

NAG Toolbox for MATLAB

g05ew

1 Purpose

g05ew returns the next term from an autoregressive moving-average time series using a reference vector set up by g05eg.

2 Syntax

```
[result, r, ifail] = g05ew(r, 'nr', nr)
```

3 Description

g05ew generates the next term in the autoregressive series and stores it in a circular buffer in the reference vector. It then applies the moving-average summation and returns the result. This is equivalent to the ARMA model described under g05eg.

4 References

Tunncliffe–Wilson G 1979 Some efficient computational procedures for high order ARMA models *J. Statist. Comput. Simulation* **8** 301–309

5 Parameters

5.1 Compulsory Input Parameters

- 1: **r(nr)** – double array
The reference vector as set up by g05eg.

5.2 Optional Input Parameters

- 1: **nr** – int32 scalar
Default: The dimension of the array **r**.
This should be the same as in the preceding call of g05eg.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

- 1: **result** – double scalar
The result of the function.
- 2: **r(nr)** – double array
The updated reference vector.
- 3: **ifail** – int32 scalar
0 unless the function detects an error (see Section 6).

6 Error Indicators and Warnings

Errors or warnings detected by the function:

ifail = 1

nr has been changed or **r** corrupted since it was set up by g05eg, or since its last use by g05ew.

7 Accuracy

Not applicable.

8 Further Comments

The time taken by g05ew is of order (**na** + **nb**), where **na** is the number of autoregressive coefficients, and **nb** the number of moving-average coefficients, in the underlying model.

The comments made in Section 8 of the document for g05eg, concerning the use of g05cb, g05cc, g05cf and g05cg, must be read before using this function.

Although the reference vector may be copied like any other array, inexperienced users are strongly advised not to keep more than a single copy. Copying it at any point has the effect of starting a new, independent time series with an identical history. This facility may be useful, but it is clearly a fruitful source of confusion if misused or used by accident.

9 Example

```
e = 0;
a = [0.4;
     0.2];
b = [1];
nr = int32(9);
g05za('O');
g05cb(int32(0));
[r, var, ifail] = g05eg(e, a, b, nr);
[result, rOut, ifail] = g05ew(r)
```

```
result =
    2.4084
rOut =
    2.5000
    1.5000
    8.5000
         0
    0.4000
    0.2000
    1.0000
    2.4084
    1.3092
ifail =
         0
```