



# DECUS

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| DECUS NO.       | 8-641                                       |
| TITLE           | OS/8 FORMAT                                 |
| AUTHOR          | John E. Curtis                              |
| COMPANY         | Curtis Institute<br>East Moriches, New York |
| DATE            | May 21, 1973                                |
| SOURCE LANGUAGE | PAL-8                                       |

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DECUS



PROGRAM MANUAL

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| 1  |   |   |   |   |   |   |
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## OS/8 FORMAT

DECUS Program Library Write-up

DECUS NO. 8-641

### 1. Description:

=====

FORMAT is supplied as a PAL-8 source tape for easy modification to conform to the user's system. It is written for a system with no line printer and uses the device name LPT and device code 4. Designed for Model 33 and 38 Teletypes\* with 8 1/2 friction feed options, it can be modified for other terminals. Its tables are set for PAL-8 listings and general PIP dumps of ASC II files.

FORMAT offers the following controls:

1. Individually set tabulation positions.
2. Pagination of output. A switch register option permits inserting a halt between pages for paper changes, etc.
3. Right margin limit to suppress pile-up and Model 38 automatic carriage returns.
4. Left margin control as a switch register option.
5. Vertical tabulation, a set number of lines advance.
6. Model 38 ribbon change commands do not alter tabulation.

### 2. Pagination:

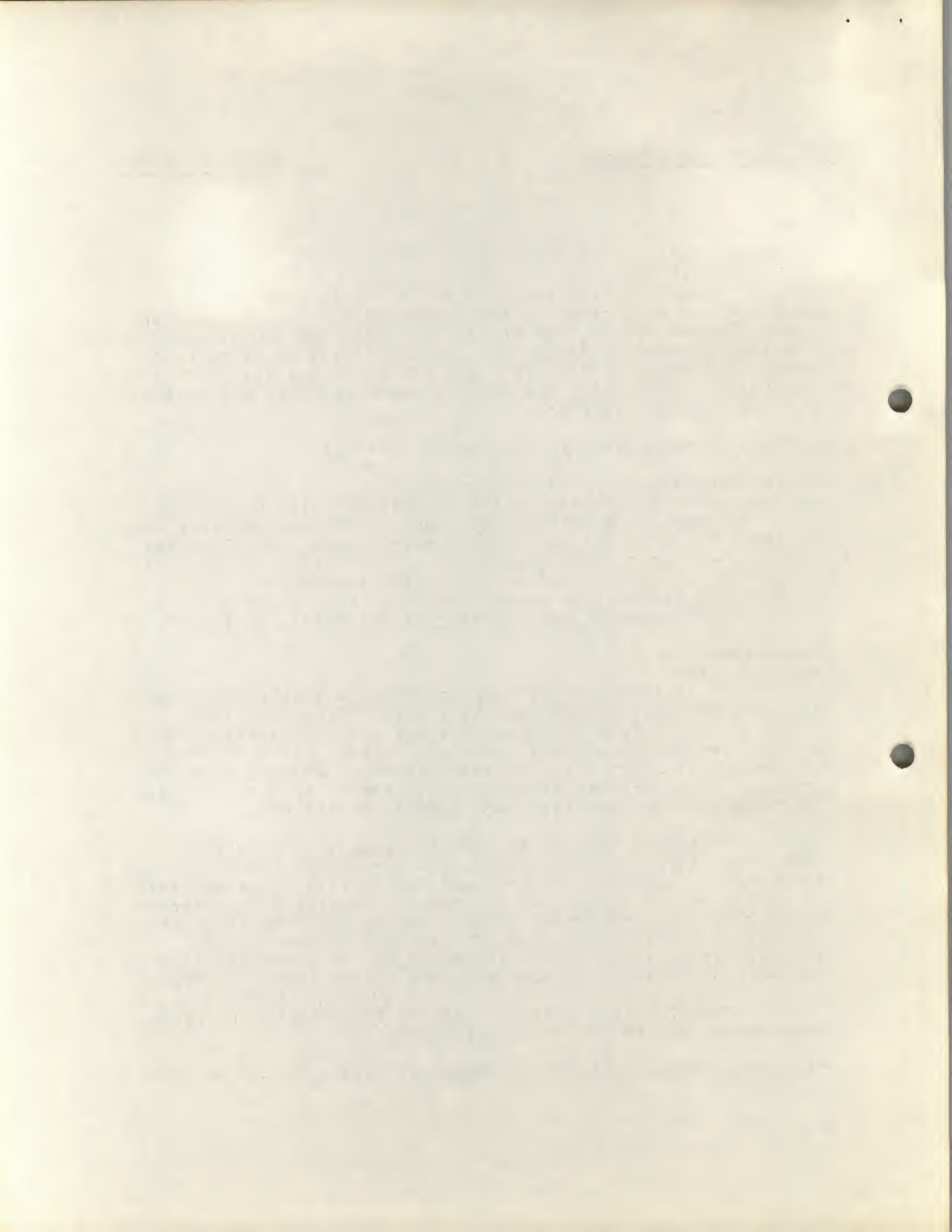
=====

On receipt of a 214 code or after a specified number of lines of text, FORMAT outputs a page. With SWR(0)=1, a set number of line feeds are output, a cut-line dash, and another set number of line feeds are output. If SWR(0)=0, a console halt occurs for a paper change. Pressing continue causes only a carriage return at the head of the next page. (No head or tail line feeds are output in this case.)

Following pagination, FORMAT ignores line feeds, carriage returns, vertical tabs, and form feeds until the next spacing character is received. This feature is designed to over-ride the pagination of programs supplying line feeds. The handler was originally written to overcome conflicts in pagination between PAL-8 and CREF under OS-8 Version 1. The pagination algorithm is disrupted by cut lines output by the calling program. (PAL-8 does not output these to LPT.)

FORMAT will correctly list and paginate ASC II files when called by PIP in I mode transfers.

\*Teletype is a registered trademark of Teletype Corporation.



FORMAT is preset for 5 line feeds at the head of the page, 57 lines of text, and 5 lines at the foot. The 57 lines of text are required for proper output of the PAL-8 symbol table. The head and foot are set for a page that can be trimmed to 11 1/2 inches.

### 3. Right Margin:

=====

When L characters are desired in a line, -L is loaded in TABSET and L in MTABST, locations 30 and 31 of page 2 of the handler. All characters after the Lth are discarded. MTABST is used for testing for the first printed character on the page. FORMAT is preset for 71 characters per line to suppress the automatic carriage return on the Model 38. This gives about a 5/8th inch minimum margin.

### 4. Left Margin:

=====

If SWR(11) is set to zero, the normal left margin is retained. If it is set to 1, the left margin is indented to the first tab position. FORMAT has the first tab set for column 4 to produce a 1 1/8 inch left margin using SWR(11)=1. (Note that when SWR(11)=1, the contents of TAB1 are copied into MTABST to control the pagination. Thus, if SWR(11) is set to 1 and then returned to zero, the pagination routine will not operate predictably.

### 5. Horizontal Tabulation:

=====

Horizontal tabulation is table driven. The table contains 20 entries but the last must be zero to terminate the table. For a tab position at column C, L-C is inserted in the table. Format is preset for a first tab at column 4 for margin control and additional positions at 8 column intervals.

