TITLE:       Output Format Control Subroutine

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CLASSIFICATION:   K4

ABSTRACT:    Controls the number of lines of computer output
per page, and effects a standard border at the
top and bottom of each page, by performing and
counting all the carriage returns in a program.
Instructions are given for use with 24.0 and
24.1.

DISCLAIMER:

DESCRIPTION:

If every carriage return instruction pair  xp1600'xz0000'  in a
program is replaced by the calling sequence  r(Lo+0052)'u(Lo+0032)'
of this subroutine, the carriage returns will be counted as well
as executed by the subroutine.  When the right number of lines to
fill the body of one page have been printed, extra carriage returns
will be executed to move the continuous form in the typewriter to
the next page with a suitable border between.

Obviously the automatic carriage return feature of the typewriter
can't be used with this program,    since automatic carriage returns
can't be counted.


Initializing entry:    This routine is initialized by the use of the
two consecutive instructions

$$R \quad (Lo + 0052)$$
$$U \quad (Lo + 0044).$$

It is recommended that this instruction pair be placed at the very
beginning of a program.  The initializing entry does not effect a
carriage return.


Normal entry:    In the body of the program, wherever a carriage
return is desired the two consecutive instructions

$$R \quad (Lo + 0052)$$
$$U \quad (Lo + 0032)$$

should be used.


Use with 24.0 Floating Point:

To have 24.0 interpret  xt0000  as a "controlled" carriage return
command, make the following changes:

| Location | Old Contents | New Contents |
|---|---|---|
| 0754 | T 0829 | T 0828 |
| 0828 | (blank) | R (Lo + 0052) |
| 0829 | B 0458 | U (Lo + 0032) |
| 0830 | T 0020 | U 0020 |

Use with 24.1 Floating Point:

To have 24.1 interpret  xt0000  as a "controlled" carriage return command, make the following changes:

| Location | Old Contents | New Contents |
|----------|--------------|--------------|
| 0128 | T 0257 | T 1759 |
| 1759 | (blank) | R (Lo + 0052) |
| 1760 | (blank) | U (Lo + 0032) |
| 1761 | (blank) | U 0535 |

Note:

The initializing entry  r(Lo+0052)'u(Lo+0044)'  must be made in fixed point, not interpreted by the floating point routine to be used.

Storage:  The program has been written to occupy the last half of any track.  Program Lo  referred to above does not mean the initial location of the program but rather the Set Modifier.  The program is stored beginning at  (Lo + 0032).

Time:  The program has been optimized so that carriage return execution time remains comparatively unchanged.

Tape Description:   The tape supplied by POOL is arranged:

Title, POOL number, date, 8 spaces, tape feed, coding, ";0006300' .0000000'", tape feed, sample program.

OPERATING INSTRUCTIONS:

(1) Store the subroutine in the second half of a track, Lo.
(2) Determine the total number of lines it is possible to print on a page using customary spacing.
(3) Determine the number of lines to be printed on each page during output, and load this number, at q=29, in (Lo + 0060).
(4) Subtract the number found in (3) from the total number of lines in (2), and load the difference, at q=29, in (Lo + 0036).

>    Example:  Suppose it is possible to print 66 lines
>    of output per page of continuous form and it is
>    desired to print out 50 lines of output per page.
>    Then:  load (Lo + 0060) with  xz0050  and
>           load (Lo + 0036) with  xz0016.
>
>    The program tape supplied contains these constants.

(5) Store the programs which use the subroutine.  They should start with the initialization calling sequence  r(Lo+0052)'u(Lo+0044)' and have  r(Lo+0052)'u(Lo+0032)'  each place a carriage return is desired.
(6) Adjust the paper.  In the example given, to obtain an upper border of  10  lines and a lower border of  6,  position the form to start printing on line 11.
(7) Start the program.

Note:  If most work at a particular installation is on the same size form, the appropriate constants can be calculated and inserted in the program tape in place of  xz0050  and  xz0016  for once and for all.

SAMPLE PROGRAM:

A sample program is supplied for illustration and testing, which simply prints one "x" on each line.  It is written for subroutine Lo = 6200 (that is, for the subroutine loaded using  ;0006232'/0006200')  and fills into the first seven sectors of that track.

