

Over the time I've been a member here on LZ, I have tried to answer a number of queries about using a .mp3 player with the factory fitted in-car entertainment system and having tried a few different methods I have arrived at using an "in-line wired FM modulator", which is just a small device that can inject your .mp3 signal into the system through the aerial without the usual interference problems associated with the cheapy FM transmitters. The one I used in the past was the VEBA AVFM-MOD01.

There now seems to be a bit of a radio revolution on the horizon; DAB or Digital Audio Broadcasting. Once the nation switches over to DAB and gradually switches off the various FM services, in the next few years by all accounts, there will be even more factory fitted Land Rover radios ending up in the bin.

But wait! What about converting the existing system?

It can be done, and using an external device, quite easily too and for about a similar kind of costs of a new DAB car radio. £150 or so, depending on where you buy it.

This is, and I stress very much my own solution. I know that it probably won't suit everybody but I'm of the mindset of "If it ain't broke, don't fix it". Apart from that, I don't feel the urge to upset the aesthetics or the "feng-shui" of an original Disco 2 dashboard or change it just for the sake of change or loads of bling and different coloured lights. It also has to be said that the setting here is the radio in a vehicle, a steel or aluminium box which can vibrate and rattle, a finely designed and accurately tuned audio theatre it certainly is not. There's really no need for super performance ultra-expensive reproduction systems or bass so powerful that it rattles the body panels. And anyway, I prefer to listen to the music not the equipment!

Whether or not the quality or merits of DAB signals is better or worse than the current VHF FM signals is not the point of this review, it's merely how I've addressed the preparation of my Discovery 2 to meet the future of radio broadcasting.

The DAB converter I've now installed instead of the VEBA above is the Alpine EZi-DAB. The unit is a re-badged "Pure" manufactured device; Pure are a well-known manufacturer in the DAB world.

### **What's in the box?**



The self-install kit consists of the converter unit which can live out of the way under the dashboard and a small, quite smart looking control unit which can be fitted somewhere within easy reach, and because DAB radio works on a different set of frequencies to the FM system a DAB stick-on a window aerial. All the necessary leads and connectors are also included, although there might be a requirement for a couple of aerial plug adapters for ISO and DIN systems. Depending on where the kit is purchased, the stick-on aerial might or might not be included.



*The controller unit*

The signal injection scheme is the same as for a wired modulator, that is, in-line with the FM aerial. The converter unit also has a 3.5mm audio input and a USB socket to which your iPod, iPhone or .mp3 player can be connected, it can power other non-Apple devices such as Samsung. You could even use a USB Flash drive or a hard disk drive. The USB socket is also required for updating the device. There is also a 3.5mm output too for connecting to an AUX input on a suitable head unit. No doubt, with a bit of thought a Bluetooth receiver could be used to provide an audio signal from a phone into the 3.5mm input jack, but since I have to plug a power line into the phone anyway, I might just as well plug in an audio lead too.

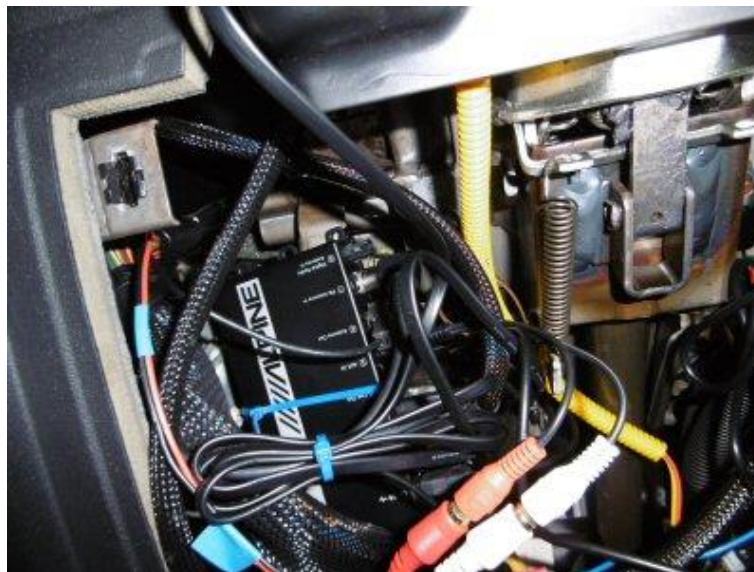


*The converter unit*

The main unit can be set to either blank out any FM signals while the DAB radio is in use and the DAB radio has to be switched off to receive FM programmes, a method which I would advise if the FM aerial is a single whip type or it can be set to mix the DAB and FM signals which should be able to be used where the FM signals are passed through an amplifier such as in the Disco and Rangie.

