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NASA CONTRACTOR REPORT 177375

CDCCRAY

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CDCCRAY

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Section 1

Purpose

CDCCRAY is a FORTRAN subroutine which runs on the Cray to convert either 32 bit or 64 bit binary data from a Control Data Corporation's "Cyber 2XX" computer to a corresponding 64 bit binary data for CRAY "1S or X-MP" computer.

Section 2

Usage

The entry point to the subroutine is CDCCRAY. To call the subroutine use the following FORTRAN statement:

```
CALL CDCCRAY (NWORDS, VECTRIN, VECTROUT, ITYPE, IERROR)
```

where the arguments have the following definition:

NWORDS	the number of CYBER 2XX words to be converted. Must be integer.
VECTRIN*	is a vector of CYBER 2XX 64 bit words to be converted to CRAY format. VECTRIN may be real or integer.
VECTROUT*	is a vector to receive the converted words. This vector is the result and is in CRAY format (binary). VECTROUT may be either real or integer.
ITYPE	is a value which specifies the type of conversion. (see table I) Must be integer.
IERROR	is a value assigned should an error be detected (see table II). Must be integer.

*note:

VECTRIN and VECTROUT may be the same vectors except when converting "CYBER 2XX" 32 bit words. When converting "CYBER 2XX" 32 bit words it is necessary for VECTRIN and VECTROUT to be unique vectors and VECTRIN contains two 32 bit words per each 64 bit word. The odd numbered words must be in the left half and the even numbered words in the right half.

Table I - Conversion Options

<u>ITYPE</u>	<u>Definition</u>
1	Integer conversion of "CYBER 2XX" to CRAY.
2	Real conversion of "CYBER 2XX" 64 bit words to CRAY 64 bit.
3	Real conversion of "CYBER 2XX" 32 bit words to CRAY 64 bit.

Table II - IERROR (Error Codes Returned)

<u>IERROR</u>	<u>Definition</u>
0	No errors
1	Argument value of NWORDS incorrect. NWORDS must be a positive integer.
2	Argument value of ITYPE incorrect. Value of ITYPE must be 1, 2, or 3 as shown in table I.
3	Arguments VECTRIN and VECTROUT are either the same or overlaps when converting real 32 bit values.
4	Can not convert a real variable. VECTRIN value was indefinite or not normalized. Result stored in VECTROUT is set to 64 one bits.
5	Can not convert an integer variable. VECTRIN was not in "CYBER 2XX" integer format. Result stored in VECTROUT is set to 64 one bits.*

*Notes: When IERROR is returned to calling module with a value of 1, 2, or 3 the call to CDCRAY was aborted and no conversion was attempted VECTRIN and VECTROUT remains as called.

When IERROR is returned to calling module with a value of 4 or 5 words which were convertible were converted.

Section 3

Storage

This subroutine requires 261 decimal words or 405 octal words of CRAY memory.

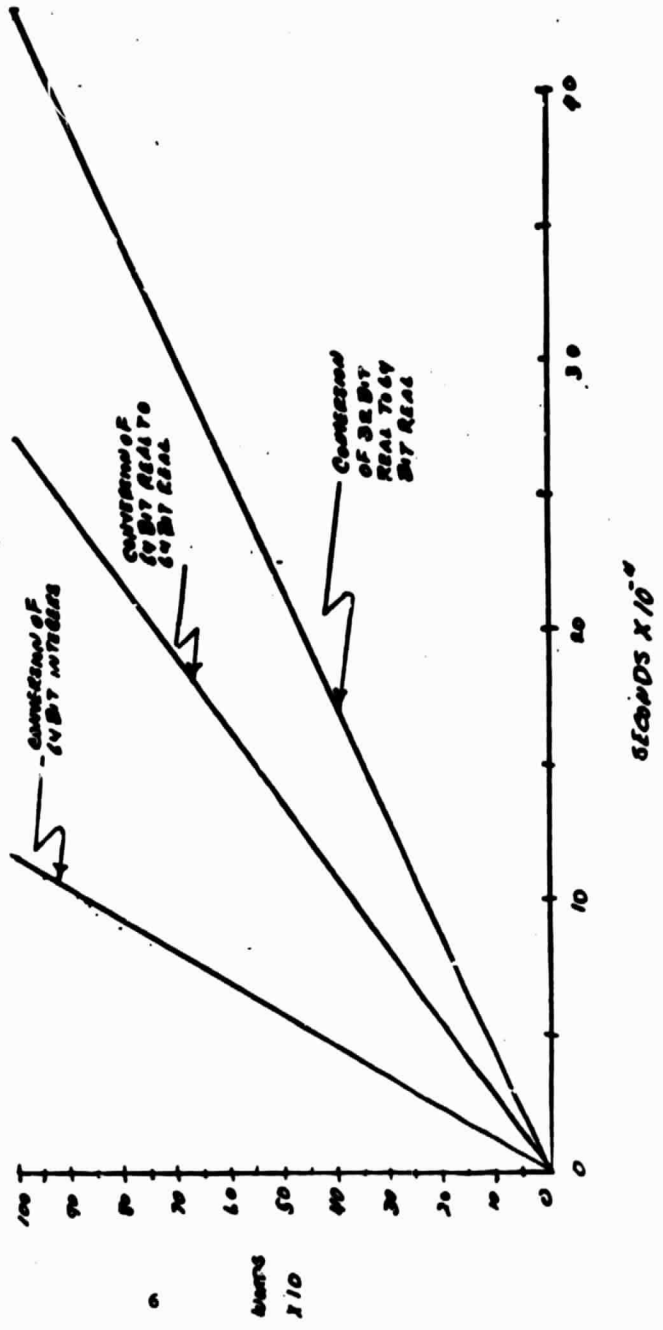
Section 4

Timing Considerations

Each group of fifty integers converted from the CYBER 2XX internal binary format to CRAY internal binary requires approximately $.56 \times 10^{-4}$ seconds. The conversion of fifty 64 bit real values in binary format requires approximately $.135 \times 10^{-3}$ seconds. A conversion of fifty real 32 bit binary words to 64 binary words requires approximately $.22 \times 10^{-3}$ seconds.

The approximate timings from 0 to 1000 words are shown in the following graph.

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Section 5

Linkage Editing

To use subroutine CDCCRAY the following job control language must be included in the users job stream before the program is executed.

```
ACCESS, DN=SOFTLIB, ID=SOFTLIB.  
LDR, LIB=SOFTLIB, etc.
```

Examples

Example 1. Convert a vector of 512 integers from the CYBER 2XX to a vector of integer for the CRAY. The input vector is ICYBER and the output vector is ICRAY.

```
INTEGER ICRAY(512), ICYBER(512)  
:  
:  
ITYPE=1  
KOUNT=512  
CALL CDCCRAY(KOUNT, ICYBER, ICRAY, KTYPE, IGOOF)  
IF (IGOOF .NE. 0) Go to error processing.  
:  
:
```

Example 2. Convert a vector of 257 CYBER 2XX 32 bit real numbers to CRAY real numbers. The input vector, CYBER, has 2 32 bit words per 64 bit word. The output vector, CRAY, receives the counted words.

```
DIMENSION CRAY(257), CYBER(129)  
:  
:  
N=257  
ITYPE=3  
CALL CDCCRAY(N, CYBER, CRAY, ITYPE, IERROR)  
IF(IERROR) .NE.0) Go to error processing  
:  
:  
END
```

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