreen malfunction. You can buy those screens here as well, or the info panels in the middle of insulin clusters. So they've got all sorts of stuff here. It's worth it's worth having a look at having a scout round and seeing if you've got a need for any of their services, but yet please stand up. You're sort of a group of people that this stuff comes through pretty quick. I'm pretty sure it's next day or the day after, and they have got a technical support line as well. So you phone through get get that stuff. I think these are all go into separate stuff. I didn't mean that's all that's all separate about our econ for a second. Yeah, so our integrated chips. This is a great way of understanding the basics of how this stuff works. So you've got the third pin we've got that is data input. So di on pin three will be data input, and then pin four will be data wrapped. So you can almost you could think of this as reading and writing. So these are my inputs and output pins. So essentially I've got power over here Vcc power supply, I've got a ground, which is two things I need, then I get my chip select that goes to a state of active or inactive, then my serial clock is sending through a pulse frequency. And then the data on is coming in on pin three and on pin four. So that stuff, we sort of, you know, we've got that, that's pretty basic actually. P is programme enable. So if the chip needs to be programmed, again, the status of the voltage on that pin will change from low to high or high to low whichever way round is. So power ground programme enable chip select serial clock relay, and we're pretty cool. And then there's another one there, protect register enable yes or no. So if the parts of that that you don't want to write and that the pin on that chip will be changed. In status one way or the other. So that's the function of the eight legs and eat problem, it starts to become a bit more obvious then of what that device is doing. And in this case, we can we can consider the problem a bit like, um, you know, like a memory chip like a, like a flash drive, or something like that, where there's, there's some data in there that some other part of the processor or control control unit will use to read and to write off that stuff. Yeah.

PART 3
1:02:29
So one of those screenshots, so I'm just going to fit with overnight to the presentation bit here.

1:02:38
The presentation but then if we go

1:02:43
to the post presentation, but so I'm going to just take this a little look down here. And hopefully you can see those two screens now.

1:02:52
I didn't expect this but

1:02:56

we start to get into the technicalities of the prompts. Where we have to start to understand some of the technicalities about bits, bytes nibbles and words becomes important if we're if we're starting to look at manipulating that data. And our trajectory here is we want to repeat from to get the data, a typical use case would be where you've got a psi, and it's a, it's a doughnut unit, maybe. And it's got a PIN code in it, you don't know what that pin code is. But you need that pin code to be able to put that into your scan tool, diagnostic tool, whatever it is, to be able to then use that serial tool to unlock the BSR to recode it, what have you. That's a typical use case, then where we've got the last pin code, or we're looking at dead donor swap. So from a previous it's been attached to another car somewhere and you've got a pair and we'll match them. So you can do a cloning job as we talked about where you just take all the data from one chip and blast that into the next one. And there you're just you're you're setting Claiming. So the problem data is taken from your, your good unit that's maybe got failed internal relay or something. And you're taking equal data out of that. And you're taking it on your domain unit, which has got a good relay in it, and you're transferring all of the vehicle specific stuff. So this probably goes back a little bit to Greg's question. You know, can we change data in protected units? Yeah, that's exactly what we're doing at this level with that with that EEPROM reading

1:04:31
and quick stability now.

1:04:33
So when we when we do that, there are two options include cloning is really easy because in your in your EEPROM reader, you've got function to read the data, and then to write the data. When you read the data, it pulls out the chip and stores in your PC. So in that case, you would have the chip from your donor and you would have your, your original chip, and you essentially going to read the original chip store In a PC, you're going to get your donor chip potentially and write that back in. So that's one way you might find actually doing a read and write it. If you just lift the EEPROM from the from the original board and replace it in the donor board. You won't need to get involved with any of that data stuff, you're just going to swap the chip. That's that's the basic basic of the mall. That's a favourite trick with you know, some of the random body controllers, the uch is it's just swap a chip with a piece of cake. You don't get involved in the binary stuff as long as you get it on, right, you got good soldered connectors, you can you know, you can swap a body controller, where it starts where you started to understand some of the arrays and the tables and the binary. The hexadecimal is where it starts to get into PIN code extraction. So where you need to put where the pin is stored in several locations, but you need to know what it is. That's where you get involved with your pin codes. And the Vauxhall ECU that we've got here. So has that These units particularly and we start to get into the brand specifics of a vehicle. With these control units, they're paired to the vehicle. So back again a scrape saying that is now matched by Vin, it's locked to that vehicle. If the vehicle gets scrapped, and then the part becomes available secondhand, it's still in its mind paired to the original vehicle. So you can't just take this and plug it into the car because it's got the personality of the car in it before. To be able to train change the personality using your factory scan tool. For instance, we need to know the PIN code of the donor unit. And once we get that we can essentially divorce it from the car no longer belongs with and then pare it back up to the no new new host. But the PIN