### 6. Vertical Tabulation:

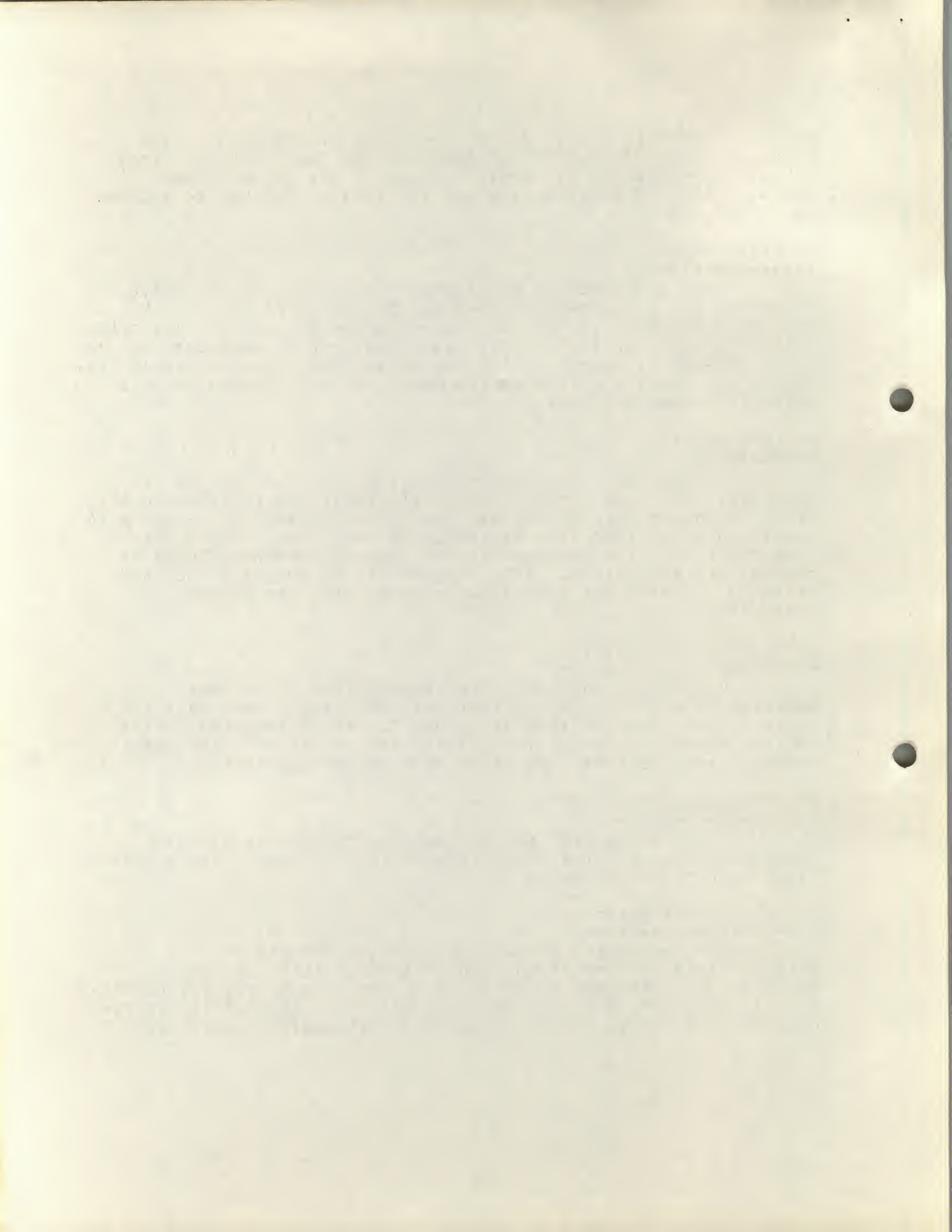
=====

The 213 code is interpreted as a request to output a specific number of line feeds (no carriage return). The number number preset at VERTAB is 3.

### 7. Table Modification:

=====

Entries in the format table can be changed at assembly time, at insertion using the BUILD ALTER command, between runs using ODT or EPIC, or at run time by setting SWR(0)=0. In the last case, the computer will halt when the handler is first called. The tables are at the start of the page in which the



halt occurs. If the computer is set to local address 140, three locations before the halt, and continue pressed, the switch register will be rechecked, and if desired, a cut line and head space output.

No details on using ODT or EPIC are included as some installation directors may forbid altering code in the system head area.

#### 8. Compressing PAL-8 Listings:

=====

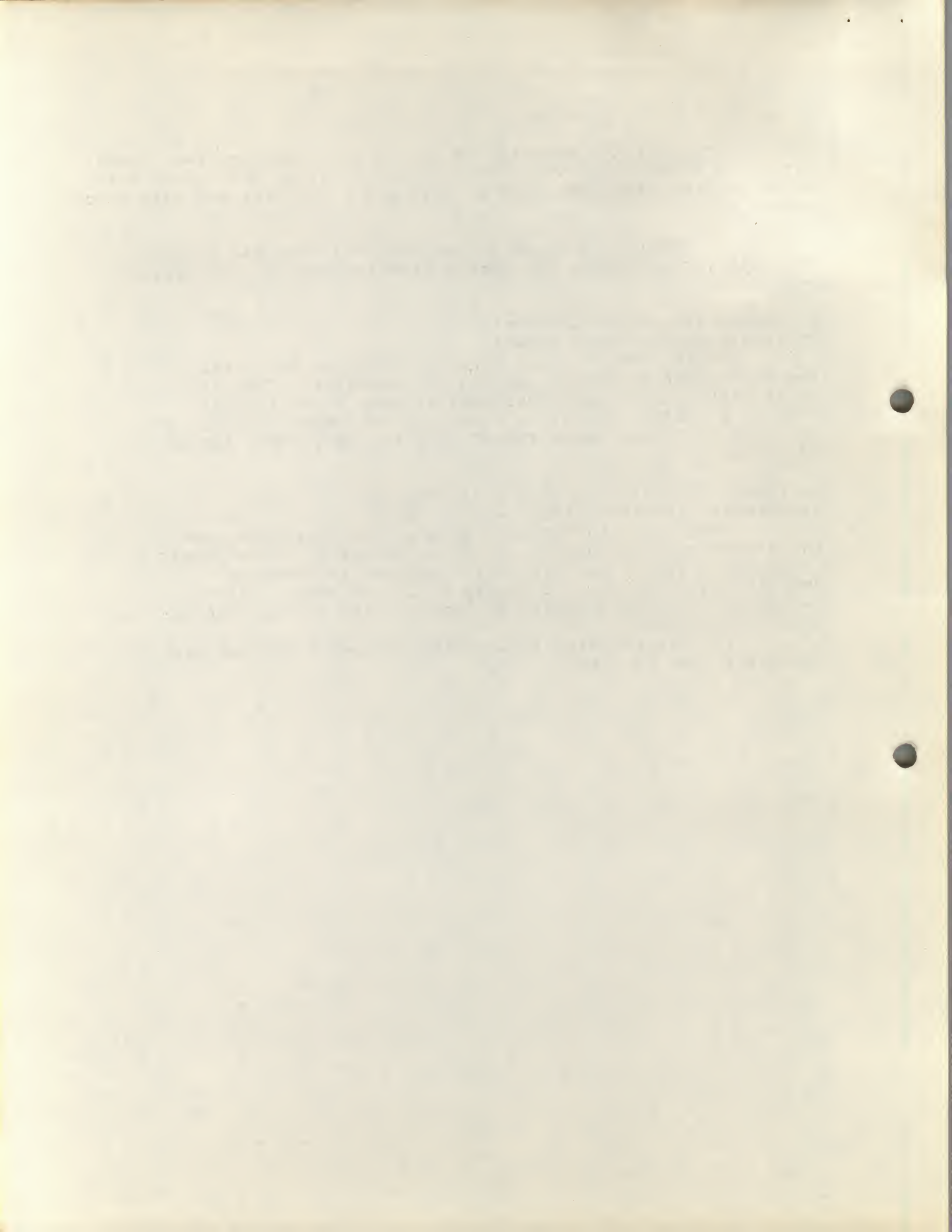
PAL-8 listing files can be reduced by 30 to 40% if the conversion of tabs to spaces is suppressed. This can be accomplished by patching location 1366 to be 1136 and 2422 to be 7000. Output is acceptable to CREF. The output can then be listed using FORMAT with the tabulation tables adjusted.

