PROGRAM TITLE: DOLLAR AND CENT OUTPUT IN COLUMNS

PROGRAM CLASSIFICATION: Service

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PURPOSE: To provide a fast, fixed format, data
                           output on the typewriter in the format
                           $ 0000XXXX.XX or $ XXXX.XX which can
                           be typed in columns with the decimal
                           points aligned.

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1.   PURPOSE:

To provide a fast, fixed format, data output on the typewriter in the format
$ 0000XXXX.XX or $ XXXX.XX which can be typed in columns with the decimal
points aligned.

2.   METHOD:

The subroutine combines the methods of R.P.55T3 and R.P.55T5. It converts
the positive or negative binary number in the accumulator at b=39 to decimal,
types a figure shift, a $ sign, leading spaces, a minus sign or a space in-
stead of the plus sign, up to 8 significant digits, a decimal point, and the
two least significant digits of the number. The number is converted accurately
with no round-off error.

Examples:

$ 3572.25
$ 0.00
$ 0.95
$ 98765432.10
$-98765432.10
$ -32.10

There are options available to type a plus sign instead of the space, to sup-
press the $ sign, to type leading zeros instead of leading spaces and to select
the number of digits (including leading zeros or spaces) to be typed.

3.   RESTRICTIONS:

Don't attempt to use this subroutine for numbers exceeding 8 dollar digits
(i.e. 10 decimal cent-digits of the original number in the accumulator):
it would print out the 2 digits after the decimal point correctly, but would
print only the 8 most significant digits of the dollar-part.

4.   USAGE:

4.1 Calling Sequence

                                                   in cents
      α TRA [Origin of Subroutine]   (Number/in Accumulator @ 39)
          RETURN

(α is any left or right non-loop address)

4.2 Locations Used

This program is relocatable. The master tape contains at the end the relocating routine and is to be used as the sub-subroutines of R.P.55. The subroutine occupies memory locations origin to origin +0037 (octal). Both L and V loops are also used.

5. MODIFICATIONS:

The original tape is prepared to print a $ sign, spaces instead of lead-ing zeros for a total number of 8 dollar-digits, and a space instead of the + sign.

5.1 To ignore leading zeros, change Origin +0030 from +52.5252.1-52.5777.1 to +77.7777.1+77.7777.1. (The decimal points would not be aligned in the column with this modification.)

5.2 For leading zeros or spaces, change Origin +0030 to:

N	Print leading Zeros	Print leading Spaces
1	+77.7777.1+77.7777.1	+77.7777.1+77.7777.1
2	+03.7777.1+77.7777.1	+53.7777.1+77.7777.1
3	+00.1777.1+77.7777.1	+52.5777.1+77.7777.1
4	+00.0077.1+77.7777.1	+52.5277.1+77.7777.1
5	+00.0003.1+77.7777.1	+52.5253.1+77.7777.1
6	+00.0000.0-77.7777.1	+52.5252.1-77.7777.1
7	+00.0000.0-03.7777.1	+52.5252.1-53.7777.1
8	+00.0000.0-00.1777.1	+52.5252.1-52.5777.1

In addition, for leading zeros only, change:

```
Origin +0004 to +00.(Origin +0034.0) +51.7777.0
Origin +0005:    as outlined below, and in 5.3, 5.5
                 and 5.6
Origin +0006 to +12.7770.1+12.7775.1
Origin +0037 to +72.0003.0+57.(Origin +0005.1)
```

For leading zeros and space instead of + sign, change Origin +0005 to: +72.0004.0+72.0011.0

N equals the total number of dollar-digits to be printed including lead-ing zeros or spaces. If, however, the total number of significant dollar-digits in the number is greater than N, the complete number is printed (up to 8 dollar-digits). One digit before the decimal point is always printed.