code cannot be extracted by the dealer tool. It just wants to know what it is and we have to get them involved with this reading of the data from the prom. In the table that comes from the prom we'll find the location and in that location is stored the PIN code. We basically extract that write it down and then we Back in the car go in with our standard process for replacing an ECU. And when we enter that level, you need to have a have a sympathy or empathy with some of the bits and bytes of the data programming. And we also start to get into a little bit of hexadecimal. So for ones and zeros to some basic to two bases of eighths and sixteenths and 30, twos, that sort of stuff. So, yeah.

1:07:31
Right, so the problem with on our screen now we've got some bits I'm going to highlight. Really, this is the this is the basic fundamental knowledge if you think of the chromosomes as an empty spreadsheet or table and in each one of the locations in the table, it can have a value of nothing or a value of one and that's my, my basic level of eeproms. It's a store and transistorised transistorised store with a value resident in there over one or zero The array where that is in the table and how many numbers are before and after it go to make up the detail that the computer will need to know. So for instance, if I had a PIN code, a four digit PIN code that was stored in there, I would use several of those locations with an array of ones or zeros to give me the beginning part of the code. So we'll cover that in a short while, but we need to know fundamentally the base level is that's a it's like a table that's got the ability to store all nothing's all ones or across that table, a variation of ones or zeros. If you get your head around Canvas, you know how the voltage in a can signal is changing the voltage level high or low equals a one or zero. That's exactly what we've got here. But instead of dynamically, we're looking at communications with the chip, the chip will maintain that value inside each one of those tables, irrespective of having a voltage applied. And this is one of those things that makes it you know, it's the same way my memory stick works. How on earth does the memory stick Remember, the data that's in there were no power supplied. And years ago, if we think back to videos and tapes and that type of thing, they were magnetically stored. So there was magnetism applied to that tape which changed essentially. And you know, the value in there, these things, they're transistorised. So the table is controlled, it can be pulled up or down by transistor. And each one of the values in the boxes through a transistor can have a change of state between a one and a zero. Once that change of states been done and the voltage is not applied, it's very difficult to change the state of that individual box from a one to a zero, but there are ways you can do it. We talked on Thursday about with our circuit board we said about static measures to control your static output. So use a person can contain a charge and if I can touch one of those pins in my hand, it could essentially apply voltage on the pins. in the right order, and actually change the state within that chip and corrupt the data. So by mistake, the static in me, I could touch that chip and it could change the values in that. So that's one of the factors when you're doing electronics, you have to be quite mindful of your static charge. But the data inside a memory stick and other you know, solid state devices is such that generally I forget the specs now, but something like 100 years and they've got they've got a specification on them that it can take so many different rights state so you can change the data in that thing. Unlike in the olden days with tapes and cassettes when they would get worn out from use because it was physical contact. These things have got millions of write cycles before they ever have a problem. So you can you can change the contents of this thing, you know,

hundreds of thousands of times and it won't have an issue with it. And also it will, it will stand a set amount of temperature and voltage being applied to it before it corrupts. And also, the state will be maintained for a set period of time. And I'm pretty sure the base level of these things, it will store the data in a uncorruptible state, if it lived in a drawer for 100 years that the gate value of the voltage inside that chip would sit at, whatever whatever level it was. So they just pretty sturdy and reliable, which is why we hold world's going across to using them, but they use the same basic principles of data storage as my eeproms. So with this thing plugged into the computer, obviously my memory chip my USB drive, and it's controlled through serial data, but the array inside that thing is a flash chip. And the flash chip is controlled in exactly the same way as my negative, just on a much bigger scale. And we can do it much quicker. We can change pages of data, whereas in my Econ, we're changing individual and individual segments.

