12[L, M].—R. HENSMAN & D. P. JENKINS, *Tables of* $\frac{2}{\pi} e^{z^2} \int_z^\infty e^{-t^2}\, dt$ *for Complex z*, Royal Radar Establishment, Malvern, Worchestershire, England. Deposited in UMT file.

The function $\frac{2}{\pi} e^{z^2} \int_z^\infty e^{-t^2}\, dt$ has been tabulated to 6 decimal places for 0(0.02)2.00 in the real part of z and 0(0.02)4.00 in its imaginary part, and also for 0(0.1)10.0 in both real and imaginary parts. Second differences are given and second-difference interpolation in the appropriate table gives 6-decimal accuracy for the whole range covered. The error in using linear interpolation need not exceed a unit in the fourth decimal.

AUTHORS' SUMMARY

13[L, M].—A. V. HERSHEY, *Computing Programs for the Complex Exponential Integral*, NAVORD Report No. 5909, NPG Report No. 1646, U. S. Naval Proving Ground, Dablgren, Virginia, June 1959, iii + 16 p. Figures and tables. 27 cm. Astia Document Service Center, Armed Services Technical Information Agency, Arlington Hall Station, Arlington 12, Va.

In this report there appears a detailed discussion of the use of asymptotic series with remainder in the evaluation of the complex exponential integral on the Naval Ordnance Research Calculator (NORC). Brief descriptions are also given of two NORC subroutines for the calculation of the exponential integral and the sine and cosine integrals of a real argument.

A series expansion of the remainder of the asymptotic series is presented, and is used to evaluate the remainder with improved accuracy.

The author also describes the construction of a rational approximation to the exponential integral that is valid over the negative half of the complex plane outside the unit circle. In appended tables appear approximations to 13S of the coefficients of two polynomials of the fourteenth degree whose quotient gives values of the function $ze^{-z}Ei(z)$ to within a maximum relative error in the absolute value of $2 \cdot 2 \times 10^{-13}$.

The appendix also includes a table of values to 13S of the real and imaginary parts of $Ei(z)$, corresponding to $x = -20(1)20$ and $y = 0(1)20$. These results were obtained on the NORC by means of double-precision arithmetic, using sixteen-point Gauss integration over each unit interval, beginning with $x = -100$, where the value of the integral was considered to be negligibly small.

Comparison by the reviewer of these data with corresponding entries in an extensive earlier set of tables [1], carried to 6D and 10D, revealed only three instances of rounding errors in the latter, all of such size as to lie within the guaranteed limit of a unit in the last decimal place.

J. W. W.

1. NBS Applied Mathematics Series, No. 51, *Tables of the Exponential Integral for Complex Arguments*, U. S. Government Printing Office, Washington, D. C., 1958. See also *MTAC*, v. 13, 1959, p. 57–58.