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TM-(L)-734/026/00

TECHNICAL MEMORANDUM

(TM Series)

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Systems Division Program, for Space Systems Division, AFSC.

1604 Simulation Program Descriptions Milestone 11	SYSTEM
Simulation Data Generation Control Routine (SDGC)	DEVELOPMENT
by	CORPORATION
G. A. Madrid	2500 COLORADO AVE.
15 March 1963	SANTA MONICA
Approved	CALIFORNIA
J. B. Munson	

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1.0 IDENTIFICATION

1.1 Title

Simulation Data Generation Control Routine (SDGC)

Ident: KO⁴, Mod. 04

1.2 Programmed

12 December 1962, G. A. Madrid, System Development Corporation

1.3 Documented

12 March 1963, G. A. Madrid, System Development Corporation

2.0 PURPOSE

SDGC is used by SIPSA as a subroutine to initiate the ordered execution of the data generation subroutines pre-scheduled by SIPSA, to update the system time counters, and to pack and record the data outputs from the executed subroutines in the formats requested.

3.0 USAGE

3.1 Calling Sequence

L	SLJ	4	SDGC
L+1	NORMAL RETURN		

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3.2 Parameters

SDGC obtains its input parameters by extracting the contents from the following locations in SIPSA:

<u>Location</u>	<u>Contents</u>
(SIPSA + 14) SIMPAR.....	A five-word table containing the SIPSA input parameters.
(SIPSA + 152) PASSTIME....	Length of generation in seconds.
(SIPSA + 165) SCHED.....	An 11-word table containing the addresses of the subroutines to be executed in the order of operation.
(SIPSA + 203) TLMODE.....	The telemetry mode specified for SIPSA.

3.3 Error Printouts and Operator Action

Two types of errors may occur in SDGC. Their printouts and meaning are as follows:

- a. THE OUTPUT TAPE UNIT IS NOT READY. ENABLE UNIT LISTED BELOW THEN HIT START.

This error occurs if the output tape unit is not ready. The operator must enable the unit and hit start to continue.

- b. TOO MANY WORDS ARE BEING GENERATED. TO IGNORE THE PCT CREATING THE OVERLOAD, SET KEY 2 THEN START.

This error occurs if more than 75 words have been selected for generation in any one pseudo second. If it is desirable to continue without the excess data, set SLJ Key 2 and hit start to continue.

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3.4 Tape Assignments and Usage

The tape assignments are dependent on the units specified on the SIPSA function card (TM-(L)-734/025/00). Unit number 3 is reserved for MTCII output and BCD output from the SIPSA System. Unit number 1 is reserved for the master tape containing the SIPSA System. At the CPDC and STA, tape units 2, 4-12 may be specified as parameters on the SIPSA function card.

3.5 Control Card Format

SDGC is referenced by SIPSA when it reads a Data Generation Control Card, after having read a START Card and one or more data request cards. The Data Generation Control Card (GENERATE) has the following format:

GENERATE	P ₁
----------	----------------

<u>Columns</u>	<u>Content</u>	<u>Meaning</u>
1-8	GENERATE	Name of the generation request function.
10-13	P ₁	The number of seconds of data which will be generated for recording on the output tape. If this field is left blank and a Reset Tape is being referenced by SIPSA, data will be generated for the entire pass. Otherwise, this value or the duration will be used, whichever is least. If no Reset Tape is used, this field <u>must</u> not be blank or zero.

Since SIPSA reads this card, the P₁ field is processed in SIPSA. However, when SDGC is referenced, this value (PASSTIME) is extracted from the SIPSA Routine.

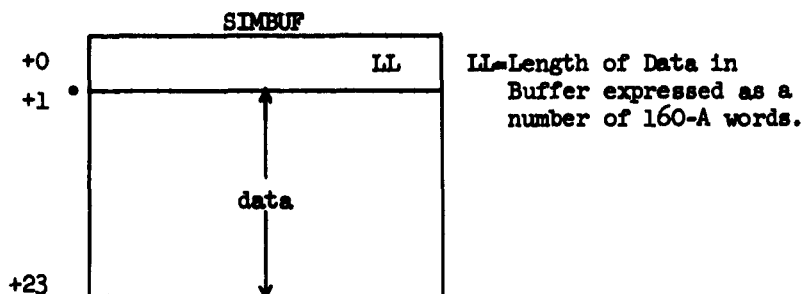
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3.6 Input or Output Data

The input data to SDGC originates from the various data generation subroutines being executed. This data is transmitted to SDGC via a relocatable buffer area (SIMBUF, TM-(L)-734/030/00). The first word of this buffer contains the length of the message in the buffer. If the message is from a simulated telemetry computer, this length is complemented. The data in the buffer uses the message formats described in the Bird Buffer Combined Milestone 3 and 4, TM-(L)-834/000/01A.