1:11:52
We've got a couple of technical terms to think about. The bit is the smallest part so you can't get any lower level than that. So When we think about, you know, this is a 32, or 16 gig drive, there's the individual bits of ones and zeros that go to make up that are huge. And that's quite small drive. So at the base level, the information is stored in ones and zeros inside this thing, and there are millions of them. But we clustered them together to be able to start to process the data. So the bits don't just sit there randomly. They're organised in subsets and smaller groups. So you've got 16 bits together is called a word. eight bits in a row. So eight individual ones or zeros is called a bite. And so this is where the term bytes kilobytes, megabytes petabytes, gigabytes, that comes from a cluster or array of numbers of ones and zeros together in a in another cluster. So that generally we see eight bits together or a byte. And then that byte of information we know they're eight ones and zeros Contributing to make that number that that value. And then we've got the only funny thing in our computer terms is half a byte, that's four bits is called a nibble. And that's the single hilarious thing that we've got that.

1:13:15
Yeah.

1:13:17
The single byte can obviously represent two bits, the bit can either be up one or down zero. Yeah, what else we got those common grouping bits as the bytes are eight bits. And each can be one zero to 256 possible combinations and ones and zeros arranged on a bit grouping. So there are 256 very variable states of ones and zeros with an eight bit grouping. So just by using the ones and zeros in our array of a cluster, you can have a you can have a shedload of different different combinations. And we think about going up a level down to the prom. In the prom, then we get addresses. So on the screen here we can see the addresses from the people on this side. You've got an address line. And in your address line, you've got these array of eight bits individually. So we can see the eight bits there. 012 zeros, a one, and then three zeros. And that array of those bits in that byte gives me the equivalency. When I talk about the next thing, hexadecimal gives me a value of 48. And so the value of 48 is the second part of the process. The lowest level is binary. And then we go into hexadecimal where we start talking values of eights and the hexadecimal for us if we're

using a computer, for instance, the hexadecimal is then changed into something called ASCII or symbolic instruction code. And ASCII, I posted the sheet up in the in the group then which was an I think it was an ASCII

1:14:53
ASCII chart.

1:14:56
So hopefully I've just changed over there. Now to an ASCII chart. So that's a byte encoding chart, which we're looking at. And so if we go back to my hopefully you can, let me just change the screen now to share that. Just change the screen share that. So let's go screen share, you share, you share, it's going to be the ASCII chart. So this is loaded up into the, in the group, I added a new lesson yesterday, which was webinar number nine. And although the video is not in there yet, because we haven't made it, I've put some learning resources. So if you go into that lesson and have a look. In number nine, the link to the today's session was in there, but also there's a resource pack in there. So in that resource pack, I've given you several things, including the EEPROM data sheet, which we've just looked at, and also this ASCII encoding chart. So yeah, what we can have a look at then is we go back to the presentation, we were looking at sugars to erase it shows us Some arrays of data in a byte. So let me just go back to that, because I'll just show you the link there. And we'll do the link back to the ASCII look up chart. So let's imagine I read my EEPROM. The case scenario is that I've taken this EEPROM. And I've read the data because inside the control unit is a four digit PIN code, which I need to either code the key, either to code that unit back into the car, and I need to unlock that pin code to be able to do that. So that will lead me to getting the chip off the board, sticking my reader doing a dump of the contents of that equal and then going through the addresses in that EEPROM array and finding out a set particular point in that EEPROM it gives me the number or the value I need. And this is the part this is going to stick with me. It will start to make sense in a bit. So if I looked at address zero here, in my read my EEPROM I would find eight individual bits of data which in that array are called a byte and the value depending on the ones and zeros are, if they were all ones they give me One number that all zeros that can be another if they're an array. This is where we get the true combinations for one array of eight bits. Is everyone happy with that? So they'll depending on what what bit is a one or zero can change the overall value of that bit of that byte of data. And we'll just do a quick look up. So I've come back to this one addresses zero on the screen, you can see that is zero or one, two zeros, a one and then three zeros. So if I go back to Sherry, now to the ASCII chart, we're going to look that number up. So ASCII charts back up. So if I look at that array of bits there, so I've got a zero, I'm just going to zoom in on that case, it's a bit small. I've got zero, a one, two zeros and a one and then three zeros. That same numbering gives me the hex value of 48. Right and that's is a shorthand way of looking at those eight bits of information in one byte 48 got it happy with that, if we come across to the, we'll keep sliding across them. This is called an ASCII chart. And so those that those bits of data, that one byte of data with that value, we're just going to try and highlight that. So it's, you know, one thing, that array of those bits Then give me the equal of four h. So my turn my binary, work out the hexadecimal value, because that's what that array of bits is. And then I spin that into ASCII, and that gives me h for that address in that EEPROM at that point. Now we can start to see that my four digit PIN code, for instance,

might be 1234. It might be four letters, it might be a combination of numbers and letters, but with the individual bytes of data, the F The chart basically gets me through all of these various combinations and equaling the current, either value or state. Now, some of these are reserved for sort of computer functions. And others of these aren't and we can actually have a little look through that.