#### 9. FORMAT on Systems with a Line Printer:

=====

When using FORMAT on a system with a line printer, the device name and number should be changed. Since FORMAT is not file structured the entry need not be changed. The listing shows how the change should be made. The x's represent the user's choice of name and the n's his choice of device number.

The listing also shows a minimal patch for use with form-feed type terminals.





DECUS 8-641  
OS/8 FORMAT

Erratum

The listing and source tape for DECUS 8-641 OS/8 FORMAT contain an error in the tabulation table. The fifth tabulation position at location 404 should be 43. It may be corrected before assembly using EDIT or at load time using BUILD.

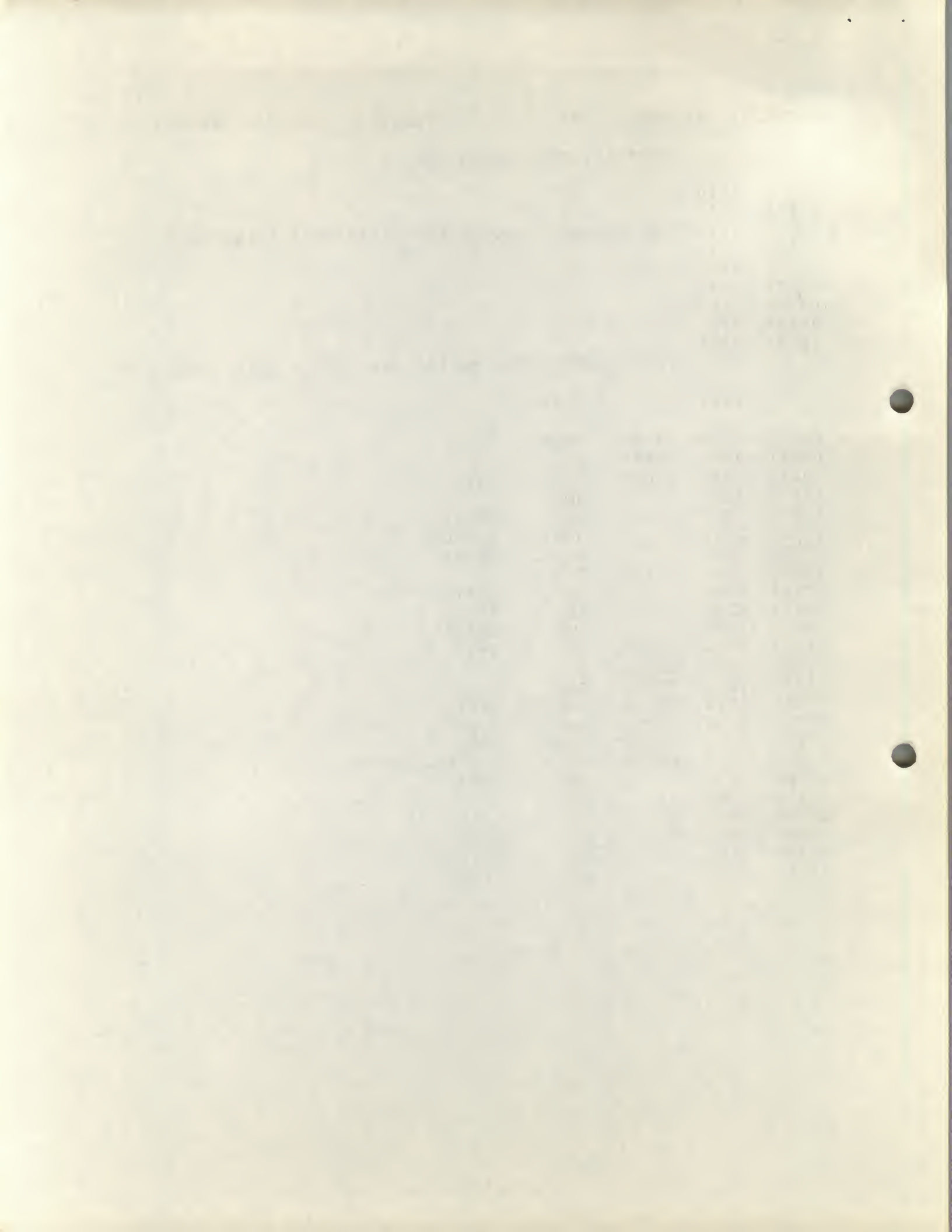


/FORMAT, TTY REPLC. LPT

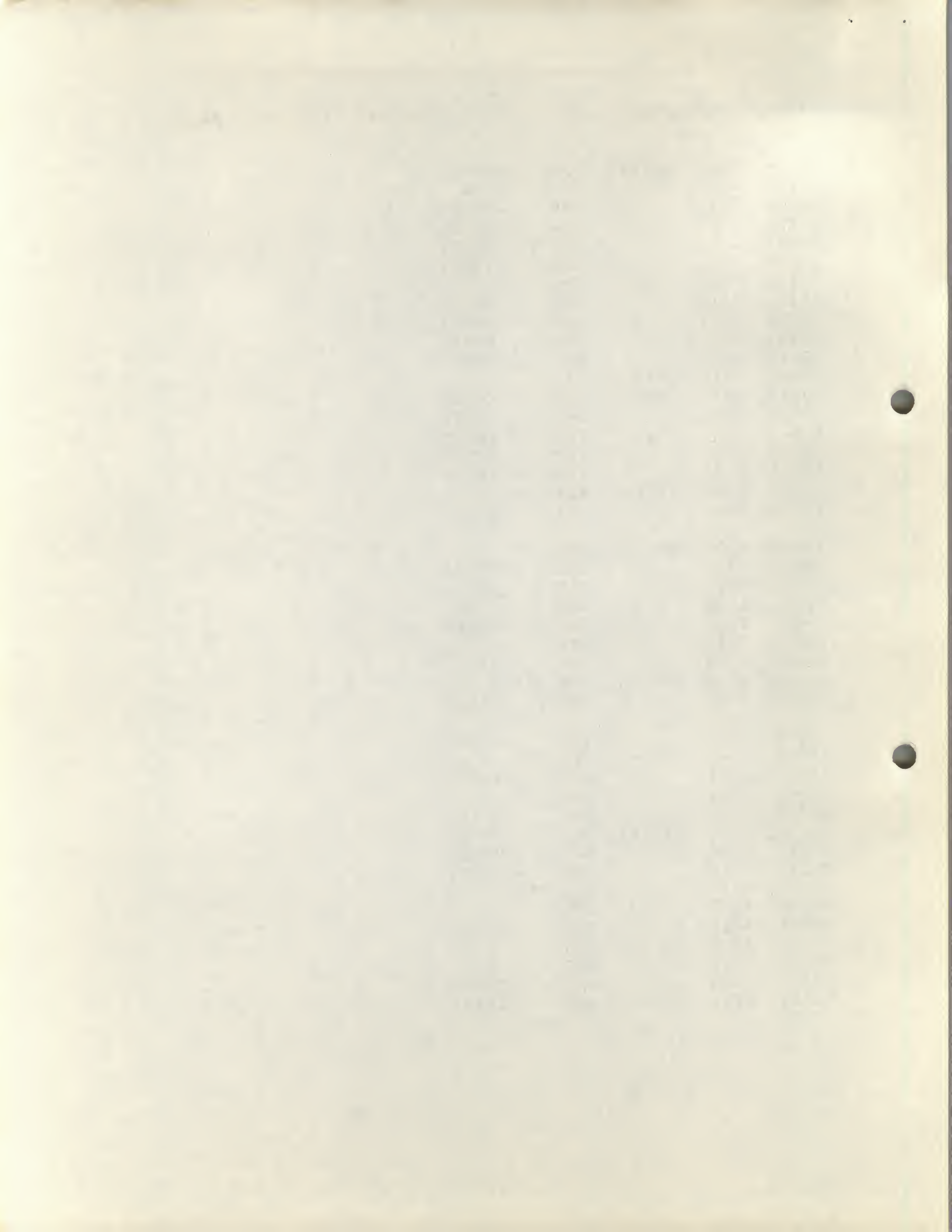
|       |      |   |
|-------|------|---|
| 00000 | 0000 | *0  |
| 00000 | 7777 | -1  |
| 00001 | 1424 | DEVICE LTTY; DEVICE LPT; 1040; 4001; ZBLOCK 2 |
| 00002 | 2431 |   |
| 00003 | 1420 |   |
| 00004 | 2400 |   |
| 00005 | 1040 |   |
| 00006 | 4001 |   |
| 00007 | 0000 |   |