Colour coding for wiring to an Alpine R990 head unit		
Service	Wire colour	
	Head unit	EZi-DAB unit
Permanent power feed	Purple	Yellow
12 volt Switched power out	Red/blue	Red
Illumination	Red/brown	Brown
Ground	Black	Black

Wiring of the new DAB unit required splicing in (piggy-backing) four wires on the back of the existing head unit: The permanent supply, the switched 12 volts output, illumination and the ground wires. The permanent supply ensures that any settings and channels in the memory remain stored when the unit is switched off. The switched 12 volts is used to activate the DAB converter when the main radio is switched on, this is the supply out of the head unit which is sometimes used to power those automatic aerials and external amplifiers. The converter unit can supply the power for the DAB aerial amplifier if one is used, depending on the type.



*The converter unit in place.*

As supplied, the wiring loom for the power has a plug and socket for connecting into an ISO compatible head unit, but as we all know the original head unit in the Disco 2 isn't ISO compatible, so I simply cut them away which left seven wires to deal with, the three mute wires can just be coiled back as they now serve no useful purpose, which just left the four wires to be spliced into the wiring on the back of the existing head unit. Depending on where the converter unit is placed, there might be a need to extend these four wires. In an attempt to keep the wiring under the dashboard under control and looking a bit tidy I used some black woven sleeving which slips over the wires and once taped at each end forms a neat cable loom. I use self-amalgamating tape for this because it doesn't leave a sticky residue. Do take care when securing the converter unit under the dashboard, apart from the vehicle

fuse-board, there are some not insignificant mechanical assemblies under there too, things like the brake pedal and steering column.

### **On the question of aerials.**

The stick-on DAB aerial might present some problems for some users, it's possible but not recommended that it be fitted on a heated windscreen due to possible screening effects. The stick-on aerial is supplied with 2.5 metres of cable attached, but in the Disco with the aerial fitted to the front edge of the rear side window it's about half a metre too short so an extension cable was fitted. The EZi-DAB does have a facility to use the existing FM aerial and since the DAB frequencies are around 220 MHz (DAB+ frequencies are up around 1000 MHz but it's unlikely that they'll be used in the UK in the near future.) there's every possibility that it will work so that will be tried first. If that fails to provide satisfactory results, the next aerial to be tried will be the stick-on type on the inside of the off-side back window, running the cable which is quite thin behind the headlining above both doors and down behind the "A" post trim to the main unit under the dashboard. The R990 "Hi-line" head unit in the Disco 2 has two aerials plugged into the back; the smaller one is the medium/long wave aerial and the larger one is the VHF FM aerial, this is the one which the EZi-DAB converter connects into.



Another aerial type which might be worth looking at is a DAB "shark fin" roof mounted job. It's designed for the digital frequency bands and already contains an amplifier. The amplifier is usually powered by 12 volts, unlike the stick-on type which is powered by 5 volts. A separate supply can be arranged from the switched 12 volts available at the head unit and the DAB converter is then set to unpowered DAB aerial. I know that sounds a bit counter-intuitive, but when the stick-on aerial is used, the 5 volt supply is sent up the aerial cable instead of using a separate supply. Be warned, there are shark fin aerial for under twenty quid but these are for FM only not DAB.



I wasn't sure which aerial would be the best for my situation so at the same time as running in the cable for the stick-on aerial I installed the cable and power wire for the shark-fin just in case I needed it. The extra cost of a tenner for a made up six metre lead and no need to get involved with trying to get another set of wires in seemed like a good idea. One other lead which I did find useful was a "micro USB" extension lead, it allowed me to move the little control unit so that I was more able to read while I was altering the various settings.





*The controller in place*

I tend to think that for some but not all people this might be a reasonable way forward, it future-proofs your listening with the latest DAB radio while still retaining your existing FM system, whether it's original or aftermarket. By being able to connect a mobile phone it also gives you the capability of connecting to internet radio and streaming services or your own .mp3 playlists and since the only major change to the existing ICE system is a "loop through" in the aerial line, the original remote volume controls will continue to work as they were intended, as does the CD auto-changer/player, amplifier and even the tape player and medium and long wave steam wireless.



*If you have RDS then your head unit will show that it's tuned to the EZi-DAB*

### **Settings to check (Personal preferences)**

Set to receive through the FM aerial. Initial setting until the provided aerial is installed.

Set Aux audio gain to +3

Set for FM + DAB mixed reception.

