

## Erroneous N60 R1 Scaling in Luminary 163

- References: (a) Revision 163 of AGC Program Luminary, dated 29 April 1970, received 18 May 1970.
- (b) TRW A-201, "Questionable Items in Luminary 130 (H2) Program," dated 18 November 1969.

A review of reference (a) has revealed that not only has the erroneous output scaling constant for R1 of N60 been retained from the H2 program (as reported to MSC in reference (b)), but also the input scaling constant, previously compatible with the (wrong) output scaling constant, has now been made too large by a factor of roughly 13500. Although the input scaling constant is unlikely to be employed (since R1 of N60 is "forward velocity", normally an output parameter), the effect of the grossly excessive scaling constant would be such as to cause an operator error (due to overflow) for most input numbers that might be attempted.

As discussed in reference (b), the correct output scaling constant should be  $5.571 \text{ E-5 B14}$ ; the value in the listing (line 2334 on page 315 of reference (a)) is  $5.517 \text{ E-5 B14}$ . The effect of the transposition of the last two digits means that the display on the DSKY would be about 1% low (perhaps not of serious concern, since the least increment on the DSKY is 0.1 fps, while on the data is over five times coarser).

The updated input scaling constant is (line 2234 on page 314 of reference (a)):

$5.571 \text{ E-5 B14}$

This constant, in the input scaling table, bears a fantastic "coincidence" to what should appear in the output scaling table instead. The input scaling constant in the previous program was  $0.18125 \text{ E5} \times 2^{-28}$ .

It would seem appropriate that MSC determine:

- a) The authorization for changing the constant from the H2 program value.
- b) The checks made of the change by manual means.
- c) The test plan run that was designed to validate the change.
- d) The individuals responsible for review of the plan and results.
- e) Improvements to be made to configuration control procedures to avoid such events in the future.

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