/or DEVICE LTTY; DEVICE xxx; Inn0; 4001; ZBLOCK 2

|       |      |         |                 |
|-------|------|---------|-----------------|
| 00200 | 0200 | *200    |                 |
| 00200 | 7400 | P7400,  | 7400            |
| 00201 | 0000 | ENTRY,  | 0               |
| 00202 | 7600 | P7600,  | 7600 /CLA       |
| 00203 | 6214 |         | RDF             |
| 00204 | 1262 |         | TAD PCDIF       |
| 00205 | 3251 |         | DCA XITFLD      |
| 00206 | 1601 |         | TAD I ENTRY     |
| 00207 | 7700 | P7700,  | SMA CLA         |
| 00210 | 5246 |         | JMP EXIT        |
| 00211 | 2303 |         | ISZ TYPE1       |
| 00212 | 5230 |         | JMP NOINIT      |
| 00213 | 4214 | COUNT,  | JMS .+1         |
| 00214 | 0000 | ADDR,   | 0               |
| 00215 | 1214 | CORE,   | TAD .-1         |
| 00216 | 1313 | HOLD1,  | TAD TYPE2       |
| 00217 | 3214 | CHAR,   | DCA ADDR        |
| 00220 | 1214 | TABCNT, | TAD ADDR        |
| 00221 | 1377 | ADDR2,  | TAD (TRETN-INIT |
| 00222 | 4614 |         | JMS I ADDR      |
| 00223 | 7325 |         | STP3            |
| 00224 | 1214 |         | TAD ADDR        |
| 00225 | 3214 |         | DCA ADDR        |
| 00226 | 1243 |         | TAD DFIELD      |
| 00227 | 4313 |         | JMS TYPE2       |

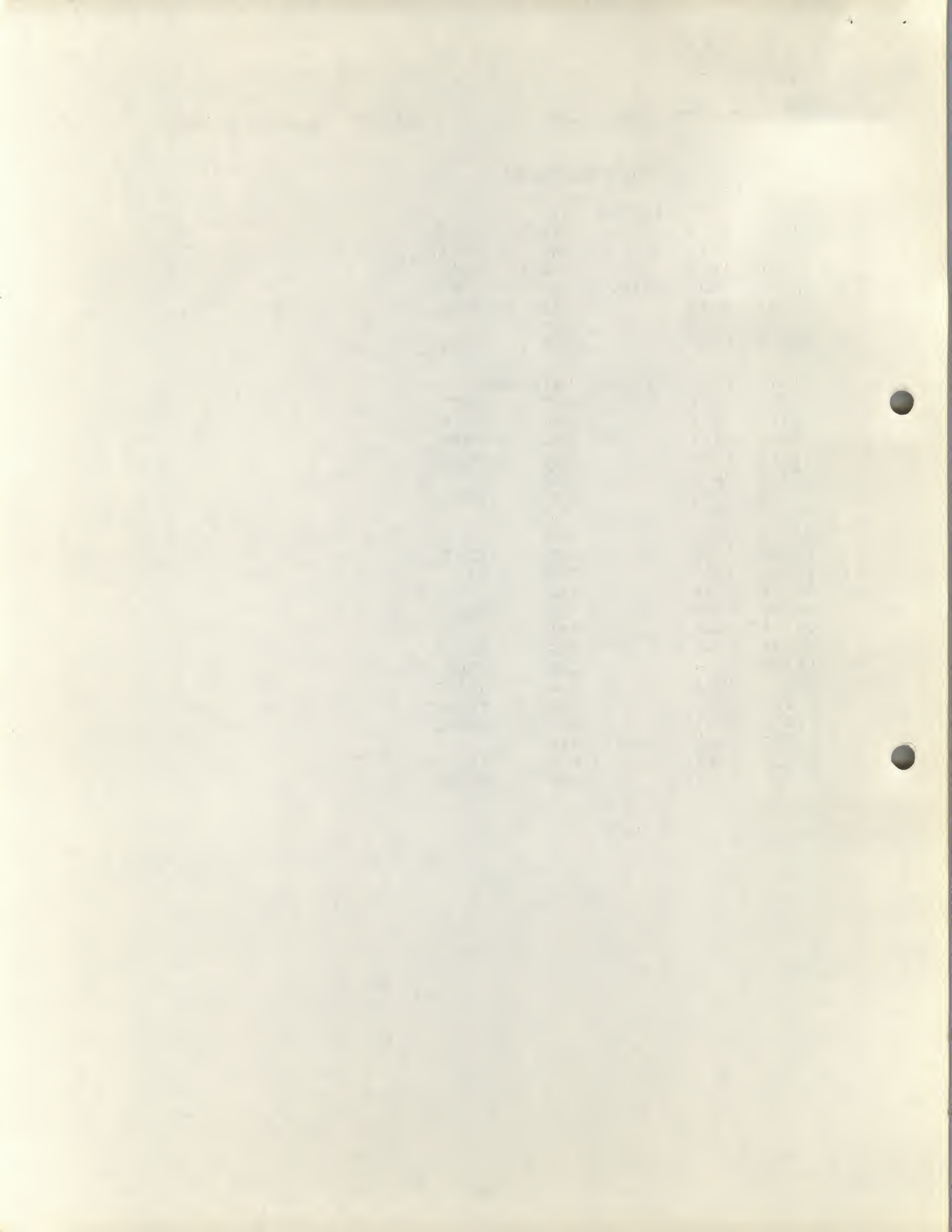


|       |      |         |         |        |
|-------|------|---------|---------|--------|
| 00230 | 1601 | NOINIT, | TAD I   | ENTRY  |
| 00231 | 0376 |         | AND     | (70    |
| 00232 | 1375 |         | TAD     | (CDF   |
| 00233 | 3243 |         | DCA     | DFIELD |
| 00234 | 1601 |         | TAD I   | ENTRY  |
| 00235 | 0374 |         | AND     | (3700  |
| 00236 | 7040 |         | CMA     |        |
| 00237 | 3213 |         | DCA     | COUNT  |
| 00240 | 2201 |         | ISZ     | ENTRY  |
| 00241 | 1601 |         | TAD I   | ENTRY  |
| 00242 | 3215 |         | DCA     | CORE   |
| 00243 | 0214 | DFIELD, | 214     |        |
| 00244 | 2213 | CNTIT,  | ISZ     | COUNT  |
| 00245 | 5253 |         | JMP     | WRITE  |
| 00246 | 2201 | EXIT,   | ISZ     | ENTRY  |
| 00247 | 2201 |         | ISZ     | ENTRY  |
| 00250 | 2201 |         | ISZ     | ENTRY  |
| 00251 | 7402 | XITFLD, | HLT     |        |
| 00252 | 5601 |         | JMP I   | ENTRY  |
|       |      |         |         |        |
| 00253 | 6031 | WRITE,  | KSF     |        |
| 00254 | 5271 |         | JMP     | WRITE2 |
| 00255 | 1307 |         | TAD     | P200   |
| 00256 | 6034 |         | KRS     |        |
| 00257 | 1373 |         | TAD     | (-203  |
| 00260 | 7440 |         | SZA     |        |
| 00261 | 5264 |         | JMP     | +.3    |
| 00262 | 6203 | PCDIF,  | CDF CIF | 0      |
| 00263 | 5602 |         | JMP I   | P7600  |
|       |      |         |         |        |
| 00264 | 1372 |         | TAD     | (-14   |
| 00265 | 7640 |         | SZA CLA |        |
| 00266 | 5271 |         | JMP     | +.3    |
| 00267 | 6032 |         | KCC     |        |
| 00270 | 5246 |         | JMP     | EXIT   |
| 00271 | 4303 | WRITE2, | JMS     | TYPE1  |
| 00272 | 3216 |         | DCA     | HOLD1  |
| 00273 | 4303 |         | JMS     | TYPE1  |
| 00274 | 7112 |         | CLL RTR |        |
| 00275 | 7012 |         | RTR     |        |
| 00276 | 1216 |         | TAD     | HOLD1  |
| 00277 | 7012 |         | RTR     |        |
| 00300 | 7012 |         | RTR     |        |
| 00301 | 4313 |         | JMS     | TYPE2  |
| 00302 | 5244 |         | JMP     | CNTIT  |