1:19:17
So go back in their computer.

1:19:23
So I think

1:19:25
so for instance, I've got my, my numbers over here as well. So I've got ASCII letters 0123456789. And so if I wanted to pin code to be 1234, I'd need I need four bytes of data. And in that, if I looked at those bytes of data, they would give me an ASCII 4950 5152. But if I looked at the binary, it would make be made up of these four sets of binary that would give me my PIN code 1234. So hopefully with with that so far, so I've gone down To the binary level inside the chip, I've done my dump file into my reader. And then I'm going to look at some addresses inside that array, and then work out what the PIN code is. And that allows me to extract that data 1234 as long as I know the addresses, and I can do the translation between binary and hexadecimal.

PART 4
1:20:17
I'm going to open up the chat just a minute to make sure

1:20:22
we're all still with it so far,

1:20:25
because that's binary hexadecimal is a bit interesting. Doesn't look at the chat. Yes, the chat quiet or not again. Let's have a look. Has my mic died? Let me have a look.

1:20:41
Some it says it's okay, but maybe it's not Sam's gone.

1:20:52
Okay, J Exactly. Fine.

1:20:55
Yeah, sorry, Batman. Yeah, no, okay. I don't understand what you say. But I can hear you.

1:21:02
You can see the mouse moving. Yes.

1:21:05
Oh, good jets loud and clear.

1:21:08
Oh, good stuff. No. Okay. Yeah. So what I suppose the nub of it is we're going to, we're going to look through the dump file I get from the Chrome. And we're going to we're going to have just loaded ones zeros in.

1:21:21
Where do we get the address that's it.

1:21:23
This is the address number will come from that magic reference, I'm going to show you in a minute. And you need to know the address numbers from the

1:21:32
let me let me within two internet sharing here and I'm going to share the screen.

1:21:37
going to call this one up.

1:21:44
So I'm just going to do another share now. I'm going to share the internet.

1:21:51
And then these guys over here,

1:21:53
when we start to think about either addresses and or chip values and locations, we can all see that These guys here to a piece of software. Well, they do a couple of things really they do. They do one of these here, which is an emulator,

1:22:07
which we'll talk

1:22:08
about in some detail later on. And this can cover a lot of different functions.

1:22:13
But they also do a car lab mo

1:22:17
bypass software.

1:22:21

So cannot be bypassed software. I run the software here, I think it costs about 400 quid for a licence. And they're quite

1:22:34
strict on installations. And you can only run it on one PC, when you're doing a download of the file. You can only download one file every 10 minutes. You can't have it open with some other

1:22:47
stuff open. You can't do screen grabs and

1:22:51
you can't run on more than one PC. So it's very difficult to do anything other than buy a copy and have a look at it. And if you're interested in Doing some of this stuff before you buy it if you if you want to, you want to get involved with some of the stuff there, I'm happy to look up things for you as long as you give me a bit notice Don't be like I'm on a car now and what I need is the pin function. But if you've got some scrap piece to use, then you want to know where the pins on the locations are.

1:23:20
And I'll run a demo in a minute because I've got this running on the PC behind me. And from the from the part from the,

1:23:27
from the ECU number, they do a lookup table and it generally shows all sorts of interesting things to look at. And it's quite a chunk of money to get going with and if you're not going to be doing a few of these, you probably are not going to need to shout out for this. You know this 400 euros licence. If you are going to do a few it's going to pay for itself in no time. Even if you do a few you know cranky ones and you know your your plumbing work, you have to find a charging model that works for you. And generally you know, looking at what the Cars either scrapped or not scrapped, you definitely you know, you're definitely not in the 10s of pounds you're in the hundreds of pounds for doing some of this stuff. Yeah, but we'll have a look at this. So current I've mo these guys here I've got two things that are important. One is the ECU type. So in the blurb here, they've got 8500 different support ECU types and in their database 650,000 individual files, and it's pretty robust and reliable most of the things are in there, you can get to

1:24:36
no junk topics I'll take I'll take

1:24:40
these to

1:24:40

these guys to task on some of this stuff. And what I would say is in here, the translations are a bit rubbish so they're I think Polish company. And what you tend to find is a mix of English and polish that tend to make it not easy

1:24:53
but as a source of where to go what to look at which

1:24:57
chip is which address value what you need to change This is probably the best I

1:25:02
found. And I'm open.