The output data from SDGC consists of the same data contained in SIMBUF, except that in the case of a transfer tape selection (FS), only words, 1-8, are recorded on the output tape. For a BB Tape, the data from each subroutine on the schedule is accumulated as emanating from a telemetry or tracking computer at a tracking station. Each time the schedule is finished, this accumulated data is recorded in the format into which it has been packed. This packing area (DATA) is internal to SDGC. Its format is as follows:

STATION DATA RECORD (40, 48-Bit Words)

<u>6-Bit Character</u>	<u>Content</u>
1-2	0002
3-4	Number of simulated 160-A data words generated for the telemetry computer.

<u>6-Bit Character</u>	<u>Content</u>
5-6	Number of simulated 160-A data words generated for the tracking computer.
9-160	Area containing sequentially packed telemetry messages.
161-312	Area containing sequentially packed tracking messages.
313-320	System time in seconds.

3.7 Key Settings

Set SLJ Key 2 if it is desired to continue processing after an error stop caused by error b, Section 3.3.

4.0 METHOD

After the initialization request card and one or more data generation request cards are processed by SIPSA, a schedule is set up containing the addresses of the data generation modules that are to provide the simulated data requested. The GENERATE Card, which is read next, causes SIPSA to reference SDGC as a subroutine. SDGC then extracts the parameters necessary for its operation from their location in the SIPSA Control Routine and proceeds to execute, sequentially, the ordered addresses in the schedule. If a transfer tape is being prepared, the System Output Buffer (SIMBUF) containing the message prepared at that execution by the generation subroutine, is recorded on the output tape. This is done after the execution of each subroutine in the schedule until the generation time has expired. If a SIMSTN* Input Tape (BB) is being prepared, the data from each module is unpacked from

*SIMSTN is the Augmented Tracking Station Simulation Program. Refer to documents TM-(L)-734/015/00 and TM-(L)-734/033/00.

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SIMBUF and packed sequentially into an area of another buffer (DATA) corresponding to the nature of the message (i.e., tracking or telemetry). This cumulative buffer is then recorded after the execution of all of the generation subroutines on the schedule. Generation continues until the designated duration has been reached.

SDGC will produce either a tracking or vehicle time record for an FS Tape or a data record (Type 2) for a BB Tape. Completion of the generate function returns control to SIPSA, which proceeds to read the next input sequence. If these inputs are more data requests, the generation cycle will be repeated. If they are termination requests, SIPSA will end all operations.

5.0 RESTRICTIONS

5.1 Minimum Hardware or Machine Components Required

Refer to Section 5.0 of TM-(L)-734/025/00, SIPSA Milestone 11.

5.2 Subroutines Required

SIPSA	SUBERR
SEAPA	FIX
SDOR	FLOATBIN
SCGR	STCA
STGR	STCB
SRGR	STCC
SIMBUF	STCD
TAPE	STCE

5.3 Limits on Input and Output Data

The input data in SIMBUF is limited to a maximum of 75, 160-A words (12-bit words), and the output data in DATA or SIMBUF is likewise limited to this amount.

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5.4 Reference Pool Items Set or Used

ST.....Station Number

6.0 TIME REQUIREMENTS

The time required to operate SDGC is in direct relationship to the data being generated, length of pass, and the type of output tape being produced. An estimate of time of operation for the SIPSA System may be found in TM-(L)-734/025/00, SIPSA Milestone 11.

7.0 STORAGE REQUIREMENTS

	<u>No. Registers In Octal</u>	<u>No. Registers In Decimal</u>
Instructions	350	232
Storage	<u>121</u>	<u>81</u>
	471	313

8.0 VALIDATION TESTS

The inputs to the SIPSA System, as described in TM-(L)-734/025/00, SIPSA Milestone 11, were used as validation inputs for SDGC. The output from SDGC on magnetic tape showed that the data was processed in accordance with the design specifications. A complete description of the tests is found in the SIPSA Milestone 11 document.

9.0 REFERENCES

9.1 The Control Routine of the Simulated Input Preparation System for the Augmented SCF Environment at the STA and CPDC (SIPSA), Milestone 11, TM-(L)-734/025/00, System Development Corporation, 15 March 1963.