5.3 For + sign instead of space, change

for leading spaces: Origin +0006 to +72.0021.0+12.7775.1
for leading zeros: Origin +0005 to +72.0021.0+72.0011.0
(and the other changes as in 5.2 for leading zeros)

5.4 To suppress the $ sign, for leading spaces, change

Origin +0004 to +40.0000.0+12.7770.1

5.5 To suppress the $ sign, for leading zeros, with space instead of the
+ sign, change (in addition to 5.2):
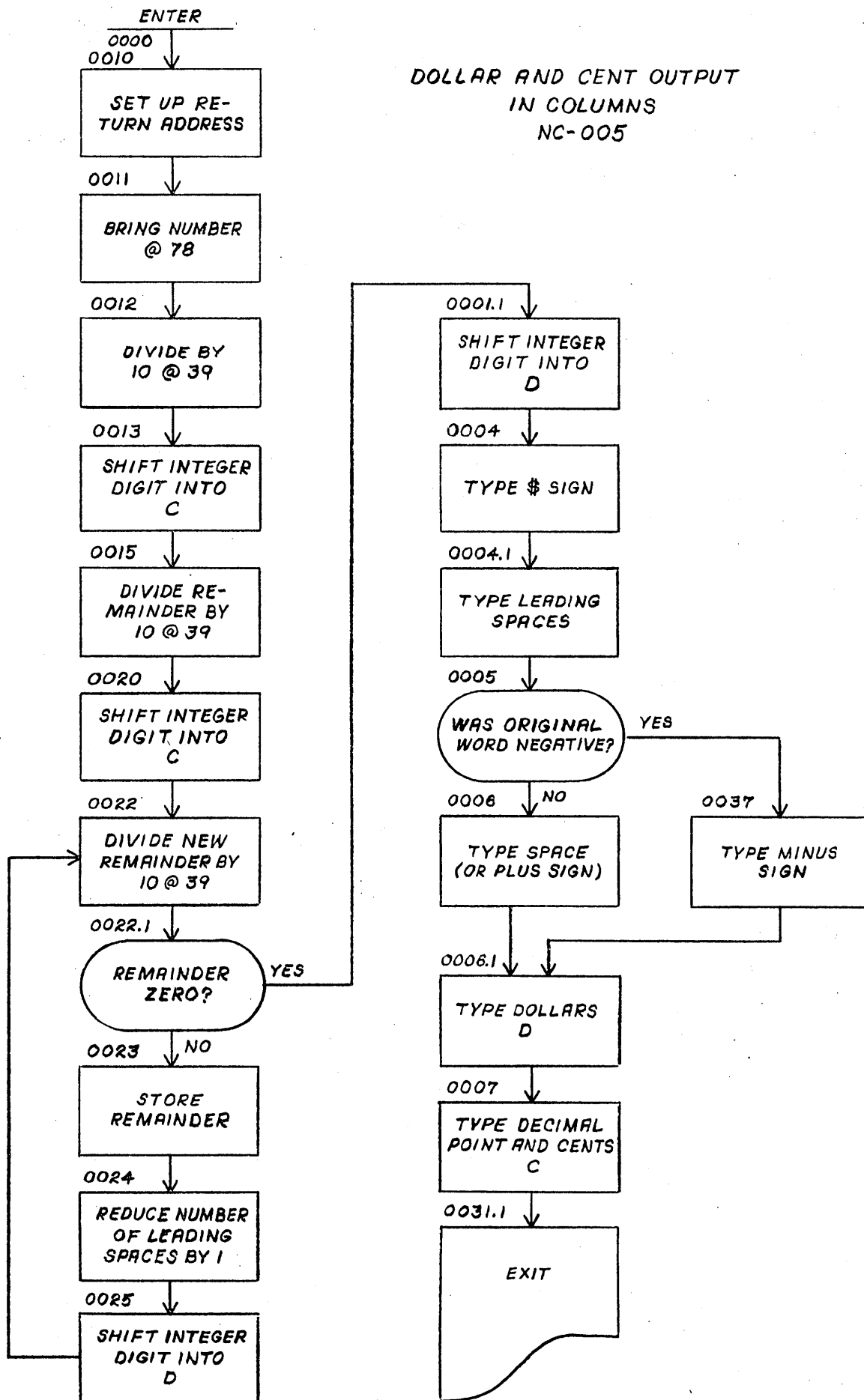
Origin +0005 to: +72.0004.0+40.0000.0

5.6 To suppress the $ sign, for leading zeros, with + sign, change (in
addition to 5.2):

Origin +0005 to +72.0021.0+40.0000.0

5.7 To print octal instead of decimal numbers, change

Origin +0032 from 10 @ 39 to 8 @ 39. All other variables
are controlled the same as the decimal output.

