

### **Inoperability of Remote Due to Interference:**

In the UK, a different frequency (433 MHz) from that in the US (315 MHz) is used for remote locking and several owners have experienced trouble using the remote to lock or unlock the vehicle when parked in places where a lot of radio interference is present, such as at airports. Joe Jeffrey reports a similar problem at his Petrol/gas filling station where there



appears to be a magnetic field generated by an LPG pump which seems to interrupt not only the handset signaling the locks but also the handset talking to the BeCM when inserted into the ignition switch, preventing the car from starting. (He managed to get around this problem by manually locking the vehicle with the key in the door lock when he gets out at the station and then everything works fine when he gets back in).

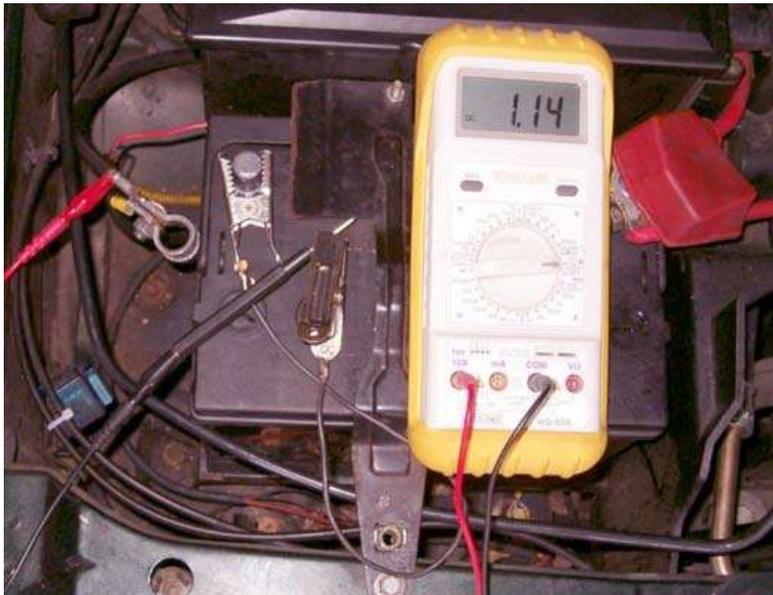
The same radio frequency is also used for many remote control devices in Europe and Australia and there is the possibility that these devices may cause interference. A partial fix became available in 2004 from the UK dealer network whereby the stock RF receiver (Part # AFR1953) was superceded by a new one (YWY500010) which was less subject to interference, but did not completely cure the interference problem. Accordingly, this has since been superceded by an even newer design, part number YWY500170. Owners with this latest update have not reported any further problem.

***Photo at Right: RF Receiver for alarm system, located on top of rear seatback support under right rear parcel shelf. It is accessed by removing the parcel shelf trim. Rear seatback latch is at top right of photo. Note connection to window antenna at bottom of picture. Photo courtesy of Ron Beckett.***

### **Unexplained Battery Drain:**

Several owners have complained of unexplained battery drain when parked in certain areas like airports where a lot of RF energy is present, or in large parking lots where other vehicles with remote locking systems come and go. The problem is that the radio interference (and/or radio frequency energy from other peoples' remote locking handsets) gets received by the RF receiver which "wakes up" the BeCM from sleep mode, increasing its current drain to about one amp instead of a few milliamps. Paul Jameson of [Avon Diagnostics](#) reports that all remotes use the same frequency, and the Range Rover system does not bother to determine whether the code contained in the RF signal is a Range Rover one before waking up the BeCM. The battery can easily be dead after a few days of this. No fix seems to have been produced yet -- if you hear of one please [email me](#). Meanwhile Jeffrey Upton came up with his own solution (he lives near Logan Airport in Boston and suffered this problem frequently). He disconnected the leads between the window RF antenna and the receiver. In this condition the remote still works fine as long as you are within a couple of feet of the vehicle, but the effect of external radio interference is eliminated! Andrew Walne came up with an even better idea -- installing a switch to control the RF receiver. See much more info on mysterious battery drain and Andy's cure on the [Mysterious Battery Drain Page](#).

## **Mysterious Battery Drain on a 4.0/4.6: Diagnosis and A Novel Cure**



### **Introduction**

[Andrew Walne](#) was one of the many owners who has experienced mysterious battery drain on his 1996 4.6HSE. After finding the source of the problem was, as usual, the BECM being "woken up" by

spurious radio transmissions, Andy cured the problem by installing a switch so he could turn off the RF receiver at will. He was kind enough to share his story with readers of Rangerovers.net so we can all benefit from his experience.