## /TYPE ROUTINES

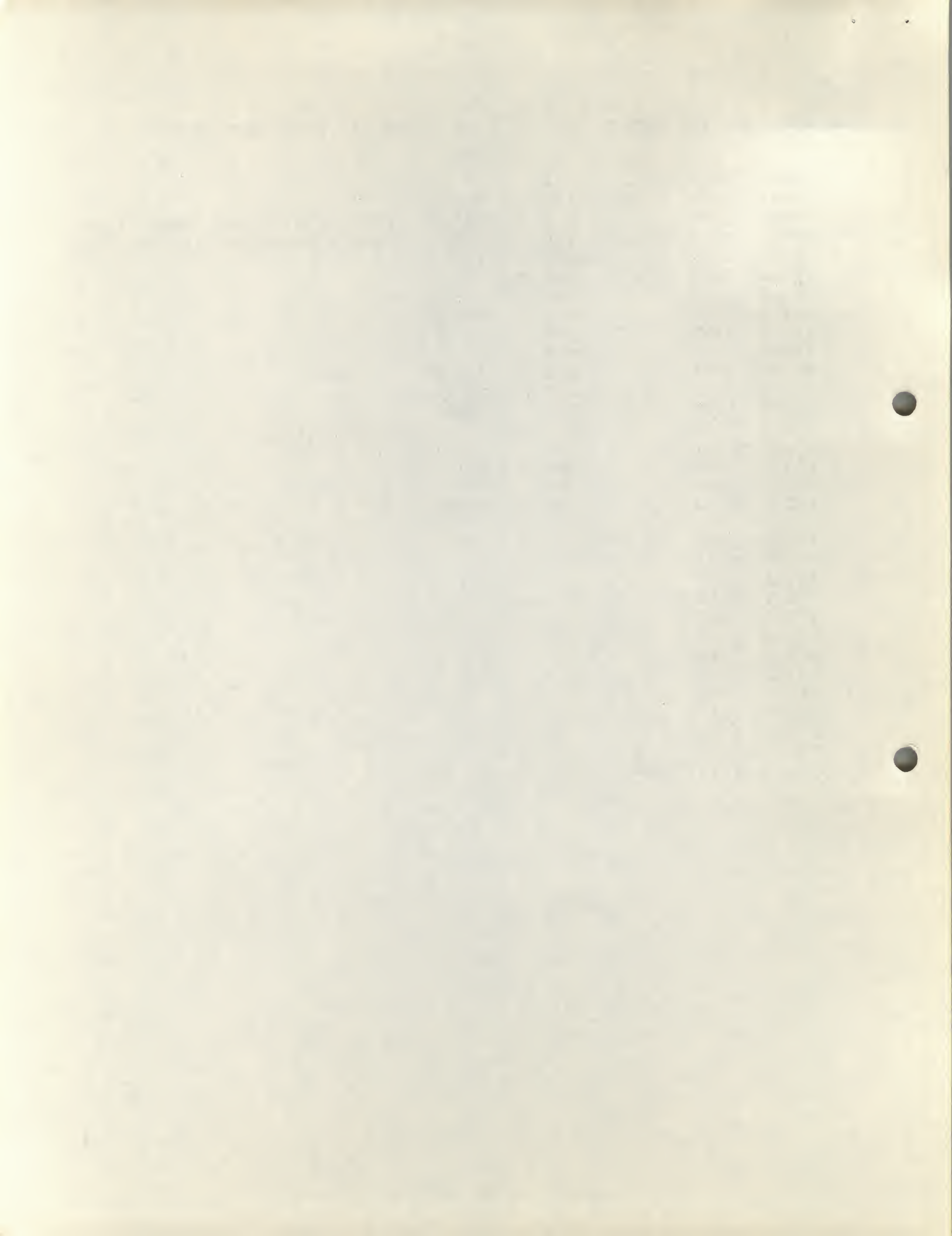
|       |      |        |           |        |
|-------|------|--------|-----------|--------|
| 00303 | 7777 | TYPE1, | -1        |        |
| 00304 | 1615 |        | TAD I     | CORE   |
| 00305 | 4313 |        | JMS       | TYPE2  |
| 00306 | 1615 |        | TAD I     | CORE   |
| 00307 | 0200 | P200,  | AND       | P7400  |
| 00310 | 2215 |        | ISZ       | CORE   |
| 00311 | 7000 |        | NOP       |        |
| 00312 | 5703 |        | JMP I     | TYPE1  |
| 00313 | 0351 | TYPE2, | INIT-ADDR |        |
| 00314 | 0371 |        | AND       | (377   |
| 00315 | 3217 |        | DCA       | CHAR   |
| 00316 | 1217 |        | TAD       | CHAR   |
| 00317 | 1370 |        | TAD       | (-233  |
| 00320 | 7450 |        | SNA       |        |
| 00321 | 5341 |        | JMP       | ESC    |
| 00322 | 7001 |        | IAC       |        |
| 00323 | 7450 |        | SNA       |        |
| 00324 | 5246 |        | JMP       | EXIT   |
| 00325 | 1367 |        | TAD       | (14    |
| 00326 | 7100 |        | CLL       |        |
| 00327 | 1366 |        | TAD       | (5     |
| 00330 | 7420 |        | SNL       |        |
| 00331 | 5344 |        | JMP       | REG    |
| 00332 | 1214 |        | TAD       | ADDR   |
| 00333 | 3221 |        | DCA       | ADDR2  |
| 00334 | 1220 |        | TAD       | TABCNT |
| 00335 | 5621 |        | JMP I     | ADDR2  |
| 00336 | 7440 | TRETN, | SZA       |        |
| 00337 | 3220 |        | DCA       | TABCNT |
| 00340 | 5713 |        | JMP I     | TYPE2  |





```
00341 7240 ESC, STA
00342 1220 TAD TABCNT
00343 3220 DCA TABCNT /SUPPRESS TAB OF RIBBON CHNG
00344 1365 REG, TAD (212 /DON'T INCREMENT TAB FOR RO
00345 0364 AND (140
00346 7650 SNA CLA
00347 5355 JMP .+6
00350 2220 ISZ TABCNT
00351 5355 JMP .+4
00352 7240 STA
00353 3220 DCA TABCNT
00354 5713 JMP I TYPE2
00355 1217 TAD CHAR
00356 6046 TLS
00357 6041 TSF
00360 5357 JMP .-1
00361 7200 CLA
00362 5713 JMP I TYPE2

00364 0140
00365 0212
00366 0005
00367 0014
00370 7545
00371 0377
00372 7764
00373 7575
00374 3700
00375 6201
00376 0070
00377 7551
0400 PAGE
```

