



DECUS

PROGRAM LIBRARY

DECUS NO.	8-506
TITLE	LOAD AREAS
AUTHOR	J. Fraser
COMPANY	University of Liverpool Liverpool, England
DATE	November 29, 1971
SOURCE LANGUAGE	SUBSET MACRO-8, COMPATIBLE WITH PAL-D

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LOAD AREAS

DECUS Program Library Write-up

DECUS NO. 8-506

1. ABSTRACT.

LOAD AREAS IS A KEYBOARD-ORIENTED PROGRAM FOR PDP-8 FAMILY COMPUTERS, WHICH PRODUCES A LIST OF THE CORE AREAS WHICH A BINARY OR RIM-FORMAT PAPER TAPE WILL OCCUPY WHEN LOADED.

2. PRELIMINARY REQUIREMENTS.

2.1 EQUIPMENT.

BASIC PDP-8, -8/S, -8/I, OR -8/L COMPUTER AND TELETYPE.

3. LOADING AND CALLING PROCEDURES.

3.1 LOADING.

USING BINARY LOADER (PAPER TAPE OR DISK SYSTEM VERSION), LOAD THE PROGRAM INTO ANY FIELD. START THE PROGRAM AT ADDRESS 200 IN THE SAME FIELD.

3.2 SAVING.

TO SAVE THE PROGRAM IN THE DISK MONITOR SYSTEM, THE PROGRAM MUST BE LOADED INTO FIELD 0.

THE SAVE COMMAND IS :

SAVE LDAR:0-1177;202

TO CALL THE PROGRAM :

CALL LDAR

3.3 STARTING ADDRESS.

WHEN THE PROGRAM IS STARTED AT 200, PROGRAM IS MODIFIED TO HALT WHEN TERMINATED. IF PROGRAM IS ALWAYS STARTED/RESTARTED AT 202, THIS MODIFICATION IS SUPPRESSED, AND PROGRAM TERMINATES BY RE-ENTERING DISK MONITOR.

3.4 OTHER MONITOR SYSTEMS.

IN THE LOC.202-START MODE, THE PROGRAM EXITS TO 7600 IN ITS OWN FIELD. IF A MONITOR SYSTEM WITH A DIFFERENT ENTRY ADDRESS IS USED, THIS ADDRESS SHOULD BE DEPOSITED IN LOC.0241.

3.5 ASSEMBLY.

THE PROGRAM IS AVAILABLE AS A BINARY PAPER TAPE. HOWEVER, SHOULD IT BE REQUIRED TO RE-ASSEMBLE, THE FOLLOWING SHOULD BE NOTED : THE SOURCE TAPE IS SUPPLIED IN TWO PARTS; PART 1 IS TERMINATED BY A PAUSE STATEMENT; PART 2 CONTAINS TWO EMBEDDED PAUSE STATEMENTS, WHICH COULD ADVANTAGEOUSLY BE EDITED OUT; THE PROGRAM SHOULD BE ASSEMBLED WITH MACRO-8 OR PAL-D.

4. USING THE PROGRAM.

4.1 MODES OF OPERATION.

AT ANY TIME, THE PROGRAM MAY BE REGARDED AS RUNNING IN ONE OF TWO MODES: COMMAND MODE AND DATA MODE. THE PROGRAM ANNOUNCES THE PRESENCE OF COMMAND MODE BY TYPING *, AND OF DATA MODE BY TYPING #. IN COMMAND MODE, THE ACTION OF THE PROGRAM MAY BE CONTROLLED BY TYPING COMMANDS ON THE KEYBOARD. THE AVAILABLE COMMANDS ARE LISTED BELOW; EACH CONSISTS OF A SINGLE CHARACTER. RESPONSE TO THE COMMAND CHARACTER IS IMMEDIATE, SO THE USER SHOULD TYPE CAREFULLY.

4.2 RESTART PROCEDURE.

PROGRAM RETURNS TO COMMAND MODE AFTER EACH TAPE IS READ, THEREFORE RESTARTS SHOULD NOT NORMALLY BE NEEDED.