ENTER

0000

0010

SET UP RE-
TURN ADDRESS

0011

BRING NUMBER
@ 78

0012

DIVIDE BY
10 @ 39

0013

SHIFT INTEGER
DIGIT INTO
C

0015

DIVIDE RE-
MAINDER BY
10 @ 39

0020

SHIFT INTEGER
DIGIT INTO
C

0022

DIVIDE NEW
REMAINDER BY
10 @ 39

0022.1

REMAINDER
ZERO?

YES

NO

0023

STORE
REMAINDER

0024

REDUCE NUMBER
OF LEADING
SPACES BY 1

0025

SHIFT INTEGER
DIGIT INTO
D

DOLLAR AND CENT OUTPUT
IN COLUMNS
NC-005

0001.1

SHIFT INTEGER
DIGIT INTO
D

0004

TYPE $ SIGN

0004.1

TYPE LEADING
SPACES

0005

WAS ORIGINAL
WORD NEGATIVE?

YES

NO

0006

TYPE SPACE
(OR PLUS SIGN)

0037

TYPE MINUS
SIGN

0006.1

TYPE DOLLARS
D

0007

TYPE DECIMAL
POINT AND CENTS
C

0031.1

EXIT

DOLLAR AND CENT OUTPUT IN COLUMNS

0000.0	+15.0034.0	SAX	0020.0	+41.0037.0	ALS ←31_{10}
	+64.0010.0	CTL		+01.7771.0	ADD C
0001.0	+57.7760.0	TRA	0021.0	+60.7771.0	STO C
	+43.0000.0	XAR		+30.7773.0	FCA TS'
0002.0	+41.0043.0	ALS ←35_{10}	0022.0	+22.7772.0	DIV 10 @ 39
	+01.7775.0	ADD D		+50.0001.1	TZE done
0003.0	+60.7775.0	STO D	0023.0	+60.7774.0	STO TS
	+72.0033.0	TYC F/S		+00.7770.0	CLA S
0004.0	+72.0011.0	TYC $	0024.0	+41.0004.0	ALS ←4
	+12.7770.1	TYW S, leading spaces		+60.7770.0	STO S
0005.0	+00.0034.0	CLA orig.word	0025.0	+43.0000.0	XAR
	+51.7777.0	TMI →type -		+41.0043.0	ALS ←35_{10}
0006.0	+72.0004.0	TYC sp.	0026.0	+01.7775.0	ADD D
	+12.7775.1	TYW D,dollars		+40.0004.0	ARS →4
0007.0	+12.7771.1	TYW C,cents	0027.0	+60.7775.0	STO D
	+57.7771.1	TRA →exit		+57.7761.1	TRA
0010.0	+66.0030.0	CTV	0030.0	+52.5252.1	--- S
	+01.7771.0	ADD		-52.5777.1	---
0011.0	+42.7771.1	STA return addr.	0031.0	+60.0074.0	--- C
	+30.7773.0	FCA TS'		+57.0000.1	TRA exit
0012.0	+22.7772.0	DIV 10 @ 39	0032.0	+00.0000.0	--- 10 @ 39
	+60.7774.0	STO TS		-00.0005.0	---
0013.0	+43.0000.0	XAR	0033.0	+00.0000.0	--- TS'
	+41.0033.0	ALS ←27_{10}		-00.0000.0	---
0014.0	+01.7771.0	ADD C	0034.0	+00.0000.0	--- TS
	+60.7771.0	STO C		-00.0000.0	---
0015.0	+30.7773.0	FCA TS'	0035.0	+03.6000.0	--- D
	+22.7772.0	DIV 10 @ 39		-00.0000.0	---
0016.0	+60.7774.0	STO TS	0036.0	+74.0000.0	--- D+1
	+43.0000.0	XAR		-00.0000.0	---
0017.0	+64.0020.0	CTL	0037.0	+72.0003.0	TYC minus sign
	+57.7760.0	TRA		+57.0006.1	TRA