9.2 Bird Buffer Combined Milestone 3 and 4, TM-(L)-834/000/01A, System Development Corporation, 11 February 1963.

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9.3 Operating Instructions for the Augmented Tracking Station Simulation Program, SIMSTN, Milestone 7, TM-(L)-734/033/00, System Development Corporation, 20 February 1963.

9.4 Computer Design Specifications for the Simulation of the Augmented SCF Environment at the STA and CPDC, Milestone 4, System Development Corporation, TM-(L)-734/015/01A, 9 January 1963.

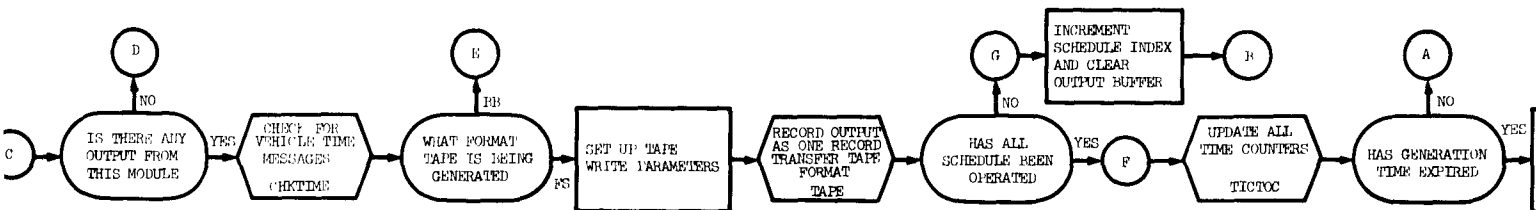
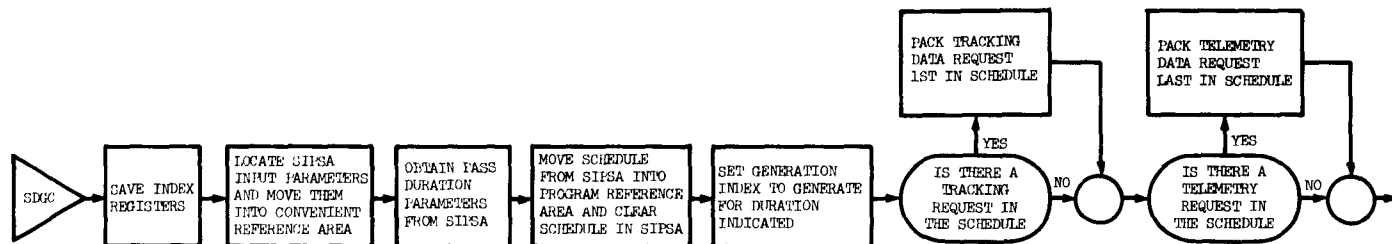
10.0 FLOW CHARTS

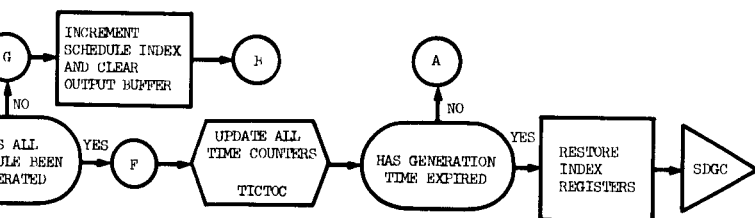
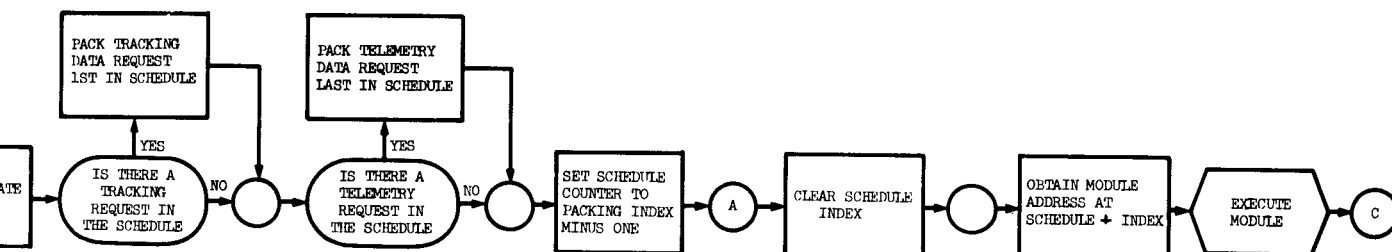
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APPENDIX A