WHEN USING THE PROGRAM AS A STAND-ALONE ROUTINE, IT MAY BE RESTARTED FROM ADDRESS 200 OR 202. RESTART PROCEDURE IS NOT APPLICABLE WHEN THE PROGRAM IS USED IN DISK MONITOR SYSTEM; IT SHOULD BE CALLED DOWN AGAIN.

4.3 COMMANDS.

THE EFFECTS OF COMMAND CHARACTERS ARE AS FOLLOWS :-

COMMAND LETTER	EFFECT
H	READ TAPES FROM HIGH-SPEED READER.
L	READ TAPES FROM TELETYPE READER.
R	READ TAPES AS RIM FORMAT.
B	READ TAPES AS BINARY FORMAT.
T	ENTER TITLE MODE (SEE BELOW).
CTRL/P	PROCEED TO READ TAPE.
CTRL/C	TERMINATE PROGRAM. IF RUN UNDER DISK MONITOR, RETURN CONTROL TO MONITOR, ELSE HALT.
SHIFT/CTRL/P (LEADER/TRAILER)	IGNORED.
ANY OTHER	ERROR; TYPES ? AND AWAITS FURTHER COMMAND.

4.4 TITLES.

THE T-COMMAND MAY BE USED TO ANNOTATE OUTPUT; AFTER GIVING A T-COMMAND, SUCCEEDING CHARACTERS ARE SIMPLY ECHOED UNTIL CARRIAGE RETURN IS TYPED, THIS RESTORES COMMAND MODE.

4.5 INITIAL SETTINGS.

THE PROGRAM IS INITIALLY SET FOR BINARY FORMAT INPUT ON THE HIGH SPEED READER.

4.6 READING A TAPE.

PLACE TAPE IN SELECTED READER WITH LEADER CODE OVER THE READ STATION. TYPE CTRL/P. FOR H.S.R., NO FURTHER ACTION IS NECESSARY. FOR TELETYPE READER, READER SWITCH MUST BE TURNED TO START WITHIN TEN SECONDS.

IF TAPE JAMS, RELEASE IT FROM READER, REMOVE IT, WAIT FOR ERROR MESSAGE, THEN TRY AGAIN.

WHEN USING THE TELETYPE READER, READER SHOULD BE STOPPED BEFORE END OF TAPE, WHILE READER IS STILL ON TRAILER CODE.

4.7 PROGRAM OUTPUT.

OUTPUT IS PRODUCED ONLY FOR LOCATIONS WHICH ARE ACTUALLY LOADED INTO, E.G. THE BINARY FORM OF

*200;*0;7777

WILL NOT PRODUCE OUTPUT FOR LOC.200.

WHEN AN ISOLATED WORD WOULD BE LOADED, ITS ADDRESS IS TYPED ON A NEW LINE.

WHEN SEVERAL WORDS WOULD BE LOADED INTO CONSECUTIVE ADDRESSES, THE FIRST AND LAST ADDRESSES ARE TYPED ON A NEW LINE.

THE FORMAT OF AN ADDRESS IS FNNNN, WHERE NNNN IS THE OCTAL ADDRESS AND F IS THE FIELD SETTING. IF NO FIELD SETTING HAS BEEN READ SO FAR ON THE CURRENT TAPE, X IS TYPED INSTEAD OF A FIELD DIGIT.

THE OUTPUT IS STRICTLY IN THE ORDER OF READING FROM THE TAPE, E.G. THE BINARY OF

*2;0001;*1;7777

WILL PRODUCE OUTPUT

X0002

X0001

AND NOT

X0001 - X0002 .

AT THE END OF BINARY FORMAT TAPES, THE CHECKSUM IS VERIFIED, AND ANY ERROR IS REPORTED.

4.8 RESTRICTIONS.

THE PROGRAM TAPES WHICH ARE READ AS DATA ARE NOT LOADED BY THIS PROGRAM.

TAPES WHICH DEPEND ON OVERWRITING THEIR LOADER TO SELF-START, WILL NOT BE HANDLED CORRECTLY.

THE LOAD AREA PROGRAM CAN GIVE NO INDICATION OF OTHER CORE AREAS WHICH A PROGRAM MAY USE FOR BUFFERING OR SELF-RELOCATION.