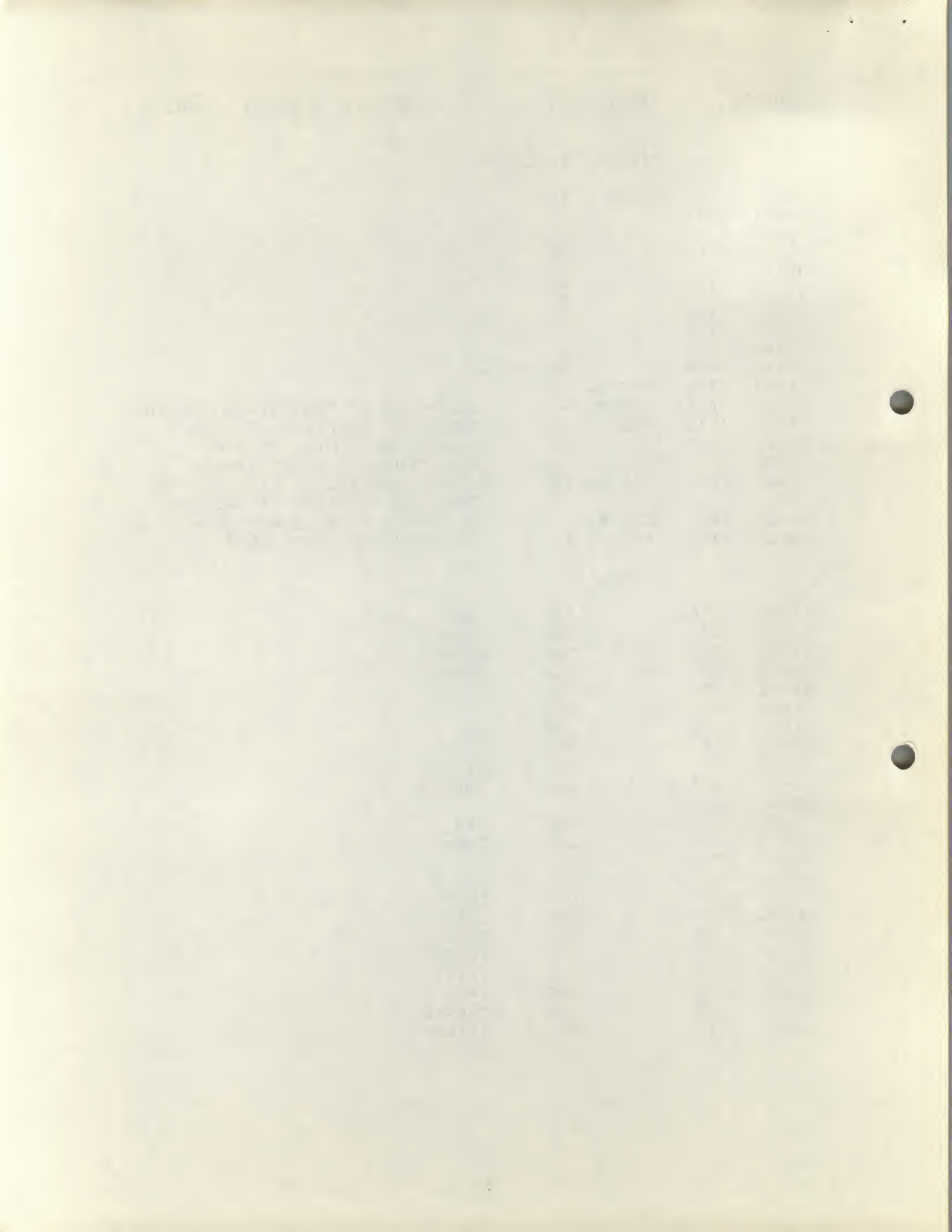


## /FORMAT TABLES

|       |      |         |        |                                  |
|-------|------|---------|--------|----------------------------------|
| 00400 | 0103 | TAB1,   | 103    |                                  |
| 00401 | 0073 |         | 73     |                                  |
| 00402 | 0063 |         | 63     |                                  |
| 00403 | 0053 |         | 53     |                                  |
| 00404 | 0003 |         | 3      |                                  |
| 00405 | 0033 |         | 33     |                                  |
| 00406 | 0023 |         | 23     |                                  |
| 00407 | 0013 |         | 13     |                                  |
| 00410 | 0000 |         | 0      |                                  |
| 00411 | 0000 |         | ZBLOCK | 13                               |
| 00424 | 7775 | VERTAB, | -3     |                                  |
| 00425 | 7707 | LINSET, | -71    | /NEGATIVE OF TEXT LINES PER PAGE |
| 00426 | 7773 | HEAD,   | -5     | /NEGATIVE OF LINES AT HEAD       |
| 00427 | 7773 | TAIL,   | -5     | /NEGATIVE OF LINE AT FOOT        |
| 00430 | 7671 | TABSET, | -107   | /POSITIONS TO RIGHT MARGIN       |
| 00431 | 0107 | MTABST, | 107    | /PAGE SUPPRESSION SET, MUST BE   |
|       |      |         |        | /MUST BE NEGATIVE OF TABSET      |
| 00432 | 0001 | FORMFG, | 1      | /SUPPRESS FEED ADVANCE FLAG      |
| 00433 | 0000 | LINCNT, | 0      | /NEGATIVE OF LINES LEFT          |

## /TABULATE

|       |      |      |       |        |
|-------|------|------|-------|--------|
| 00434 | 1200 |      | TAD   | TAB1   |
| 00435 | 3231 |      | DCA   | MTABST |
| 00436 | 1230 |      | TAD   | TABSET |
| 00437 | 3367 | TAB, | DCA   | TABCT2 |
| 00440 | 1200 |      | TAD   | TAB1   |
| 00441 | 7440 |      | SZA   |        |
| 00442 | 5245 |      | JMP   | +.3    |
| 00443 | 7040 |      | CMA   |        |
| 00444 | 5766 |      | JMP I | RETURN |
| 00445 | 1367 |      | TAD   | TABCT2 |
| 00446 | 7510 |      | SPA   |        |
| 00447 | 5253 |      | JMP   | +.4    |
| 00450 | 2240 |      | ISZ   | TAB+1  |
| 00451 | 7200 |      | CLA   |        |
| 00452 | 5240 |      | JMP   | TAB+1  |
| 00453 | 3365 |      | DCA   | INIT   |
| 00454 | 1275 |      | TAD   | SPACE  |
| 00455 | 4263 |      | JMS   | TYPE   |
| 00456 | 2367 |      | ISZ   | TABCT2 |
| 00457 | 2365 |      | ISZ   | INIT   |
| 00460 | 5254 |      | JMP   | -.4    |
| 00461 | 1367 |      | TAD   | TABCT2 |
| 00462 | 5766 |      | JMP I | RETURN |



## /TYPE ROUTINE

```

00463 0000 TYPE, 0
00464 6046     TLS
00465 6041     TSF
00466 5265     JMP      --1
00467 7200     CLA
00470 5663     JMP I   TYPE

```

## /TEST FOR START OF PAGE, SUPPRESS FORMS AND LF

```

00471 0000 TSTPAG, 0
00472 1231     TAD      MTABST
00473 7450     SNA
00474 1232     TAD      FORMFG
00475 7640     SPACE,  SZA CLA
00476 5671     JMP I   TSTPAG /PAGE STARTED
00477 5766     JMP I   RETURN /NO CHARACTERS YET THIS PAGE

