

- 1. IDENTIFICATION
- 1.1 Digital-8-22-U-Sym
- 1.2 Unsigned Decimal Print
- 1.3 June 7, 1965

## 2. ABSTRACT

This subroutine permits the typeout of the contents of a computer word as a 4-digit, positive, decimal integer.

## 3. REQUIREMENTS

### 3.1 Storage

This subroutine requires 38 core locations.

### 3.3 Equipment

Basic PDP-8 with ASR 33.

## 4. USAGE

### 4.1 Loading

The subroutine may be placed in core by use of the Binary Loader. See Digital-8-2-U-Rim for full details. The symbolic tape provided is either assembled with the user program or separately with the proper origin setting.

### 4.2 Calling Sequence

The subroutine is called by the usual JMS instruction with the number to be printed in the AC. Return to the location following that of the calling JMS.

## 5. RESTRICTIONS (Not Applicable)

## 6. DESCRIPTION

### 6.1 Discussion

This is a basic subroutine used to obtain decimal output corresponding to binary words in memory. The program operates in a straightforward manner. First the binary equivalent of 1000 is subtracted from the original number until a negative result is obtained. A count is kept of the number of subtractions necessary to accomplish this, thus yielding the most significant decimal digit. This process is repeated--using the proper power of ten, to give the three remaining decimal digits.

## 7. METHOD

### 7.1 Discussion

This method of binary to binary coded decimal conversion is compact and easily understood if it is not sophisticated. The latter consideration is of little consequence since the subroutine is output limited.

## 8. FORMAT

### 8.3 Output Data

Output is in the form of four consecutive decimal digits. No sign is printed. Spacing, tabulation, carriage return, etc. are not provided for in this subroutine. See Digital-8-19-U-Sym, which contains short subroutines for the latter purposes.

## 9. EXECUTION TIME

### 9.3 Average

This subroutine is output limited.

## 10. PROGRAM

### 10.4 Program Listing

```

/PDP-8 UNSIGNED DECIMAL PRINT
/CALL WITH NUMBER TO BE TYPED IN AC
/RETURN TO LOCATION FOLLOWING CALLING JMS
0200 0000  DECPRT, 0
0201 3243          DCA VALUE      /SAVE INPUT
0202 3244          DCA DIGIT      /CLEAR
0203 1235          TAD CNTRZA
0204 3245          DCA CNTRZB      /SET COUNTER TO FOUR
0205 1234          TAD ADDRZA
0206 3213          DCA ARROW      /SET TABLE POINTER
0207 7410          SKP
0210 3243          DCA VALUE      /SAVE
0211 7100          CLL
0212 1243          TAD VALUE
0213 1236  ARROW,  TAD TENPWR      /SUBTRACT POWER OF TEN
0214 7430          SZL
0215 2244          ISZ DIGIT      /DEVELOP BCD DIGIT
0216 7430          SZL
0217 5210          JMP ARROW-3     /LOOP
0220 7600          CLA            /HAVE BCD DIGIT
0221 1244          TAD DIGIT      /GET DIGIT
0222 1242          TAD K260       /MAKE IT ASCII
0223 6041          TSF            /OR = TAD DIGIT
0224 5223          JMP .-1        /JMP TDIG: SEE 8-19-U-SYM
0225 6046          TLS            /TYPE DIGIT

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0226	7600		CLA	
0227	3244		DCA DIGIT	/CLEAR
0230	2213		ISZ ARROW	/UPDATE POINTER
0231	2245		ISZ CNTRZB	/DONE ALL FOUR?
0232	5212		JMP ARROW-1	/NO: CONTINUE
0233	5600		JMP I DECPRT	/YES: EXIT
0234	1236	ADDRZA,	TAD TENPWR	
0235	7774	CNTRZA,	-4	
0236	6030	TENPWR,	-1750	/ONE THOUSAND
0237	7634		-0144	/ONE HUNDRED
0240	7766		-0012	/TEN
0241	7777		-0001	/ONE
0242	0260	K260,	260	
0243	0000	VALUE,	0	
0244	0000	DIGIT,	0	
0245	0000	CNTRZB,	0	
		\$		

11. DIAGRAMS (Not Applicable)

12. REFERENCES

Digital-8-19-U-Sym. Teletype Output Subroutines