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Concentrate and Disperse Character Strings

PARTIALLY OBSOLETE

Please note that this routine has been partially obsoleted in CNL 219. Users are advised not to use the entries refering to Hollerith any longer and to replace them in older programs. No maintenance for this part will take place and it will eventually disappear.

Suggested replacement: `CHPACK` (M432)

The concept *string of n Hollerith characters* is machine independent, but its usual representation in `Am` format (with `m` = character capacity of a machine word: `A10`, `A8`, `A6`, `A4`) is not.

Supposing any computer to have a character capacity of at least `A4`, string representations in `A4`, `A3`, `A2` or `A1` are transportable. Representations `A1` and `A4` are particularly interesting.

Fortran 77 defines a new data type `CHARACTER` though most compilers also support Hollerith strings (without a clear definition of the differences). A set of routines has been added to this package in its Fortran 77 implementation to convert between `CHARACTER` strings and Hollerith strings.

The routines `UBLOW`, `UBUNCH` and `UTRANS` work on Hollerith only **and so should be considered obsolete**, while `UCTOH`, `UCTOH1` and `UHTOC` and `UH1TOC` copy between `CHARACTER` and Hollerith. Unpredictable results will be obtained if wrong data types are passed to these routines. On most machines text strings passed in quotes are implicitly of type `CHARACTER` while a string preceeded by `nH` is not.

The routines of this package perform transformations between different representations.

Structure:

`SUBROUTINE` subprograms
User Entry Names: `UBUNCH`, `UBLOW`, `UTRANS`, `UCTOH`, `UCTOH1`, `UHTOC`, `UH1TOC`
`COMMON` Block Names and Lengths: `/SLATE/ NI,NJ,DUMMY(38)`

Usage:

```
CALL UBLOW(IVM,IV1,NCH)
```

disperses the string of `NCH` Hollerith characters from `IVM` into `IV1`.

`IVM` Input vector, continuous string of `NCH` Hollerith characters in `Am` form (i.e. `A10`, `A8` or `A4` depending on the machine).

`IV1` Output vector, `NCH` words in `A1` form, i.e. a single Hollerith character per word with blank-fill.

`NCH` Number of Hollerith characters to be copied.

```
CALL UBUNCH(IV1,IVM,NCH)
```

concentrates the string of `NCH` Hollerith characters from `IV1` into `IVM`.

`IV1` Input vector, `NCH` words in `A1` form (one Hollerith character per word).

`IVM` Output vector, continuous string of `NCH` Hollerith characters in `Am` form (i.e. `A10`, `A8` or `A4` depending on the machine), with blank-fill of trailing characters in the last word, if any.

`NCH` Number of Hollerith characters to be copied.

```
CALL UTRANS(IVI,IVJ,NCH,I,J)
```

copies the string of NCH Hollerith characters from IVI into IVJ.

IVI — Input vector of NCH Hollerith characters with I characters per machine word in Ai form. The variable NI in /SLATE/ is set to the number of machine words used from IVI.

IVJ — Output vector of NCH Hollerith characters with J characters per machine word in Aj form, with blank-fill. The variable NJ in /SLATE/ is set to the number of machine words built in IVJ.

NCH — Number of Hollerith characters to be copied.

I,J — Number of Hollerith characters per word in IVI and IVJ. If either I or J is greater than the maximum possible number of characters storable in a machine word then this maximum is used instead.

```
CALL UCTOH(MCH,IVJ,J,NCH)
```

copies the CHARACTER-type string in MCH into Hollerith characters in IVJ in Aj form.

MCH — Input vector of NCH characters, either of type CHARACTER or of type INTEGER holding Hollerith in Am form.

IVJ — Output vector of NCH Hollerith characters with J characters per machine word in Aj form, with blank-fill.

J — Number of Hollerith characters to put in each word of IVJ. If J is larger than the maximum possible number of Hollerith characters per word this maximum will be used instead.

NCH — Number of characters to copy.

```
CALL UCTOH1(MCH,IV1,NCH)
```

disperses the CHARACTER–type string in MCH into Hollerith characters in IV1 in A1 form.

MCH — Input vector of NCH characters, either of type CHARACTER or of type INTEGER holding Hollerith in Am form.

IV1 — Output vector, NCH words in A1 form, i.e. a single Hollerith character per word with blank-fill.

NCH — Total number of characters to copy.

```
CALL UHTOC(IVI,I,CHV,NCH)
```

copies the Hollerith characters in IVI into the CHARACTER variable CHV.

IVI — Input vector of NCH Hollerith characters with I characters stored per word in Ai form.

I — Number of Hollerith characters to take from each word of IVI. If I is larger than the maximum possible number of Hollerith characters per word this maximum will be used instead.

CHV — Output variable of type CHARACTER to receive NCH characters.

NCH — Number of characters to copy. If the CHARACTER variable CHV is of length greater than NCH trailing characters will not be changed.

```
CALL UH1TOC(IV1,CHV,NCH)
```

concentrates a Hollerith string in A1 form into the CHARACTER variable CHV.

IV1 — Input vector of NCH words containing one Hollerith character each in A1 form.

CHV Output variable of type CHARACTER to receive NCH characters.

NCH Total number of characters to copy. If the variable CHV is of length greater than NCH trailing characters will not be changed.

Error handling:

NCH $\leq$ 0 acts as do-nothing.

Examples:

(b = blank).

1) `CALL UBLOW(11HABCDEFGHIJK,V,11)`

fills V: $\mathtt{V(1)} = \mathtt{1HA}, \ldots, \mathtt{V(11)} = \mathtt{1HK}$, with blank padding of each word.

2) `CALL UBUNCH(V,X,11)`

gives the inverse transformation, thus on the CDC 7600 ($\mathtt{m} = 10$):

```
X(1) = 10ABCDEFGHIJ, X(2) = 10HKbbbbbbbb
```

3) `CALL UTRANS(X,Y,11,99,4)`

copies the continuous X string to A4 representation in Y:

```
Y(1) = 4HABCD, Y(2) = 4HEFGH, Y(3) = 4HIJKb
```

with blank padding if $\mathtt{m} > 4$.

4) `CALL UTRANS(Y,X,11,4,99)`

gives the inverse of example 3) .

5) `CALL UTRANS(V,X,11,1,99)`

gives the same result as example 2), but is much slower.

6)
```
DIMENSION V(4)
CHARACTER*14 C/'THIS IS A TEST'/
CALL UCTOH(C,V,4,14)
```

copies the CHARACTER string in C into V such that

```
V(1) = 4HTHIS, V(2) = 4HbISb, V(3) = 4HAbTE, V(4) = 4HSTbb
```

7)
```
DIMENSION V(4)
CHARACTER*14 C
DATA V /14HTHIS IS A TEST/   or   DATA V /4HTHIS,4H IS ,4HA TE,2HST/
CALL UHTOC(V,4,C,14)
```

copies the Hollerith strings in V into C such that C='THIS IS A TEST'.

8)
```
DIMENSION V(4)
CHARACTER*4 C/'TEST'/
CALL UCTOH1(C,V,4)
```

copies the CHARACTER–string in C into V such that

```
V(1) = 4HTbbb, V(2) = 4HEbbb, V(3) = 4HSbbb, V(4) = 4HTbbb
```

9)
```
DIMENSION V(4)
CHARACTER*4 C
DATA V/1HT,1HE,1HS,1HT/
CALL UH1TOC(V,C,4)
```

copies the Hollerith characters in V into the CHARACTER string C such that C='TEST'.

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