```

## /PROCESS CARRIAGE RETURN

```

00500 4271 CR,     JMS      TSTPAG
00501 2232     ISZ      FORMFG
00502 1377     TAD      (215
00503 4263     JMS      TYPE
00504 7240     STA
00505 4263     JMS      TYPE
00506 1376     TAD      (TAD TAB1
00507 3240     DCA      TAB+1
00510 7604     LAS
00511 7010     RAR
00512 7630     SZL CLA
00513 5234     JMP      TAB-3 /SWR(11)=1 => TAB FIRST
00514 1230     TAD      TABSET
00515 5766     JMP I   RETURN

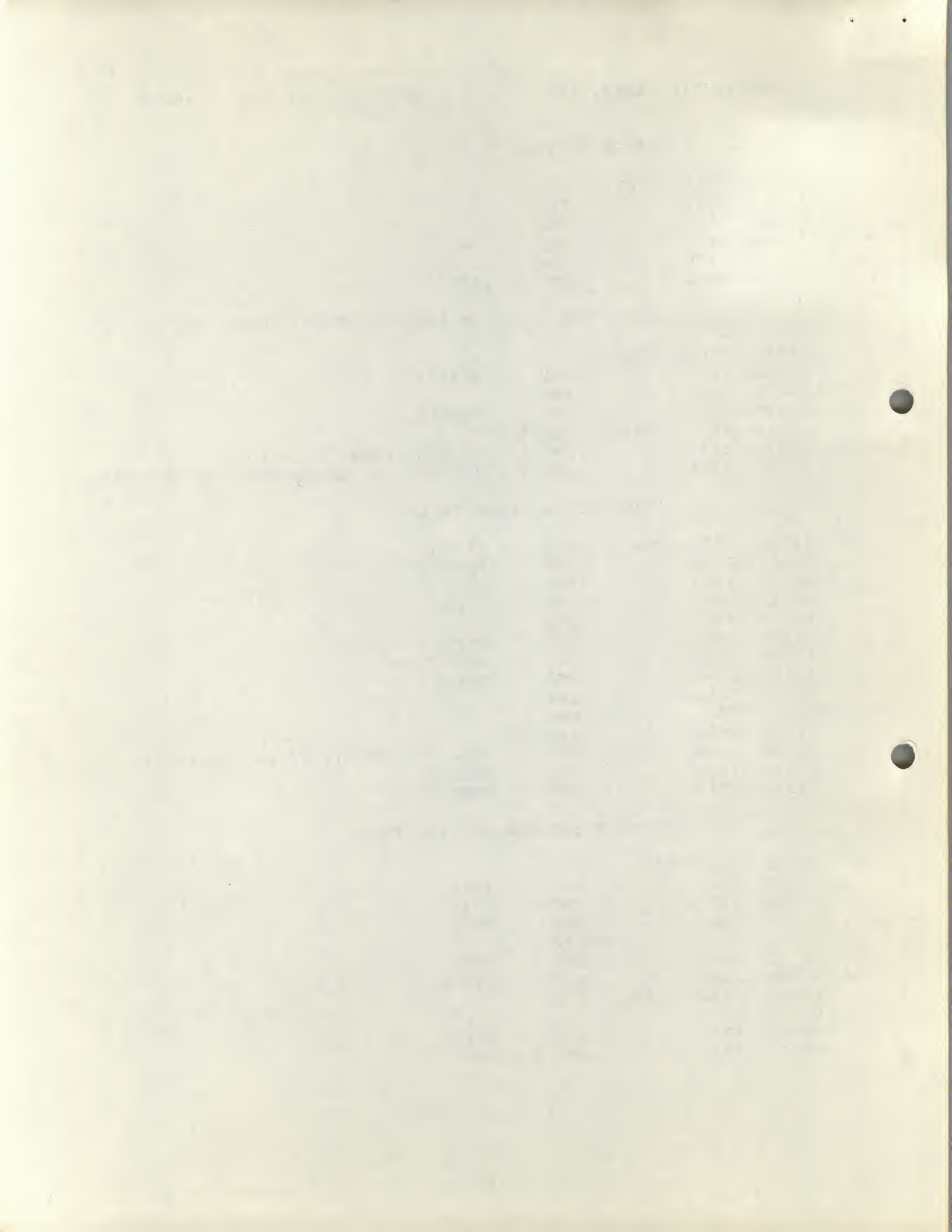
```

## /OUTPUT SEQUECR OF LINE FEEDS

```

00516 0000 NLF, 0
00517 3365     DCA      INIT
00520 1325     TAD      P212
00521 4263     JMS      TYPE
00522 7240     STA
00523 4263     JMS      TYPE
00524 2233     ISZ      LINCNT
00525 0212     P212, 212
00526 2365     ISZ      INIT
00527 5320     JMP      NLF+2
00530 5716     JMP I   NLF

```



## /OUTPUT A LINE FEED

```

00531 4271 LF,      JMS      TSTPAG
00532 7240          STA
00533 4316          JMS      NLF
00534 1233          TAD      LINCNT
00535 7710          SPA CLA
00536 5766          JMP I   RETURN

```

## /OUTPUT A FORM FEED, ASLO CONTINUE LF

```

00537 4271 FORM,   JMS      TSTPAG
00540 7604          LAS
00541 7710          SPA CLA
00542 5347          JMP      .+5
00543 7402          HLT
00544 7240          STA              /CLEAR KEYBOARD TRANSIENTS
00545 4263          JMS      TYPE
00546 5356          JMP      .+10
00547 1233          TAD      LINCNT
00550 1227          TAD      TAIL
00551 4316          JMS      NLF      /CLA FOR FORM FEEDS
00552 1375          TAD      (" -    /((214 FOR FORM FEEDS
00553 4263          JMS      TYPE
00554 1226          TAD      HEAD
00555 4316          JMS      NLF      /Optnl CLA FOR FORM FEEDS
00556 1225          TAD      LINSET
00557 3233          DCA      LINCNT
00560 3232          DCA      FORMFG
00561 5302          JMP      CR+2

```

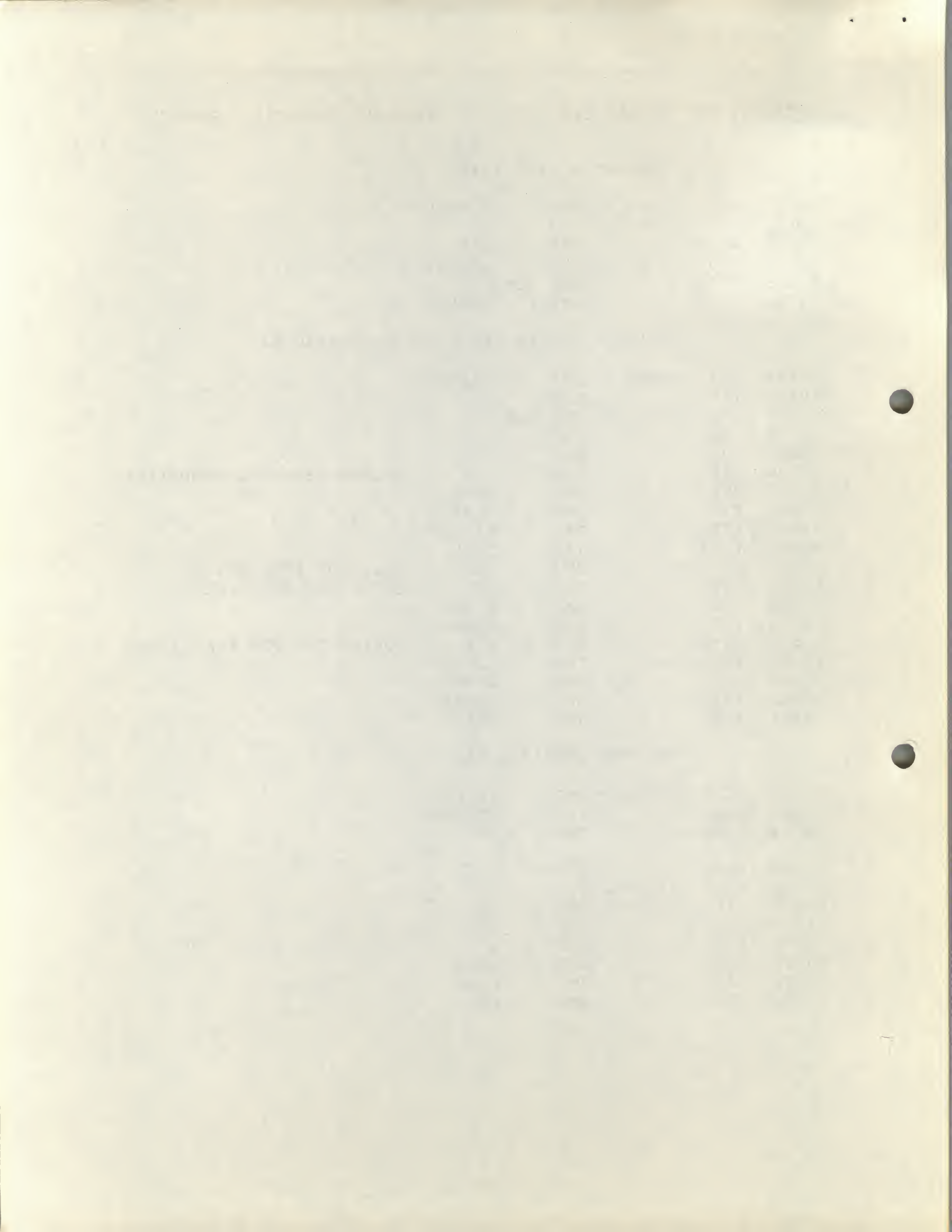
## /OUTPUT VERTICLE TAB

```

00562 4271 VTAB,   JMS      TSTPAG
00563 1224          TAD      VERTAB
00564 5333          JMP      LF+2

00565 0000 INIT,   0
00566 3366 RETURN, DCA      .
00567 5765 TABCT2, JMP I  INIT
00570 5237          JMP      TAB
00571 5331          JMP      LF
00572 5362          JMP      VTAB
00573 5337          JMP      FORM
00574 5300          JMP      CR

