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63-3-2

TM-(L)-721/018/00

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TECHNICAL MEMORANDUM

(TM Series)

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SCF Computer Program Systems Manual
General Purpose Satellite Programs
Correct Apparent Elevation for Refraction (RC)

by

Nancy Speer

28 January 1963

Approved

J. D. Marioni

SYSTEM

DEVELOPMENT

CORPORATION

2500 COLORADO AVE.

SANTA MONICA

CALIFORNIA

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SUBROUTINE IDENTIFICATION

- A. Title: Correct Apparent Elevation for Refraction (RC) --
Ident. F99, Mod. NS.
- B. Programmed: J. C. Lenhoff, Lockheed Missile and Space Division
- C. Revised and Documented: 9 November 1962, Nancy Speer, System
Development Corporation.

PURPOSE

RC corrects for refraction any number of apparent elevations which are within the range 0 to 2π .

USAGE

- A. Calling Sequence:
L RTJ RC
L+1 ZRO EA
 ZRO N
L+2 NORMAL RETURN

where: EA = the location of the first elevation to be corrected.
N = the number of elevations to be corrected.

- B. Inputs:
The input elevations must be expressed as floating-point radians within the range 0 to 2π .
- C. Results:
Each corrected elevation, as a radian value in floating-point format, is placed in the location of the input elevation. The correction factor is stored in the first cell of COMMON.

RESTRICTIONS

- A. Accuracy
The results of RC fall well within the requirement of accuracy to the fourth decimal place. A more definite statement of accuracy can not be made because accuracy varies greatly depending on the magnitude of the input and its proximity to any pair of entries in the two tables used for interpolation.

B. Input Limits

Inputs must be within the range 0 to 2π . Inputs outside these limits will not be reduced properly and will cause an error return from INDIV which, in turn, causes a jump to SUBERR and consequent halt.

C. Environment

RC uses the subroutines INDIV and SUBERR, and the Reference Pool. Index registers 1 and 2 are saved, used, and restored.

TIMING

Maximum $243.6xN + 101.4$ microseconds plus time for INDIV
 Minimum $198.0xN + 101.4$ microseconds plus time for INDIV
 where N = number of elevations

STORAGE REQUIREMENTS

Storage Allocation

Program	36_{10} cells
Constants	122_{10} cells
Temporary Storage	1 cell
	—
	159_{10} cells

REFERENCES

- A. IMSC-447578, Page 55.05.13, Systems Manual Subroutine Description of RC.
- B. TM-(L)-715/025/00, Utility Program Descriptions, Milestone XI, Interpolate by Divided Differences (INDIV). (AFCPL Catalog Number 75024)
- C. IMSD-447578, Page 50.06.01, Systems Manual Subroutine Description of SUBERR.
- D. TM-714/032/00, General Purpose Satellite Computer Program Descriptions, Milestone XI, Correct Apparent Elevation for Refraction (RC), 9 November 1962. (AFCPL Catalog Number 75599)

28 January 1963

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System Development Corporation,
Santa Monica, California
SCF COMPUTER PROGRAM SYSTEMS MANUAL
GENERAL PURPOSE SATELLITE PROGRAMS
CORRECT APPARENT ELEVATION FOR
REFRACTION (RC).
Scientific rept., TM(L)-721/018/00,
by N. Speer. 28 January 1963, 3p.
(Contract AF 19(628)-1648, Space
Systems Division Program, for Space
Systems Division, AFSC)

Unclassified report

DESCRIPTORS: Programming (Computers).
Satellite Networks.

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