V.3.3-MERGE-TS MERGE TIME SERIES OPERATION

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Description: This Operation allows selection between time series with
the same information from different sources. There are two cases
included:

    Case 1: Merges an unlimited number of input time series to produce a
            single output time series. In general the input time series
            can contain missing values.

    Case 2: Specifies two precipitation or instantaneous discharge time
            series, with no missing values, in a preferred order. At
            run time the SWITCHTS MOD can be used to reverse the order
            for specified time periods thus merging the two time series.

A more complete description of each case is as follows:

Case 1: Case 1 of Operation MERGE-TS merges an unlimited number of input time series and produces a single output time series. Input time series are entered according to a user-assigned rank. Every value moved to the output time series is from the highest ranking input time series that has a value. The primary time series is always moved to the output time series. The Operation determines whether or not missing data are allowed in the output time series.

The following rules apply to case 1:

1.   All time series must have the same time interval. More than one value per time interval is allowed.

2.   All time series must have the same units and dimensions.

3.   The first (primary) input time series must allow missing data.

4.   Only the last input time series may be of the no-missing data type.

5.   If the output data type does not allow missing data then the last input time series must be of the no-missing data type.

6.   The output time series may be defined the same as the primary input time series but not any of the other subsequent time series.

Case 2: Case 2 of Operation MERGE-TS switches between a primary and secondary input time series at run time. The time series switch applies for a time interval specified in the SWITCHTS run-time modification. No missing data is allowed in the primary, secondary or output time series and only two input time series are permitted. The time series must be specified as precipitation with dimensions L and internal units of MM or instantaneous discharge with dimensions L3/T and internal units CMS. For example the user can switch between time series MAP and MAPX or between QINE and SQIN.

The following rules apply to case 2:

1.   All time series must have the same time interval. More than one value per time interval is not allowed.

2.   All time series must have the same units and dimensions.

3.   The output, primary (input) and secondary (input) time series must not allow missing data.

4.   Only two input time series are allowed with case 2.

5.   The output time series may be defined the same as the

primary input time series but may not be defined as the
secondary input time series.

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Allowable Data Time Intervals: 1, 2, 3, 4, 6, 8, 12 and 24 hours

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Time Series Used: Time series used in this Operation are as follows:

Case 1:

General Type	Dimn	Units	Use	Required	Form of Output T.S.	Data Time Interval	Missing Values Allowed
Output	any	any	O	yes	replaces	any	yes
Input	any 1/	any 1/	I	yes	n/a	any 1/	yes 2/

1/ Input time series information must match output time series
    information.

2/ All input time series except the last one must allow missing
    values. The first input time series must always allow missing
    values. The last input time series must not allow missing values
    if the input time series does not allow missing values.

Case 2:

General Type	Dimn	Units	Use	Required	Form of Output T.S.	Data Time Interval	Missing Values Allowed
Output	1/	1/	O	yes	replaces	any	no
Primary	2/	2/	I	yes	n/a	any 2/	no
Secondary	2/	2/	I	yes	n/a	any 2/	no

1/ Data types must be either precipitation (dimension = L and units =
    MM) or instantaneous discharge (dimension = L3/T and units = CMS).

2/ Must be the same as for the output time series.

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Input Summary: The card input for this Operation is as follows:

Card	Format	Columns	Contents
1	I5	1-5	Number of time series to be merged
	2X,2A4	8-15	Output time series identifier

```
        1X,A4     17-20    Output time series data type

         I5       21-25    Output time series time interval

        4X,I1      30      Case option flag:
                                0 = case 1 (default value)
                                1 = case 2 and precipitation time
                                    series
                                2 = case 2 and instantaneous discharge

   2      2A4      1-8     Input time series identifier

         3X,A4    12-15    Input time series data type
```

Repeat card 2 for each input time series in case 1. For case 2 the card 2 is for the primary time series then repeat card 2 for the secondary time series. Only two time series are allowed in case 2.

Sample Input and Output: Sample input is shown in Figure 1 [Bookmark]. Sample output from the parameter print routine is shown in Figure 2 [Bookmark]. There is no execution routine output.

Error and Warning Messages: The error and warning messages generated by this Operation and the corrective action to take when they occur are as follows:

1. **ERROR** UNITS FOR THE INPUT TIME SERIES (ID = XXXXXXXX, DATA TYPE = 'XXXX') (XXXX) DOES NOT MATCH UNITS FOR THE OUTPUT TIME SERIES (XXXX)

    Action: Units of all input time series must match those of the output time series.

2. **ERROR** THE FIRST INPUT T.S. ALWAYS HAS TO ALLOW MISSING DATA FOR CASE 1 OF THE OPERATION.

    Action: Check data type code of the first input time series to be sure that it allows missing data.

3. **ERROR** ONLY THE LAST INPUT T.S. MAY BE OF THE NO-MISSING DATA TYPE FOR CASE 1 OF THE OPERATION.