4.9 USES OF THE PROGRAM.

SUBJECT TO THE ABOVE RESTRICTIONS, THE PROGRAM CAN BE USED TO DETERMINE FREE AREAS FOR LOADING PUNCH, DUMP, AND DEBUGGING ROUTINES, AND TO DISCOVER WHICH AREAS SHOULD TO BE DUMPED, PUNCHED, SEARCHED, ETC.

5. DETAILS OF OPERATION.

5.1 ERROR MESSAGES.

THE FOLLOWING ERROR MESSAGES MAY OCCUR :-

? ILLEGAL COMMAND (MAY ARISE IF TELETYPE READER IS NOT STOPPED BEFORE END OF TRAILER CODES).

OUT OF TAPE UNEXPECTEDLY READER WAS NOT LOADED/STARTED, OR TAPE FINISHED BEFORE TRAILER CODE WAS READ, OR ATTEMPT TO USE NON-EXISTENT H.S.R.

CHECKSUM ERROR NNNN BINARY TAPE CHECKSUM ERROR, OR RIM TAPE READ IN BINARY MODE. IF THE FORMER, NNNN IS (ACCUMULATED CHECKSUM)-(TAPE CHECKSUM), IN OCTAL

ALL ERRORS RETURN TO COMMAND MODE.

REVISION TO DECUS NO. 8-506 (LOAD AREAS)

J.D. Piguet, Institute of Hygiene, Geneva, Switzerland

A few mistakes in the present version of this program prevent it to operate correctly.

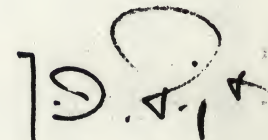
- A. Location 1044 should contain 7710 (- SPA CLA) instead of 7640 (-SZA CLA) in order to skip the next instruction when the program is in binary mode.
- B. The subroutine TIMEDV contains 4 errors in the binary tape. Locations 0407, 0411, 0415 and 0417 should contain the instructions specified in the listing (page 15) instead of DCA 0; DCA 0; ISZ 0; ISZ 0.
- C. The listing contains a mistake not found in the binary tape:
0263 5667 JMP I T /(not 7667)

- - - - -

If the enclosed patch is used, the program operates as stated by the original author.

Two sets of five examples are enclosed. The first set was obtained using the original binary tape; the second one was obtained using the same program, corrected by the proposed patch. To simulate a checksum error, a pencil was inserted between the light source and the paper tape in the high speed reader during execution.

Geneva, July 2nd, 1973.



J.D. Piguet

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PH.D. THESIS

BY

THE AUTHOR

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THE UNIVERSITY OF CHICAGO PRESS

Patch to DECUS No. 8-506 (LOAD AREAS)

This patch was obtained using ODT HIGH (DEC-08-COC2-PB)

Commands are underlined.