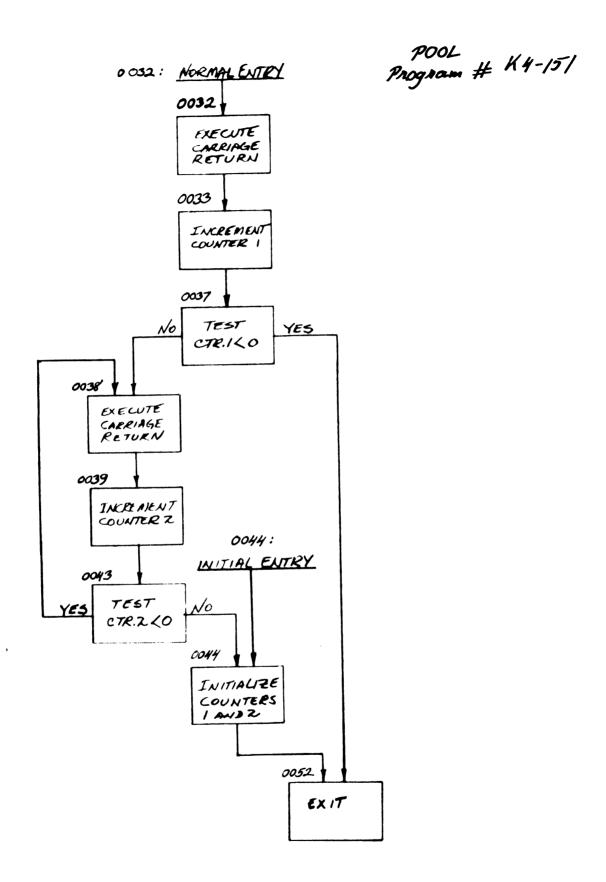The printout of the sample program tape follows:

SAMPLE PROGRAM FOR K4-151

;0006200'

```
xr6252'xu6244'   initializing
xp3900'xz0000'   print "x"
xr6252'xu6232'   controlled carriage return
xu6202'          repeat "x"
```

.0006200'

0032: NORMAL ENTRY

0032
EXECUTE
CARRIAGE
RETURN

0033
INCREMENT
COUNTER 1

0037
TEST
CTR.1 < 0
No ... YES

0038
EXECUTE
CARRIAGE
RETURN

0039
INCREMENT
COUNTER 2

0044:
INITIAL ENTRY

0043
TEST
CTR.2 < 0
YES ... No

0044
INITIALIZE
COUNTERS
1 AND 2

0052
EXIT

**BLOCK DIAGRAM- OUTPUT FORMAT CONTROL SUBROUTINE**

| | | | | |
|---|---|---|---|---|
| Job No. _____ | Prog. No. *K4-151* | Programmer *J. A. Donohoe* | Date *11-18-59* | |

POOL

Problem  *OUTPUT FORMAT CONTROL SUBROUTINE*  Track

| Program Input Codes | Stop | Location | Instruction Op. | Instruction Address | Stop | Contents of Address | Notes |
|---|---|---|---|---|---|---|---|
| ; 0.0.0 (Lo+3r) | ' | | | | | | |
| 6.0.0.0 (Lo+00) | ' | ⊠ | | | | | |
| | | 3.2 | X | P 1.6.18 | ' | | NORMAL ENTRY |
| | | 3.3 | B | 0.0.6r | ' | CTR 1 | |
| | | 3.4 | A | 0.0.63 | ' | 1 @ 29 | |
| | | 3.5 | H | 0.0.6r | ' | CTR 1 | |
| | | 3.6 | X | Z 0.0.16 | ' | BLANK LINES/PAGE & DELAY | |
| | | 3.7 | T | 0.0.52 | ' | CTR 1 < 0   YES | |
| | | 3.8 | X | P 1.6.24 | ' | | NO |
| | | 3.9 | B | 0.0.61 | ' ⊠ | CTR r | |
| | | 4.0 | A | 0.0.55 | ' | 1 @ 29 | |
| | | 4.1 | H | 0.0.61 | ' | CTR r | |
| | | 4.2 | X | Z 0.0.2.8 | ' | DELAY | |
| | | 4.3 | T | 0.0.3.8 | ' | CTR r < 0   YES | |
| | | 4.4 | C | 0.0.59 | ' | | NO: INITIAL |
| | | 4.5 | S | 0.0.60 | ' | | ENTRY |
| | | 4.6 | U | 0.0.47 | ' | | |
| | | 4.7 | C | 0.0.6r | ' ⊠ | | |
| | | 4.8 | U | 0.0.50 | ' | | INITIALIZE COUNTERS |
| | | 4.9 | | | ' | | |
| | | 5.0 | S | 0.0.3.6 | ' | | |
| | | 5.1 | C | 0.0.61 | ' | | |
| | | 5.2 | U | [    ] | ' | | |
| | | 5.3 | | | ' | | |
| | | 5.4 | | | ' | | |
| | | 5.5 | X | Z 0.0.0.1 | ' ⊠ | 1 @ 29 | |
| | | 5.6 | | | | | | |
| | | 5.7 | | | ' | | |
| | | 5.8 | | | | | | |
| | | 5.9 | [    ] | | ' | TEMP. | |
| | | 6.0 | X | Z 0.0.50 | ' | LINES/PAGE | |
| | | 6.1 | | | ' | CTR 2 | |
| | | 6.2 | [    ] | | ' | CTR 1 | |
| | | 6.3 | X | Z 0.0.0.1 | ' ⊠ | 1 @ 29 | |

' Conditional Stop Code   ⊠ Carriage Return