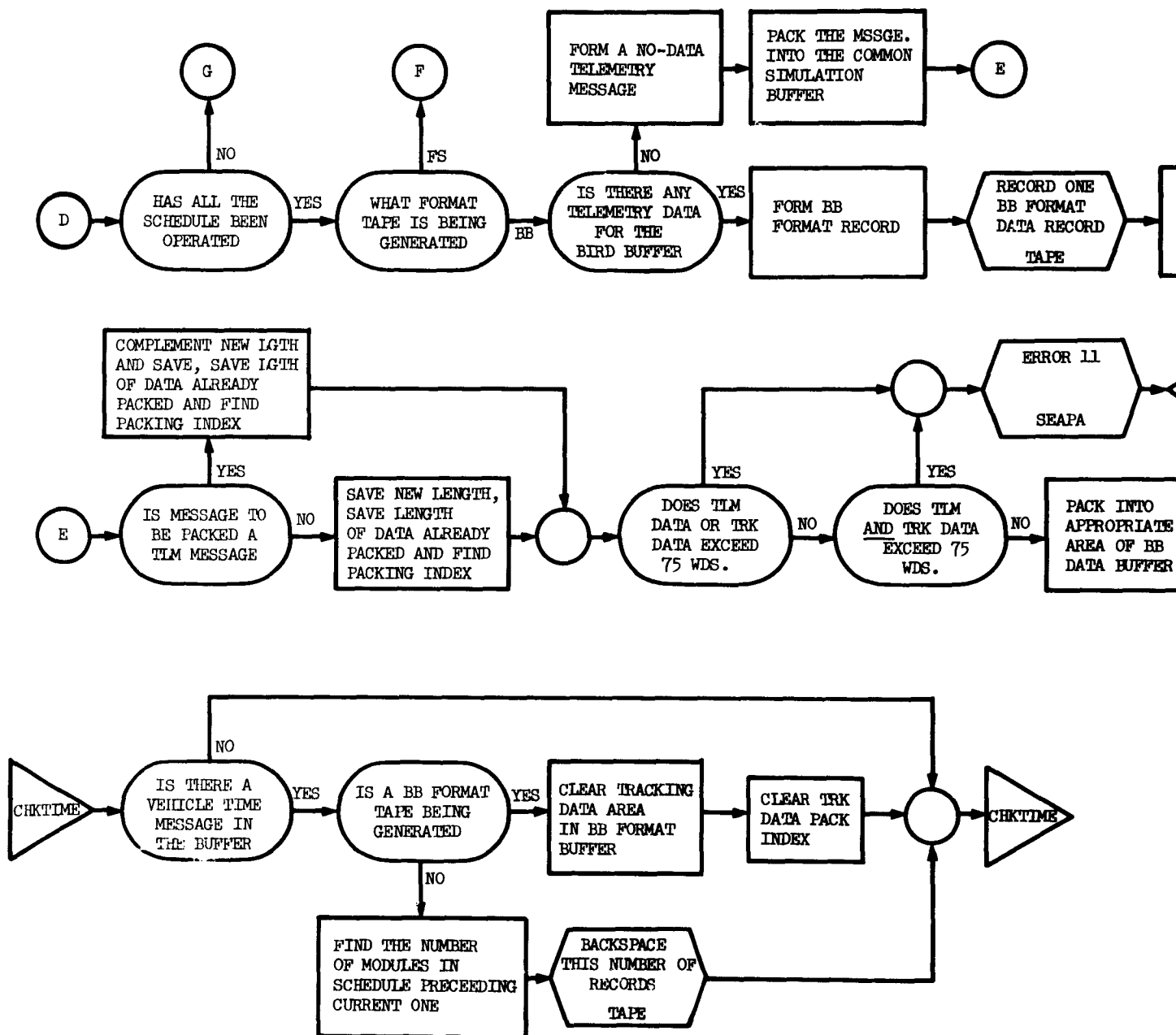




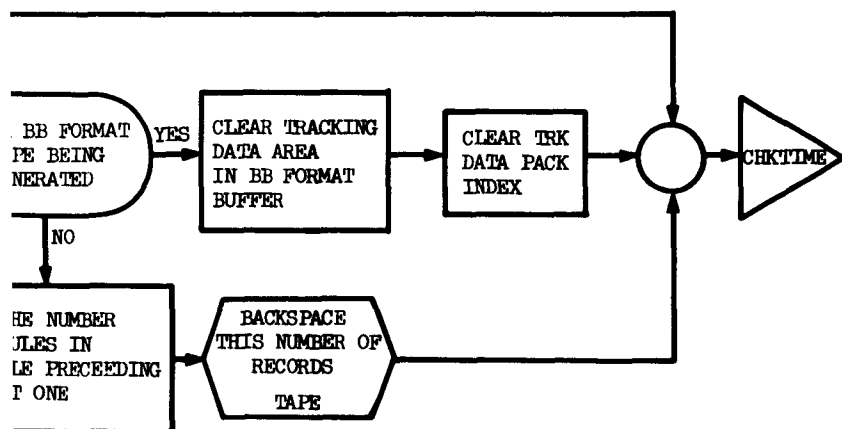
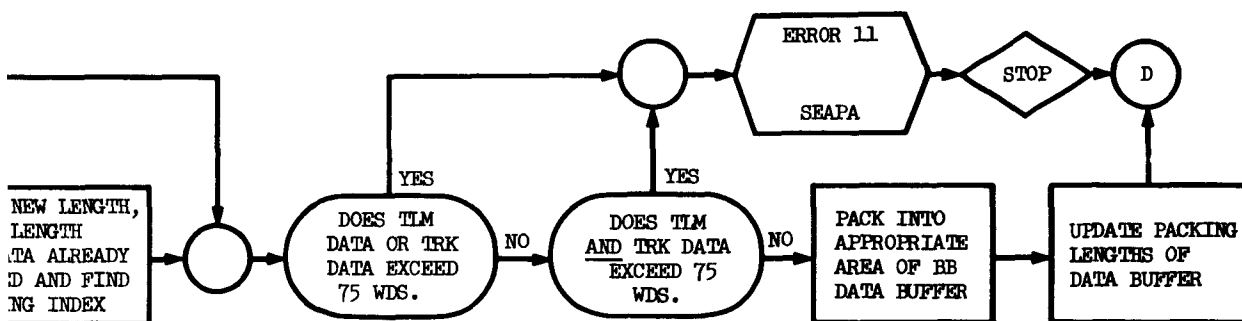
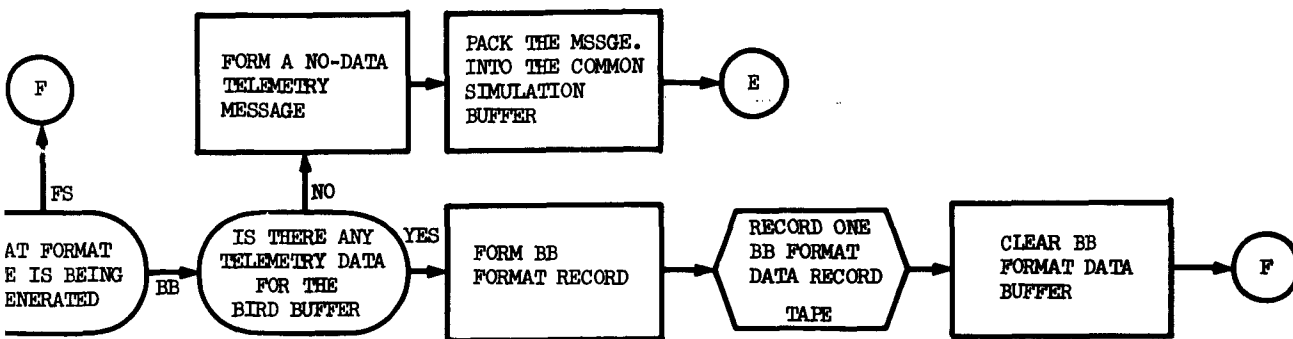
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System Development Corporation,
Santa Monica, California
1604 SIMULATION PROGRAM DESCRIPTIONS
MILESTONE 11 SIMULATED DATA GENERATION
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Scientific rept., TM(L)-734/026/00, by
G. A. Madrid. 15 March 1963, 10p.,
4 refs.
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Division, AFSC)

Unclassified report

DESCRIPTORS: Programming (Computers).
Satellite Networks.

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Reports that SDGC (Simulation Data
Generation Control Routine) is used
by the ordered execution of the data
generation subroutines pre-scheduled
by SIPSA, to update the system time
counters, and to pack outputs from the
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requested.

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