407/3000 3232

411/3000 3224

415/2000 2224

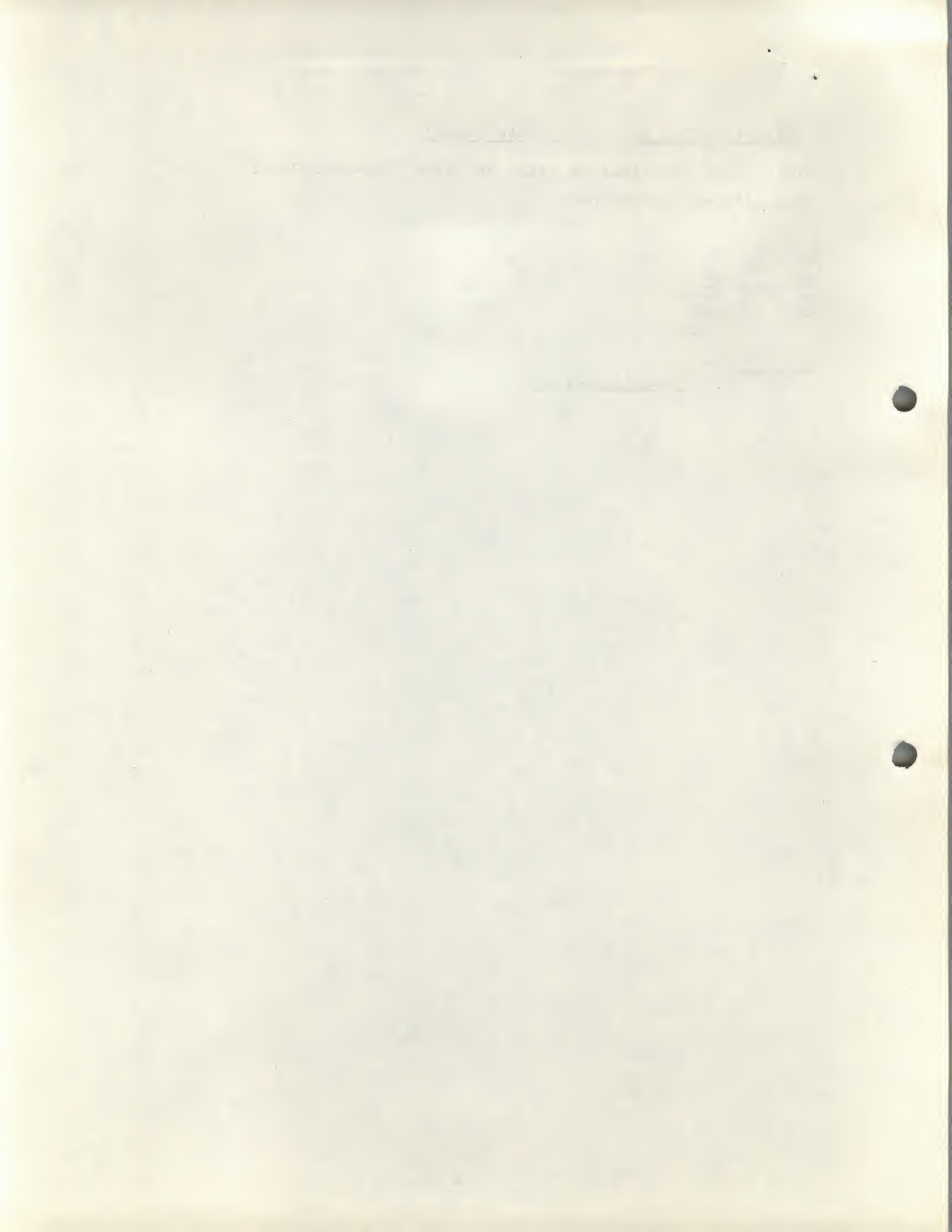
417/2000 2232

1044/7640 7710

T

407:417PB<**

1044:1044PH\$?E8



LOAD AREA PROGRAM

*T#

USING PATCH (J.D. PIGUET, GENEVA, SWITZERLAND: JULY 2, 1973)

*T#

DECUS 8-506 (LOAD AREAS)

*B

*H

*#

X0020 - X0030

X0200 - X0371

X0600 - X1143

X0031 - X0042

X0400 - X0562

X7143 - X7144

X0043

X0563 - X0576

CHECKSUM OK

*T#

DECUS 8-506 (SIMULATED CHECKSUM ERROR)

*B

*H

*#

X0020 - X0030

X0000 - X0171

X0400 - X0743

X0030 - X0041

X0400 - X0562

X7040 - X7041

X0040

X0460 - X0473

CHECKSUM ERROR 5340

*T#

DEC-08-LBAA-PM (BINARY LOADER)