1:25:04
I'm definitely open for if anyone's done anything as good. We'll have a little look at that. No, Greg, no, it's up to you to do the work now. So Greg asked, if you can the dump file, can they work at pin? Nope. But it's quite straightforward for you to do that using using rudimentary

1:25:21
tools. So we'll have a little look at that. What these guys do, Greg is

1:25:26
if you get your dump file from your PC, and they'll tell you the address you need to look at on your individual chip. And then if you need to apply a little calculator to it, you know, you can do that. And then you can read off the screen essentially and write on a piece of paper write the value in address number 16 was a net equivalent equals on the ASCII code number one, you can basically go through it and work at and there are some chip calculators, so the car prog product, these guys, if you put a dump into it, you can press the D code button and it will spit out the PIN code for you. But there's such a variation between what is user supported, what what chips are supported, what types of processor are supported, what bin files are supported, you have to probably approach this with, I'm gonna have to just, I'm gonna have to decipher I'm gonna have to read the problem,

1:26:17
get the dump up and

1:26:18
go through it. And if you find Decaux piece of software that makes easy, happy days, but most of this apart from some of the common ones are dumped file and then spit out a number other times you're gonna have to get in there and do it. It's not difficult. It's just one of those. Yeah, one of those, one of those odd skills, but yet useful to do. So they've been far. So what we can do, then I'm going to switch across to this PC, I've got this other software installed on the other PC, so we're gonna have to take a little look, it should be hopefully, obvious from the screen. I'm going to just move over here a minute, call up the software. So I've been in the store and we've got an update version going on.

1:27:01
Somewhere here, we should find a bypass. So I'll just run this file, we should get to see it on the screen. If I get my big head white, and will not do well,

1:27:17
it's going to log in here.

1:27:30
I'll show you that this is the way to solve it, you can store this on multiple PCs. So I'll get that somewhere in the middle of the screen, you can see roughly what's going on.

1:27:41
And then also over here, on the computer, so you can see both see both ways.

1:27:48
So let's just change that to just give them Yeah, a little bit of a learning curve first, Greg, but again, as long as you're not in a major rush

1:27:58
Yeah, you should be right So you're not in a big rush. So stop the share there a minute. And then we'll get on the big screen. Hopefully, we're having a look and

1:28:08
see what's more.

1:28:13
Yeah, so the car groups are listed then over here.

1:28:19
You can search a phrase in that you could put a part number

1:28:23
and find any scene as

1:28:29
to what we can do like, I know the first five digits of a lot of the gospel and the third we imagine we've got

1:28:35
Bosch ECU 0251.

1:28:42
It will start to based on the Bosch part number the top here, you can see that it will start to give you a list of all these to use. It's fine to have that

1:28:51
search string in the front end of it.

1:28:57
And you can basically put the whole issue number two getting to a point where

1:29:01
we've got that you've got that ECU type in there

1:29:07
or you can search by

1:29:10
make a model so you can come down here and search by perception Volkswagen alpha fee it lands here. You can scroll down and look for our Ford now don't get too excited because again the content detail is a bit variable.

1:29:30
Yeah, so you may not have a lot of cars in your particular brand and if they are in there, they might be a little bit older but they've got a mix of stuff. Yeah, mix of stuff.

1:29:42
So I'm gonna pull up and purchase it from because we've had conversations about perception vs. eyes

1:29:50
and a camera so we can focus on the screen. It's not really in focus.

1:29:56
It's not focused on screen. This is the seminal Let's see. Oh, yeah, I see what you mean.

1:30:03
Again, we might get into that situation of

1:30:15
Yeah, we may be, we may be.

1:30:22
The other. The other option I'll do is we'll spin that around and see if I can get the idea of the PC, maybe blare a bit. And what I'll do is I'll put the I'll put the other camera onto the PC. I think that's probably another way around it.

1:30:38
Yeah, let's see. Just see how that looks. I

1:30:42

saw that one over there.