```

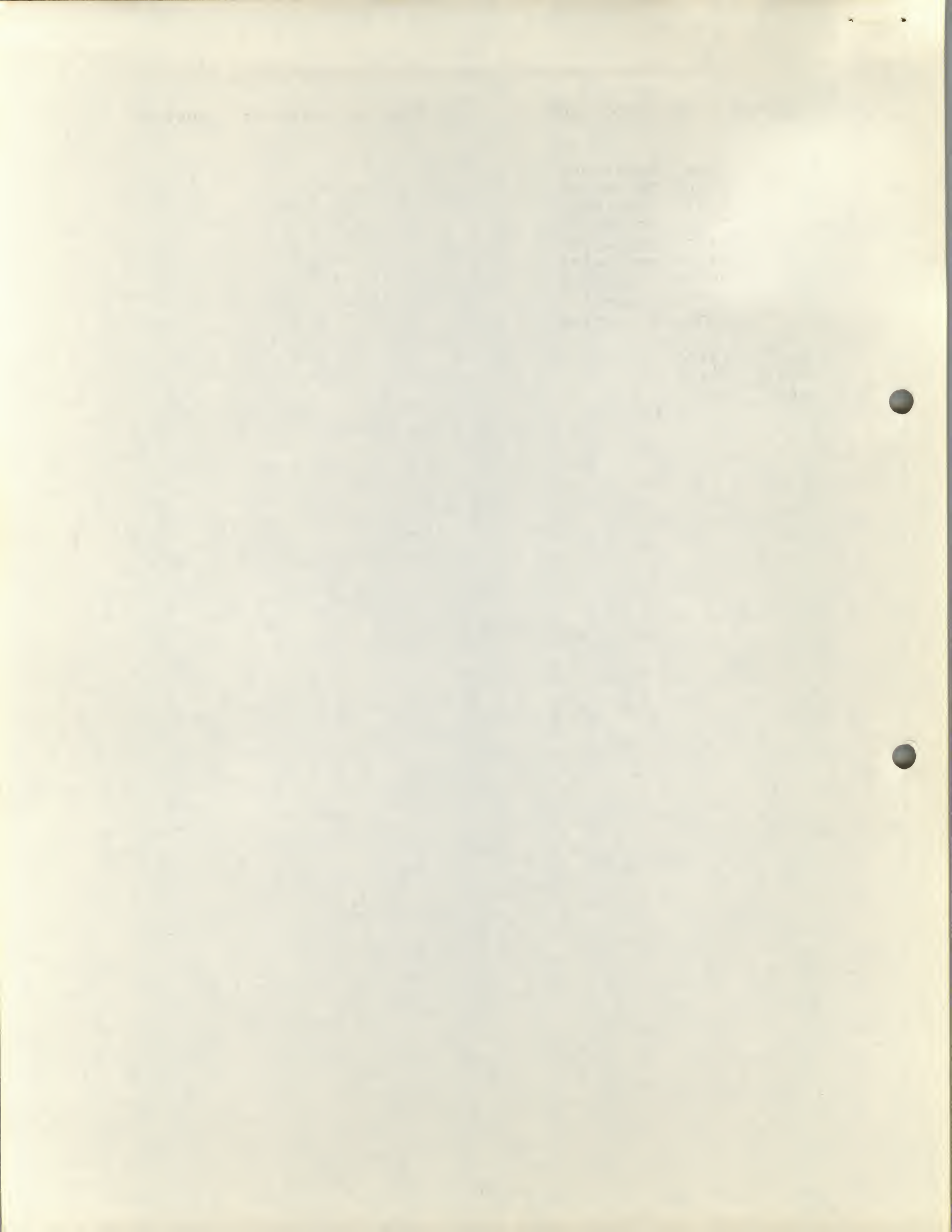




7344 STM2=7344  
7346 STM3=7346  
7305 STP2=7305  
7325 STP3=7325  
7307 STP4=7307  
7327 STP6=7327  
7332 ST2K=7332  
7330 ST4K=7330  
7333 ST6K=7333

00575 0255  
00576 1200  
00577 0215

\$



|        |      |             |
|--------|------|-------------|
| ADDR   | 0214 | XITFLD 0251 |
| ADDR2  | 0221 |             |
| CHAR   | 0217 |             |
| CNTIT  | 0244 |             |
| CORE   | 0215 |             |
| COUNT  | 0213 |             |
| CR     | 0500 |             |
| DFIELD | 0243 |             |
| ENTRY  | 0201 |             |
| ESC    | 0341 |             |
| EXIT   | 0246 |             |
| FORM   | 0537 |             |
| FORMFG | 0432 |             |
| HEAD   | 0426 |             |
| HOLD1  | 0216 |             |
| INIT   | 0565 |             |
| LF     | 0531 |             |
| LINCNT | 0433 |             |
| LINSET | 0425 |             |
| MTABST | 0431 |             |
| NLF    | 0516 |             |
| NOINIT | 0230 |             |
| PCDIF  | 0262 |             |
| P200   | 0307 |             |
| P212   | 0525 |             |
| P7400  | 0200 |             |
| P7600  | 0202 |             |
| P7700  | 0207 |             |
| REG    | 0344 |             |
| RETURN | 0566 |             |
| SPACE  | 0475 |             |
| STM2   | 7344 |             |
| STM3   | 7346 |             |
| STP2   | 7305 |             |
| STP3   | 7325 |             |
| STP4   | 7307 |             |
| STP6   | 7327 |             |
| ST2K   | 7332 |             |
| ST4K   | 7330 |             |
| ST6K   | 7333 |             |
| TAB    | 0437 |             |
| TABCNT | 0220 |             |
| TABCT2 | 0567 |             |
| TABSET | 0430 |             |
| TAB1   | 0400 |             |
| TAIL   | 0427 |             |
| TRETN  | 0336 |             |
| TSTPAG | 0471 |             |
| TYPE   | 0463 |             |
| TYPE1  | 0303 |             |
| TYPE2  | 0313 |             |
| VERTAB | 0424 |             |
| VTAB   | 0562 |             |
| WRITE  | 0253 |             |
| WRITE2 | 0271 |             |