*P

*H

*#

X7612 - X7755

X7777

*T#

DEC-08-LBAA-PM

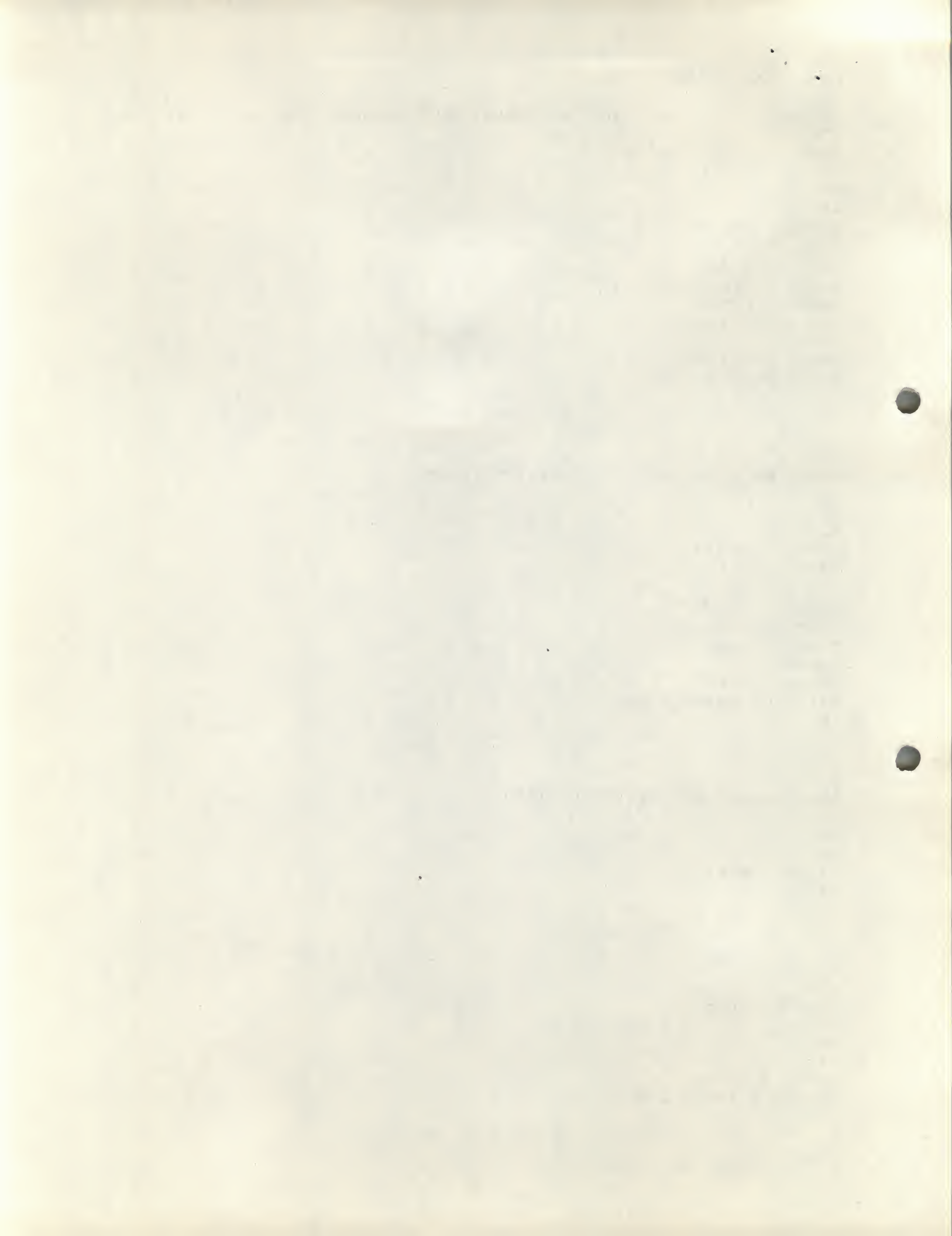
*B

*H

*#

X7612 - X7755

CHECKSUM ERROR 3621



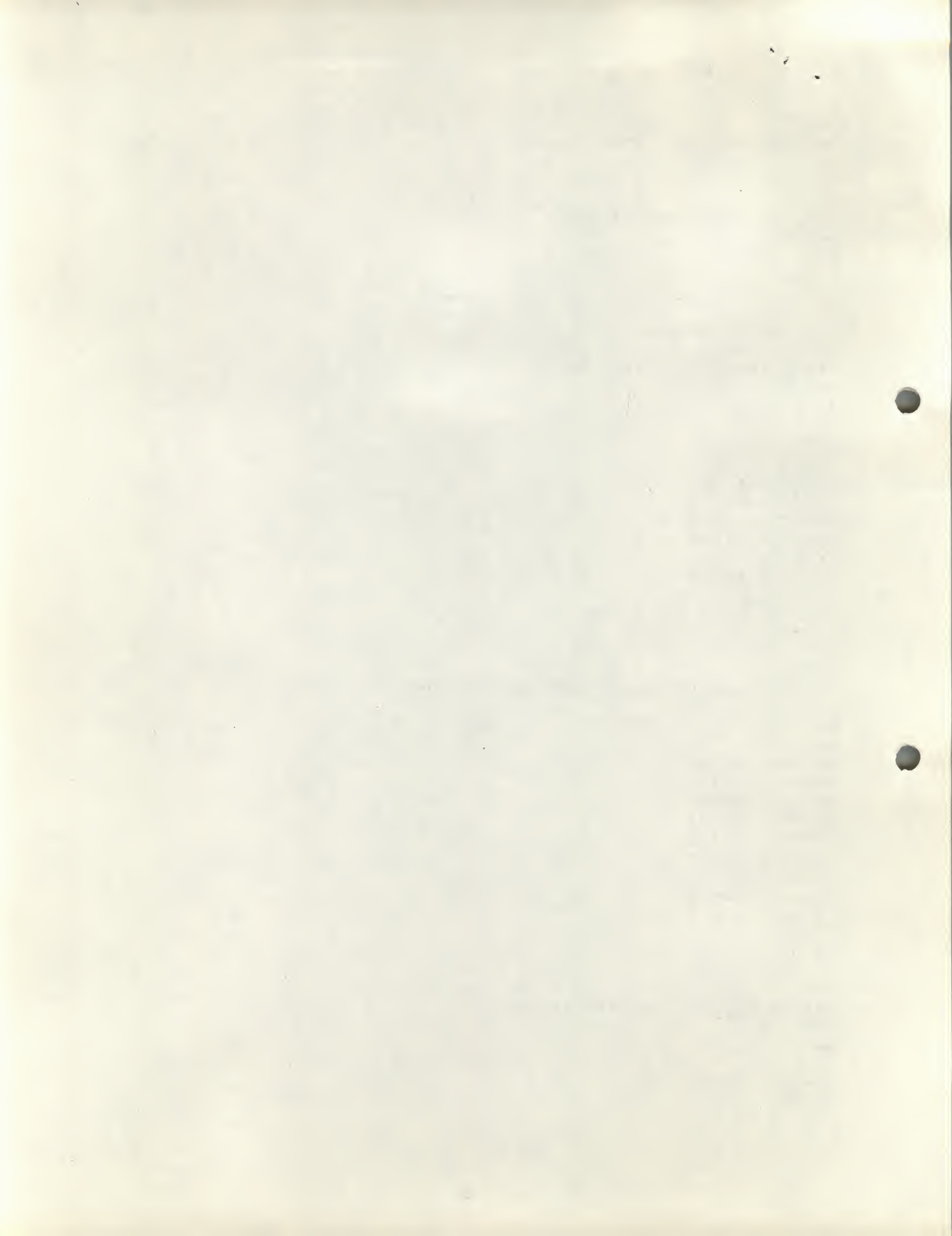
*T#
NO TAPE IN HIGH SPEED READER
*B
*H
*#
OUT OF TAPE UNEXPECTEDLY !
*

LOAD AREA PROGRAM

*T#
DECUS 8-506 (LOAD AREAS)
*B
*H
*#
X0020 - X0030
X0200 - X0371
X0600 - X1143
X0031 - X0042
X0400 - X0562
X7143 - X7144
X0043
X0563 - X0576

*T#
DECUS 8-506 (SIMULATED CHECKSUM ERROR)
*B
*H
*#
X0020 - X0030
X0000 - X0171
X0000 - X0343
X0030 - X0041
X0000 - X0162
X7040 - X7041
X0040
X0060 - X0073

*T#
DEC-08-LBAA-PM (BINARY LOADER)
*R
*H
*#
X7612 - X7755
X7777



*T#
DEC-08-LBAA-PM
*B
*H
*#
X7612 - X7755

*T#
NO TAPE IN HIGH SPEED READER
*B
*H
*#