1:30:45
And this is partly that, you know, one of the issues that we've got with their, with their security is that it is just so tied.

1:30:56
See, this one. We may we may not may not Get that.

1:31:11
Just want to say that

1:31:20
so a little bit of

1:31:23
a second

1:31:36
test is no focus.

1:31:45
Jas, try tilting the monitor. Top backwards a little bit. Yep, you got it? No,

1:31:55
no, I'm not sure whether we're going to be getting there.

1:32:11
So essentially

1:32:15
what you've got then, if you can see roughly these are chip sides, these are chips along the side there. So if I pick this one

1:32:25
in the list of files, you'll get

1:32:27
roughly the gist even if you can't see it completely, and it's gonna list down the details of the chip type.

1:32:34
And then yes,

1:32:42

no. Okay, this is all gone. I just touched the screen in the back of my video, just load that again.

1:32:50
The only other option is to see how that looks on the biggest screen is to do that

1:33:01
That's baloney.

1:33:06
But let's just fire that up again. Okay.

1:33:11
I think that's the way to do it is to do that instead.

1:33:18
Yeah, that should be that should see is that

1:33:29
right there we go. So I want to talk we want to see is that

1:33:33
better? Right? So we'll just go back down here and have a little look.

1:33:40
I just want to pick that section one because I've done a quick look through this

1:33:43
morning and found some array of interesting stuff.

1:33:52
Okay, so we can see that that looks somewhere. I can see that on the on the video link here. So hopefully that's readable

1:34:00
So I'm going to take the, I'm going to pick that. So compared to I'm taking, I can either take the vehicle up here, so I can go

1:34:15
Persian

1:34:17
307, or I can pick that BSI type. Or I can pick the vehicle type, you can use either or option. And if I have a quick look up here, the first file it gives me over here is a 95 160, which is the prime time original read. And so on the screen now it's basically giving me this is where we start to see the tables. So these are the address numbers. And then these are the individual

bytes of data. So I've got 1-234-567-8910 1112 1314 1516 individual bytes of data, and this is the hexadecimal value that's stored in this. So in that address, then obviously I've got that 0000 and that location is used In a grid format, so yeah, we've got

1:35:04
time across the bottom and the scale over there. Looking at

1:35:10
what does it mean if they're all FF, it means they're all set to a binary value of one. They're all full.

1:35:15
So Ryan, if you've got worth x, as you can see here,

1:35:20
we've got 00 ff and basically they're all zeros or ones. And as you start to, you know, as you start to go through this, sometimes if you're doing a read or write, you have to flip them from all zeros to all ones or from all ones,

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zeros. But yeah, that's that's basically the table that we've gotten. And, and so that's the value. So if I wanted

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to change if I want to know what the value of the immobiliser code was, this should be a D code. Clue written here somewhere. So that's the original one.

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And then we're going to try and find his spine.

1:36:00
There's a senior's with a pin.

1:36:08
Right. So what these guys have done then is in this table, they're telling me that in that row 60, these last two, B, eight and a D. And then these first two over here, a C and a seven, are the values for the immobiliser code stored in an EEPROM. Then they're the numbers. And that's where we need to read in our binary file. So on a dump file that we get into our reader, basically, we just look at this and find that when those are

1:36:48
Yeah, and that's, that's essentially

1:36:50
one of the things that we have to do. That's what we have to look at.

1:36:56
So that sort of goes to explain when you get your read from and you're done. When you do your binary file read, you need a piece of software like that Karla demo to give you an idea where the time you come to look, or your, your reader does this automatically, so it will do that for you.

1:37:18
Okay, anybody got any questions?

1:37:27
Right, the other the other thing that springs to mind right with your all Fs is

1:37:32
you may have done an incorrect read. So when you've got all that, that's just coming back to the chapters, I think we've got all that that's

1:37:40
not a footwear module on a BMW James. I've just done well in playing with one. Yeah. And I've managed to do in the in the last file. Yeah. And now it's all works. Hmm.

1:37:54
Okay. So in the flashes all generally that's a read issue potentially. If you If you've I don't know what stage you're at there, but if you've not got a successful read it will it will show you Fs in all in all of those charts that we've seen on that screen. They will all be Fs Yeah, so that's definitely read thing. And yeah, Richards just popped popped thing there, you know, can't zoom it onto the laptop, that one, unfortunately, so no, this is the only way we've got to do that. And hopefully you can see it, you can get a rough idea from that

1:38:27
one.

