

[News story: GAD and ERNIE 5](#)

GAD helps ensure Premium Bond draws remain random

Statistical tests carried out by experts at the Government Actuary's Department (GAD) help ensure Premium Bond winners are chosen fairly!

The power behind the generation of the random numbers in each monthly draw has recently been upgraded to a new version called ERNIE 5 (or Electronic Random Number Indicator Equipment).

So, before the launch GAD carried out independent statistical tests on the ERNIE 5 machines to reassure National Savings and Investments (NS&I) that the draw output appeared random.

Cash prizes

Premium Bonds from NS&I do not pay interest, but investors get the chance to win a range of cash prizes in monthly draws. These include two £1 million prizes distributed every month. These winnings are free of income tax and capital gains tax. People can withdraw their money whenever they like. As NS&I is backed by HM Treasury, all money invested is 100% secure.

Lightning speed

There have been 5 generations of ERNIEs with the first one being invented by a Bletchley Park code breaker in 1956. The new ERNIE 5 is based on quantum technology that uses light photons. This allows the random numbers for a monthly prize draw to be generated far quicker than had previously been possible.

Assessing randomness

Since 1970 the Government Actuary has undertaken independent and robust statistical testing to assess the randomness of each monthly draw. While it's not possible to confirm absolute randomness, the Government Actuary provides a monthly certificate to NS&I stating there is no reason to believe the output from ERNIE is not random. Monthly draw prizes cannot be paid until this certificate is issued.

Testing ERNIE 5

GAD assessed a large number of sample draws produced by ERNIE 5. It was vital to confirm these sample draws would pass the standard monthly randomness tests required to issue the draw certificates. A wider range of checks was undertaken to provide additional reassurance for each aspect of the output and these were all completed successfully.

Strength to strength

The first monthly Premium Bond draw using ERNIE 5 was in March 2019. GAD will continue to independently test the monthly draw output, issuing confirmation certificates as appropriate, after which prizes can be paid to the winners.

Further details on [Premium Bonds and ERNIE 5](#) are available at NS&I's website.