Set Button colour for green lighting.

Set Backlight for Timed Dim.

Set FM transmit frequency for 87.9 MHz in my case.

### **Equipment list and url's (Ideas, not necessarily recommended)**

<http://www.amazon.co.uk/JUSTOP-BTR006-Bluetooth-Wireless-Universal-Black/dp/B005NDDEVQ>

<http://www.amazon.co.uk/Veba-Modulator-transmitter-AVFM-MOD01-iPhone/dp/B00FV82TMS>

<http://www.alpine.co.uk/p/Products/dab3842/ezi-dab>

<http://www.carcommunications.co.uk/car-accessories/fitting-accessories/dab-antenna-aerials/alpine-interior-windscreen-mount-dab-antenna-kae-5da2>

[http://www.alpine-europe.com/fileadmin/user\\_upload/manuals//car\\_audio\\_manuals/EZi-DAB/OM\\_EZi-DAB\\_EN.pdf](http://www.alpine-europe.com/fileadmin/user_upload/manuals//car_audio_manuals/EZi-DAB/OM_EZi-DAB_EN.pdf)

<http://www.ebay.co.uk/itm/1M-Micro-USB2-0-Type-B-Male-To-Female-Extension-Charging-Data-Cable-Charger-Lead-/221734300599?hash=item33a064ebb7:g:bcoAAOSwBLIVH4V8>

At this time, up in my little valley DAB is gradually finding its way, but only the BBC stations are available at the moment, so I'm not gaining anything yet. Reception of those stations seems quite satisfactory using the FM aerial and amplifier system of the Disco. I will have to drive to a place where I know that a proper DAB signal can be received and then I'll try retuning the converter. Time will tell.

Operation of my Samsung S2 mobile phone as an .mp3 player works just as it did when the VEBA unit was used. By taking the power for the phone from the USB socket on the EZi-DAB unit, there seems to be no need for noise suppression. Those cheap little USB charger devices that plug into the cigarette lighter socket have been known to cause problems with the EZi-DAB in the past.

The location of the controller might seem restricted but since I tend not to start changing channels whilst I'm driving, I don't see that as a problem, no doubt other users will have other ideas.

The actual installation of the aerial wasn't quite as involved as I thought it might have been. I ran in two coax cables and a single wire, the reason being that if the stick-on aerial wasn't up to the job then I would be looking at option "C", a shark-fin jobby on the roof and I would at least have the required cables in behind the headlining up to the rear tailgate door. To run a wire from under the dashboard to above the rear tailgate comfortably will take about 5 metres.



The aerial was stuck on the inside of the window on the off-side of the vehicle, the MW/LW aerial is built into this window, the VHF/FM aerial is in the nearside window.

The cables I took up the behind the trim on the top half of the "A" post and then it was just a case of poking them up behind the headlining. Had to take off all the 'andles (and the fings wot 'eld the candles) so that I could push the cables above the handle mounts. Didn't have to remove the "B" post trim, just eased it away a bit with a couple of screwdrivers.

The rear "D" post trim casing was almost completely removed, apart from undoing the rear seatbelt mount to allow me access to the metalwork around the window. This is necessary because the aerial cable has a "connection" which has to be stuck to the bodywork. I say that in quotes because there is no physical connection, no scraping of paint or cleaning under bolt heads; it's all done using the magic of capacitive coupling.

Once everything was in place and the excess cabling tied in it was a case of as the Haynes manual says "a reverse of the removal process".

Connecting the FAKRA aerial plug and resetting the aerial source facility on the EZi-DAB to a powered connection provided an immediate improvement in the signal levels received. Even up in the valley it looks like I can receive quite a few 40 DAB channels now. A local test drive did show that the reception dropping out, but that cleared up as I left the valley. The local transmitter at Blackmill is slated to be added to the DAB network "soon".

Currently it's one of the major disadvantages with DAB, the patchy coverage, in this neck of the woods, the main DAB transmitters are at Wenvoe on the west end of Cardiff, St. Hilary near Cowbridge and Kilvey Hill near Swansea, so the main coverage which is very good is aimed at the South Wales coastal plain and the M4 corridor. It's good in Bridgend too but once you get into the valleys there are no repeater transmitters and both coverage and performance drop off dramatically. How DAB will behave where you live you'll have to find out for yourself.

A coverage map. <https://ukfree.tv/transmitters/dab>

Passing the Wenvoe TV transmitter on the A48 road to Cardiff and the entire system does pick up some interference, but that's nothing new, even old fashioned medium wave steam wireless sets used to that too.