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Mhh auto is another one. There are a few forum groups around them around the place actually a quite useful for bending bin files and exchanges and what have you. Yeah, apart from this software, so and generally what you'll find is people looking for either virgin files or

1:38:47
originals where

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they're the one they've got been corrupted, and they need to reprogram it, or they want one of the new

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one that's never been attached to the covenant allows you to do your coding or programming it

1:39:01
Just while we're over there,

1:39:04
this

1:39:06
there is this bit over here, which which is another level, I'm just quite conscious, we're coming towards the end of our time talking about

1:39:13
e proms and hex and hexadecimal. This is this is suffering a level of encryption over here. So the, it's not quite as plain as just taking those numbers and putting them in the ASCII sheet. There's another level of decode that goes on.

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Maybe we'll take a look at that in a future session.

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The other thing I wanted to talk about, and it was the other the other thing that those kinds of doing quite well known.

1:39:44
And they also have an array of

1:39:49
emulators. So if we go back to their major part now, I would say that software 400 quid

1:39:56
is useful if you're doing a few it's not perfect. By the way and it doesn't cover everything but it is a it's a good start you're probably gonna have to just make sure that if you're going to buy it for a job that it does it yeah but um you know good shot is asking in the chat about reading right you always need to do a backup before you do anything as a read it back up and then fiddled with the backup fiddle with your your farm and always have

1:40:21
a known good backup

1:40:24
product. So they've also got our immobiliser bypasses. So

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we were looking at this little product here. This one is a little box of tricks that enables you to fit this into a car.

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So that with these little pins coming out the back of it. I spin them around the other way now will spin around this way, but

1:40:51
I'll spin this around as we see what's going on.

1:40:55
Back in the swing. So that emulator Remote emulators got these wires on the back end of it. And they got a function. So they are all given a function so got can on their code grounds CLI, and the little Mo. immobiliser emulator contains a bit of a processor in between please, James. Ah, sorry, mate. Yeah, let's just change the screen. I'll do it on the small screen up with the big one.

1:41:23
Yeah, let's go. So I just can't see it. Yeah, no, no worries. I'll change that over. That should change over now. Let's go.

1:41:39
I stopped the share them and I said if I stop the share, and I should do it again. Okay. Yep.

1:41:44
So the little emulator that they do this is called the Giulia emulator, the several versions of this. The little emulator then has got several wires coming out the back of it and inside of it is a

1:41:58
small processor with some chips on it. And

1:42:02
it also comes with the these little dots on the right hand side here.

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On the left hand side you're seeing our personality.

1:42:15
So what you can do there is I get my head out of the way

1:42:21
you can see that now

1:42:22
and those little things they use, you put $1 sold on those to change the personality

1:42:26
of the device. So it's got hundreds of different functions.

1:42:32
And it can do loads of different things and to get it to do each one of those functions. You have to configure it by putting a little dab of solder on those jumper they call them jumpers j one j two, put a drop of solder on the jumpers. Yeah, mine is blockers and yet it's very similar style of thing. When they're intercepting the can but this little engineer those relate to that I get back to the screenshare

1:43:01
bypass. Yeah, that one.

1:43:06
Yeah, products emulator. They've got two styles of emulators there you can see hopefully the Jimmy there and that one can be fitted inside the control unit and you're touching it you can see from that image there to various pins power and ground. And then you may have also

1:43:25
a can high and can low lights had enough noise.

1:43:31
Yeah, and that's that's obviously an option for you.

1:43:35
In some solutions that is quite difficult. The emulator can can be chucked in there for you to see what's what. Yeah, it's it's quite good. But I bet you have a look at that. It does electronic steering lock the LVDS with them replacing those things.

1:43:51
Just change the video back into because I think we're sort of somewhere near here.

1:43:57
Yeah, so have a quick look at that.

1:44:02
Have a look at those guys. Their current demo guys are pretty useful, pretty interesting to talk to.

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Yeah, I'll just come into the chat and have a little look.

1:44:15
So what are they used for how they used to.

