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TM-(L)-734/033/OOA

TECHNICAL MEMORANDUM

(TM Series)

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Operating Instructions for the
Augmented Tracking Station Simulation Program
(SIMSTN)

Milestone 7

by

The Simulation Section

28 March 1963

Approved

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SYSTEM

DEVELOPMENT

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~~NO OTS~~

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CURRENT MODIFICATION

<u>Modified Pages</u>	<u>Notes and Filing Instructions</u>
3	Replace with page dated 28 March 1963. = Changes and/or additions
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3.2 SIPSA Tape

See Milestone 4 for Simulation of the Augmented SCF Environment at the STA and CPDC, TM-(L)-734/015/00, and TM-(L)-734/015/00A, for complete description of the contents of this tape.

4.0 OUTPUTS

4.1 Tracking Station Message Outputs

A complete breakdown of the contents of these messages is provided in the Bird Buffer Combined Milestone 3 and 4, TM-(L)-834/000/01. Only the message titles, lengths, and numeric codes are used here to describe them.

<u>Message</u>	<u>Code</u>	<u>Length</u>	<u>When Sent</u>
HELLO	01	7	Initial Hellos are sent continuously by SIMSTN until bird buffer replies.
READY	02	5	Response to bird buffer Hello.
MISCONNECTION	03	5	Wrong station code in bird buffer message.
LAST MESSAGE NOT APPROPRIATE	04	5	Bird buffer message is not appropriate to present operation.
LAST MESSAGE RECEIVED O.K.	05	4	Receipt of good transmission.
LAST MESSAGE NO GOOD	06	4	Receipt of message with checksum error.
REAL TIME NEAR	10	9	After ready messages are received from bird buffer, if SLJ No. 2 is off.
TEXT MESSAGE	11	64	SIMSTN sends a text message at start of each pass immediately following the "Hello" messages, if SLJ No. 4 is off.
OPERATIONAL TLM MODE	12	4	Sent during prepass exchange of messages.
TELEMETRY REPORT	13	Variable	Once per second in real time.
TRACKING REPORT	14	Variable	Once per second or at rate determined by filter in real time.

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(Tracking Station Message Outputs cont'd)

<u>Message</u>	<u>Code</u>	<u>Length</u>	<u>When Sent</u>
VEHICLE TIME MESSAGE	15	8	Every N seconds in real time. N determined by makeup of SIPSA tape.
COMMAND MESSAGE	16	Variable	Frequency of command reports determined by makeup of SIPSA tape. Command messages from bird buffer are sent back for verification.
TIME MESSAGE	17	6	Sent in real time for each second that there is no track message or no TLM message.
FADE MESSAGE	20	4	Sent when SIMSTN reads type 3 record from SIPSA tape indicating end of pass.

4.2 Typewriter Outputs

4.2.1 SIPSA Tape Identification

TYPE "O"
RECORD

	CHAR	CHAR	CHAR	CHAR	CHAR	CHAR
0000	1	2	3	4	5	6

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The six 161 typewriter characters contained in a SIPSA type "O" record as shown above are printed in the lower case immediately following the read of this record. If this first record read is not a type "O", SIMSTN will print out, "1ST RECD NOT A TYPEO". This is an indication that either a valid SIPSA tape is not mounted on tape unit number 1 or the tape has not been rewound to the load point.

If, during the running of SIMSTN, the following typeout occurs, "NOT A TYPE 2 OR 3 RECD", SIMSTN has not been started correctly or there is an error in the makeup of the SIPSA tape. The typeout, "END OF PASS", indicates that all of the SIPSA data pertaining to a pass has been passed on to the Bird Buffer. "END OF TAPE" printout indicates that the last station pass contained on the SIPSA tape has been completed.

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4.2.2 Error Typeouts

CCC INPUT BUFFER OVERFLOW - SIMSTN is receiving excessive data from the Bird Buffer.

WRONG VEHICLE NO - A misconnection message has been received from the Bird Buffer which indicates that SIMSTN sent a message with the wrong vehicle number.

BB CAN'T SERVICE REQUEST - Either a misconnection message or a LAST MESSAGE NOT APPROPRIATE has been received from the Bird Buffer.

TAPES NOT ON - The tape unit to be read or written has not been turned on.

TAPE NOT READY - The tape unit is not ready for some reason other than not being turned on.

PARITY ERROR - A parity error was sensed when either reading or writing on a magnetic tape.

EOF READ - End of file was sensed after a read operation on magnetic tape.

EOT SENSED - The end of that portion of a magnetic tape which may be written on was sensed.

The program will halt after any one of these typeouts. "WRONG VEHICLE NO." or "BB CAN'T SERVICE REQUEST" indicates that either the makeup of the SIPSA tape was incorrect, SIMSTN was not initialized and started correctly, or there is a misunderstanding in the message etiquette with the Bird Buffer. The error conditions for magnetic tape must be corrected and SIMSTN started from the beginning.

4.3 DROPSA Tape Output

Every recognizable message received from the Bird Buffer is output on tape unit No. 2. One message, preceded by a 160A word containing message error conditions, constitutes a record. This error indicator word is:

BIT	11	4	3	2	1	0
	0-----0	d	c	b	a	

where,

- a = "1" indicates checksum error
- b = "1" indicates message code in error
- c = "1" indicates message length error
- d = "1" indicates telemetry message
- d = "0" indicates track message

5.0 FUNCTION CARD FORMAT

None, this program is executed from bi-octal paper tape on the 160-A.

6.0 OPTIONS

This program must operate both on computer No. 2 at the CPDC and on a Bird Buffer configuration at the STC. The only significant difference is in the usage of the typewriter.

- SLJ No. 1 must be on to typeout on the internal buffer at the CPDC.
- SLJ No. 1 must be off to typeout in the channel extension mode at the STC.
- SLJ No. 2 on - send no real time near messages and do not start real time mode.
- SLJ No. 2 off- send real time near messages and go into real time mode.
- SLJ No. 4 on - do not send text message.
- SLJ No. 4 off- send text message.

7.0 FUNCTION INTERFACES

7.1 SIPSA

SIMSTN reads the magnetic tape prepared by SIPSA, as referenced in Section 3.2.

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APPENDIX B

OPERATING SUMMARY FOR THE COMPUTER PROGRAM DEVELOPMENT CENTER

Magnetic Tapes

SIPSA tape on unit No. 1

DROPSA blank on unit No. 2

Program Load

SIMSTN paper tape loaded into bank "0" at location "0" in computer No. 2.

Selective Jump Options

SLJ No. 1 on for typeout on internal buffer.

SLJ No. 1 off for typeout in the channel extension mode.

SLJ No. 2 on - send no real time near messages and do not start real time mode.

SLJ No. 2 off- send real time near messages and go into real time mode.

SLJ No. 4 on - do not send text message.

SLJ No. 4 off- send text message.

SIMSTN Start

Start at location 0100 in bank 0. Program will type out six typewriter characters for tape identification obtained from type "0" record. It will loop waiting for interrupt 40 from CCC simulator.

Bird Buffer Start

The Bird Buffer program must be loaded in computer No. 3 and cycled to accept an interrupt 40 prior to the manual interrupt of CCCSIM in computer No. 1.

CCCSIM Start

The CCC simulator program must be loaded into computer No. 1, bank 0, location 0, and started at 0 with all bank settings equal to 0. It should loop at locations 0740 and 0741. A manual interrupt of this computer by simultaneously depressing any selective jump switch and any selective stop switch will cause CCCSIM to start the normal sequence of routing messages between computers No. 2 and No. 3.

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