***Photo at right: Andy's multimeter registers over an amp of drain with the BECM awake.***

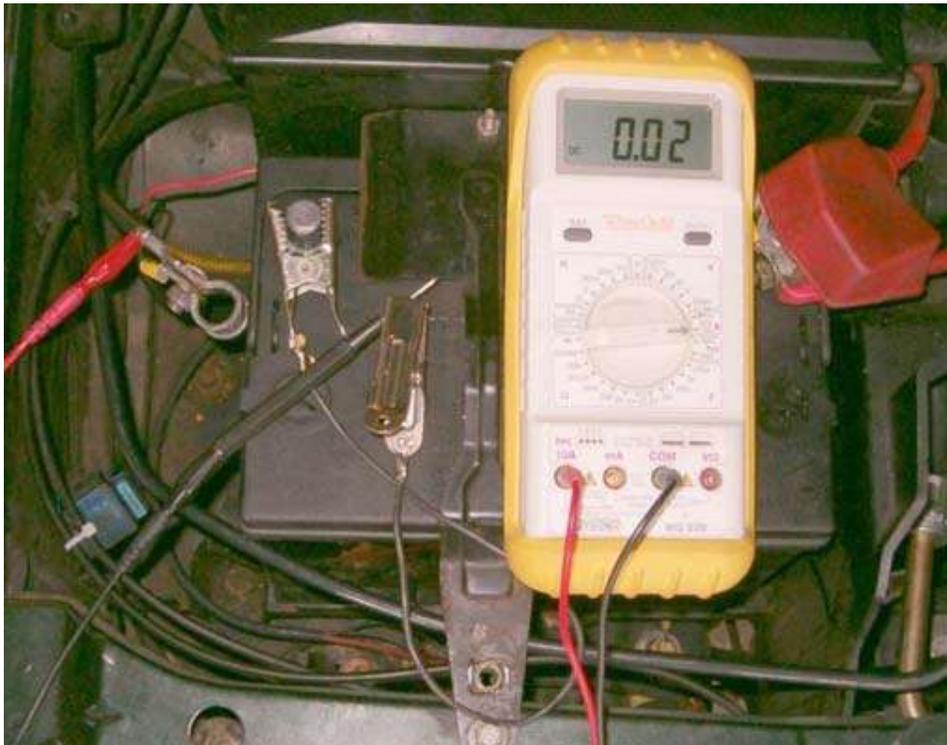
## Problem

A brand new battery was unable to turn over the engine after standing for 2 days, any longer and lights, windows etc. did not work, and occasionally there was a completely dead battery. When I used Rangey every day there was no problem. This was caused by the BeCM sleeping for 20 seconds, waking up for 2 minutes, sleeping again for 20 seconds, 24 hours a day, continuously for most of the 3 months she has been in my possession.

## Solution

To establish the BeCM activity I used a multi-meter between the battery negative terminal and the negative lead to measure current drain. When the Rangey was shut, locked and alarmed the current drain was about 1.1A initially, then dropped to 0.57A and after 2 minutes went down to 0.02A (see photos above and below of the drain with the BECM awake and asleep respectively). This is what Rangey should do and she had no traceable fault, as was confirmed by a Landrover main dealer. (It seems that the selected gear position LED glows very faintly as an indicator that the BeCM is awake).

***Photo: Andy's multimeter registers .02 amps (20 mA) with the BECM asleep.***



However, when Rangey was at home, after a further 20 seconds the BeCM woke up and the cycle started all over again without any physical action on my part, the only time she slept for any length of time was when the RF receiver was disconnected which implied the RF receiver was waking it up. The aerial was disconnected, a new receiver was fitted but still a radio signal was causing the BeCM to stay awake. Using a radio frequency scanner with a strength meter, I found a strong, regular pulse from somewhere near to my home being transmitted every 46 seconds on 433.875Mhz, close to the remote key frequency of 433.92Mhz. I was able to trace this signal to a faulty window sensor for a wireless burglar alarm on a neighbour's house further up the road. When the alarm sensor batteries were changed the signal ceased and Rangey has slept soundly ever since with no more battery drain problems.

Until I found the problem I fitted a concealed double pole switch to turn off the RF receiver and locked up using the key. According to the handbook the receiver draws current through Fuse 15 but when that was taken out the receiver still worked so it had to be double pole. If Rangey is to be left for more than two days, I can leave her and know that the battery will be OK, albeit without the volumetric alarm armed.

## Conclusions

Before you buy a new battery, disconnect the RF receiver's 3 pin multi-plug and check with a meter if there is no other obvious reason for a flat battery. The multi-meter can be connected without disconnecting the battery. Make a short lead with a crocodile clip at each end, loosen the negative battery terminal, clip the positive from the meter to the negative battery lead, clip one end of your new lead to the meter negative probe and use the probe to touch the bottom of the negative battery post, take the battery lead away and clip the other end of the new lead to the negative battery terminal. Make sure the meter is set correctly before connecting and leave the driver's door open in case, like me the first time I did this, you break the circuit for too long and Rangey locks up.

## Common RF Sources that Wake Up the BeCM

Andy reports that the RF receivers in cars are all built to a price. "I have heard of one in a prestige car which is made for the equivalent of 10 pence, therefore they are susceptible to interference from a wider waveband than it's key fob transmits. This means that here in the UK there are several things that could cause the BeCM to wake up and drain the battery. Radio Amateurs in the UK can transmit on the same frequency as car key remote controls and the power they are allowed is the same at 250m from the car as a key remote is at 5m. I have heard of numerous car owners on a housing estate who could not use remote keys because a radio amateur had set up a different aerial. I have heard of a garage that could not use remote keys for cars on the forecourt for hours after the postman rang the faulty wireless doorbell switch at a nearby house. I have heard of someone who pressed the remote for his electric garage door before he reached his house and unlocked his neighbour's car every night. Several everyday items that do not need a radio licence also use 433Mhz in the UK. For example, through trial and error, I have found that in normal use a wireless doorbell can wake Rangey, a wireless weather station transmits a signal every few seconds that can keep her awake all the time at up to 150m, and a radio release for a clay trap will wake her at up to

250m. All of these and more would only wake a BeCM if one was unlucky enough to be within range given the power and distance as well as the frequency being close to that required by the RF receiver".

Alistair Brown of Thirsk, Yorkshire, found his battery drain problem started when his neighbour got a wireless broadband Internet connection.

## Official Fixes:

Note also that Land Rover belatedly recognized this problem and has had two attempts at curing it. A partial official fix from Land Rover became available in 2004 from the UK dealer network whereby the stock RF receiver (Part # AFR1953) was superseded by a new one (YWY500010). Gunnar Arthursson reports that this receiver was less subject to interference, but did not completely cure the interference problem. Accordingly, it has since been superseded by an even newer design, part number YWY500170. Gunnar reports that Owners with this latest update have not reported any further problem.