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So if you had a replacement ECU,

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and it was very difficult to code that back into that car, the mo emulator can essentially do the communication to and from the car. So you could have a secondhand unit. And in fact, what you'll find is some of the second items on eBay that are that are immobiliser removed, it can either be done with the plumbing thing that we see back there where the EEPROM values are changed, so it doesn't have an immobiliser or that's not possible, we put one of these little emulator kits in

1:44:51
there,

1:44:52
which enable the ECU to be plug and play so you don't have to recode the keys. What they don't tell you obviously at that stage is that the immobiliser is removed and you've got an obvious implication there. We've insurances if the cars fitted with a factory immobiliser and then you've got one of these things, fix

1:45:07
it. You have

1:45:09
to be just mindful that that has gotten patients there but it's used for you know, replacing or overcoming security things in a control unit. I'm going to go back to their back to the share second screen share,

1:45:25
cause they've got another another interesting tool

1:45:29
which we've got this cool, try and find what it's called.

1:45:34
If we go back to their products, but have a look, have a little appeases things you'd have a little look on that a little played see what's what have you fitted on the cure anyone non starter? Yeah, so you can, you can use it to diagnose non stop issues caused by mobilizers. And it runs separate functions. Yeah, you can send the fakes

1:45:54
signal to the mo that's it in essentially fake emos. One of its functions there are lots of functions in there, there is a manual in that. So what you could do guys, if you fancy getting into more detail that have a little look into that website, and they've got a manual that sort of explains some of the key functions. So it can be used in several different modes. One of my favourite modes on the early EDC 15 are you can plug this thing into the data link connector, and you put power ground up it on the two pins for power and ground, you put the green wire in the key line, and then once you plug that in, it sends an immobiliser removal right into the

control unit and then the car would start without the key. So you know, you could you could go around stealing Volkswagens with this thing. It's it's quite it's quite powerful. The thing that the things that it can do, but I would suggest as a bit of homework if you're interested in

1:46:51
that expanding your knowledge a

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bit and have a quick look on that on our website and have a quick look through the

1:46:58
data sheets on the internet. Very good. Yeah, quite good. But yeah, it's useful diagnostically

1:47:03
that you can prove the immobilisers the root cause of your problem. It doesn't tell you which part of the immobiliser but but the applicate. Again, how you need to do that if it's going to involve stripping the ECU to pieces and it's a you know, it's a bit of a challenge you might find a different way of doing it but it's useful for immobiliser removal options. Yeah. And it's got that Lv function as well. Well, it will take over the option of the keyless. So thinking about some crafters and what have you, and sprinters you can put this in place of the lock temporarily even just to get the thing moved. So it's got lots of functions in it. Some of those dodgy ones which you wouldn't get involved with. It does some airbag emulation, seat pad emulations and that type of thing. Again, maybe useful from a diagnostic perspective. But yeah, lots of interesting functions to look out there at LinkedIn to these other mobilizers

1:47:59
Way of Life.

1:48:01
I'm just going to check the chat and see how we're doing. Because I think we're probably coming to a point now where we need to be letting you guys get on with the rest of your days, because we've been going for about an hour and a half now. So, no worries, good to see you, folks. And hopefully everyone is it's all good in the portal side of life that says there's some messages around there. And the fact you've got today with the link sort of shows us working any feedback or comments you've got, let me know. Any other I'm gonna review all of the feedbacks, if you've had a chance to go over to the technical topics page and fill the survey and we'll probably I'll probably put a message up on the portal about what's coming up what we're going to do, by way of upcoming subject matter. I don't quite know how long we're going to be continuing to do this. Well, obviously, as long as the lockdown goes on. Most people are sort of interested in a lot busy working, will keep it going. So really it's a case of making sure if you've had your say On the survey, then we'll pull some content together that works for you.

1:49:05
Yeah, any other questions

1:49:05
with me a message or put in the chat and plans for Thursday? Not sure yet, Mike. So I'm just saying we're going to we're going to

1:49:13
have a quick look through the survey and then make a plan. So

1:49:18
message item, I'll have a look at that. That's interesting.

1:49:22
is interesting. I will if you have any trouble there, yeah. messages on your phone. Okay.

1:49:31
Since we're getting inboxes for you on my pork, okay, I'll have a look at that. Yeah, I'll have a look at that, john. No problem.

1:49:40
No, okay.

1:49:42
All right, guys. Well, if you've had enough for now, I've had enough

1:49:44
and I'm going to get a cup of tea and

1:49:47
stay well keep safe and we'll see you for the next instalment. Thanks, James louisan object just yet.

1:50:01
Thanks, James. No worries, thanks