    Action: Check that all time series proceeding the last input time series are associated with data type codes that allow missing data.

4. **ERROR** NO TWO INPUT TIME SERIES CAN HAVE THE SAME COMBINATION OF IDENTIFIER AND DATA TYPE.

    Action: Check that every time series identifier and its

associated data type code are unique.

5. **ERROR** THE OUTPUT TIME SERIES DATA TYPE XXXX CANNOT CONTAIN MISSING DATA. XXXX CANNOT BE CREATED FROM TIME SERIES WHICH CAN CONTAIN MISSING DATA FOR CASE 1 OF THE OPERATION.

   Action: At least the last input time series must be of the no-missing data type.

6. **ERROR** THE OUTPUT TIME SERIES CANNOT CONTAIN MISSING DATA FOR CASE 2 APPLICATIONS.

   Action: Check that output time series is of the no-missing data type.

7. **ERROR** THE PRIMARY AND SECONDARY INPUT TIME SERIES CANNOT CONTAIN MISSING DATA FOR CASE 2 OF THE OPERATION.

   Action: Check that the input time series on input card number 2 are of the no-missing data type.

8. **ERROR** FOR CASE 2 THE OUTPUT TIME SERIES UNITS MUST BE OF DATA TYPE PRECIPITATION (DIMN=L, STANDARD UNITS=MM) OR INSTANTANEOUS DISCHARGE (DIMN=L3/T, STANDARD UNITS=CMS).

   Action: Check the output data type on input card 1.

9. **ERROR** FOR CASE 2 THE INPUT TIME SERIES UNITS MUST BE OF DATA TYPE PRECIPITATION (DIMN=l, STANDARD UNITS=MM) OR INSTANTANEOUS DISCHARGE (DIMN=L3/T, STANDARD UNITS=CMS).

10. **ERROR** ONLY ONE VALUE PER TIME INTERVAL IS PERMITTED FOR OUTPUT TIME SERIES WITH CASE 2 APPLICATIONS.

    Action: Check the number of values permitted for output data type.

11. **ERROR** ONLY ONE VALUE PER TIME INTERVAL IS PERMITTED FOR INPUT TIME SERIES WITH CASE 2 APPLICATIONS.

    Action: Check the number of values permitted for input data type.

12. **ERROR** INPUT TIME SERIES NO. (XX) CANNOT HAVE THE SAME TIME SERIES IDENTIFIER AND DATA TYPE CODE AS THE OUTPUT TIME SERIES, FOR ANY CASE OF THE OPERATION.

    Action: Check that the output time series identifier and data type code are defined differently from all input time series, with the exception of the primary input time series.

13. **WARNING** CASE OPTION FLAG (X) IN COLUMN 30 OF INPUT CARD 1 MUST BE SET TO 0, 1 OR 2. A DEFAULT VALUE OF 0=CASE 1, IS ASSUMED.

14. **WARNING** TWO INPUT TIME SERIES (PRIMARY AND SECONDARY) MUST
    BE SPECIFIED IN COLUMNS 1-5 OF INPUT CARD NO. 1 FOR CASE 2
    APPLICATIONS. A DEFAULT VALUE OF 2 IS ASSUMED.

    Action: Check to make sure that only two input cards 2 are used
    to input the primary and secondary time series to be switched.

Carryover Transfer Rules: This Operation has no carryover.

Card Punch Limitations: The values on the cards generated by the
punched card subroutine should be identical to the original cards
input for the Operation.

Figure 1. Sample Card Input For Operation MERGE-TS

```
    5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+

MERGE-TS   MAP
    2  KITM2POT MAPX     6    1
KITM2POT   MAPX
PETW2POT   MAP

MERGE-TS   QINE
    2  KITMMERG  QINE   6    2
KITM2POT   QINE
KITZTEST   QINE

MERGE-TS   STG
    2  KITMMERG STG      6    0
KITM2      STG
PETW2      STG
```

Figure 2. Sample Output From Operation MERGE-TS Print Parameter
           Routine

```
 ********************
 MERGE-TS OPERATION      NAME=MAP        PREVIOUS NAME=
 ********************

          MERGE TIME SERIES OPERATION

            2     TIME SERIES ARE TO BE MERGED
          CASE 2:  2 T.S. WITH NO MISSING DATA FOR USE WITH THE SWITCH T.S. MOD

          GENERAL TIME SERIES INFORMATION

               TIME INTERVAL (HOURS)              6
               VALUES PER TIME INTERVAL           1
               UNITS                              MM

          OUTPUT TIME SERIES INFORMATION

               ID.                            KITM2POT
               DATA TYPE                      MAPX
               MISSING DATA ALLOWED           NO

          INPUT TIME SERIES INFORMATION

                                              DATA         MISSING DATA
               T.S. RANK          ID.         TYPE           ALLOWED

               PRIMARY         KITM2POT       MAPX             NO
               SECONDARY       PETW2POT       MAP              NO
```