NOAA Eastern Region Computer Programs
and Problems NWS ERCP - No. 7

AUTOMATED HOURLY WEATHER COLLECTIVE FROM HRR DATA INPUT

Scientific Services Division
Eastern Region Headquarters
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The Eastern Region Computer Programs and Problems (ERCP) series is a subset of the Eastern Region Technical Memorandum series. It will serve as the vehicle for the transfer of information about fully documented AFOS application programs. The format of ERCP - No. 1 will serve as the model for future issuances in this series.

1 An AFOS version of the Flash Flood Checklist. Cynthia M. Scott, March 1981. (PB81 211252).

2 An AFOS Applications Program to Compute Three-Hourly Stream Stages. Alan P. Blackburn, September 1981. (PB82 156886).

3 PUPPY (AFOS Hydrologic Data Reporting Program). Daniel P. Provost, December 1981. (PB82 199720).

4 Special Search Computer Program. Alan P. Blackburn. April 1982.

5 Conversion of ALEMBIC$ Workbins. Alan P. Blackburn. October 1982. (PB83 138313).

6 Real-Time Quality Control of SAOs. John A. Billet, January 1983.

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Scientific Services Division
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UNITED STATES
DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary

National Oceanic and
Atmospheric Administration
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National Weather
Service
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Subprogram CURJTIME and routine PRODJTIME adapted from a program by Jack May, Eastern Region AFOS System Manager.

II. Application

A. Complete Program Description

The program HRR is a method for producing an automated Hourly Weather Wire Roundup through the use of AFOS product type HRR. The RDOS Real Time Clock is accessed for the current date and time; from these values several calculations are performed. The times (GMT and EDT) written into the output message are provided by the Mass Media Header routine of TOP.LB. Date and time are also used to determine if the available products are current. The program considers HRR's less than 16 minutes old as being current. An hourly report that has been composed more than 15 minutes prior to the time of program execution is labeled old and written as missing. If a report has been purged from the database, it is also written as missing.

HRR's that are labeled current are extracted from the database, edited into column alignment and then written to the output file. After all reports have been processed, the file is stored into the database and then deleted from its disk location. Upon storage, the message is automatically transmitted onto the SD/RD circuits and simultaneously to the Weather Wire through the asynchronous scheduler.

Since the NOAA Weather Wire is driven through a Model 28 ASR with a maximum of 72 characters per line, this program is set to output no more than 72 characters per line. Any HRR that contains more than the permitted number of elements after realignment will be truncated at the 72nd character.

This version of HRR.FR contains three separate programs: the main one, HRR.FR, and two subprogram subroutines, CURJTIME.FR and RDKEY.FR.

HRR.FR - writes the output message and simply works as a staging area from which runtime calls are made.

CURJTIME.FR - a routine adapted from a program by Jack May, ER ASM. This routine converts the system's current date and time into Julian time, expressed as minutes. This value is carried to subroutine RDKEY and compared to the current Julian time of the product being called.

RDKEY.FR - the multifunction routine of the program. The sequence of events within this subprogram are: open the AFOS product, calculate its Julian time, then compare it to the system's Julian time. If the difference in minutes is less than 16, the product is considered current and extraction begins. The report is scanned, bypassing all message headers until the first letter of the station's name is found. From this point, individual characters are transferred into an array until 72 characters have been moved or a carriage return has been encountered. Once this process has been completed, the next task is to assign the first character of each category within the observation to a specific column number. This is performed by keying on the occurrence of space characters. Whenever two or more spaces are encountered, the program assumes that the next nonspace character is another

category of the report, and therefore, places it in a specific column. If only one space is encountered, no shifting takes place, thereby allowing single spacing with a category. When all elements of an observation have been realigned, one line of data is returned to the main program and written as output.

B. Machine Requirements

The save file (HRR.SV) occupies 39 blocks of disk space. The program will execute in an environment of 12K background memory. Runtime is a mere 15 seconds. Only one channel is opened, and it's used strictly to write the output file.

C. Structure of Software

Figure 1 - Flowchart

D. Database

Products that are referenced in this version:

WBCHRRILG WBCHRRBWI WBCHRRDCA WBCHRRIAD

File/Product created:

WBCHRRDE

III. Procedures

A. Preparations

Separately compile each program/subprogram.

Loading:

RLDR HRR CURJTIME RDKEY <BG UTIL TOP FORT>.LB

(Be sure to use a TOP.LB dated 8/14/82 or later.)

No other preparations are needed once the program is loaded. Just execute from an ADM...RUN:HRR

B. Example of Program's Input and Output

See Figure 2.

C. Cautions or Restrictions on Use

As written this program will read and write only one line of data for each HRR. Stations currently using two lines for an hourly report should be able to place their second line of data into the remarks category on line one.

Since there is no strict format for the composition of HRR's, this program was written in a manner that would allow it to accept and process hourly reports regardless of how they are entered. Also, since there are no guarantees that all products are always transmitted,

stored or extracted without error, several checks have been placed within the program, so that if data is not found where expected, a particular HRR may be shortened at the point of error or written as missing, but the entire program will run to a successful completion every hour.

D. Adaptation to Other Stations

This program can easily be adapted to an AFOS site currently using a manual procedure to generate an hourly weather roundup. The main program would have to be edited and/or expanded to accommodate the key names of the HRR's to be processed. The two subroutines would be loaded as written.

E. Complete Source Program Listing

Figure 1 - System Flowchart

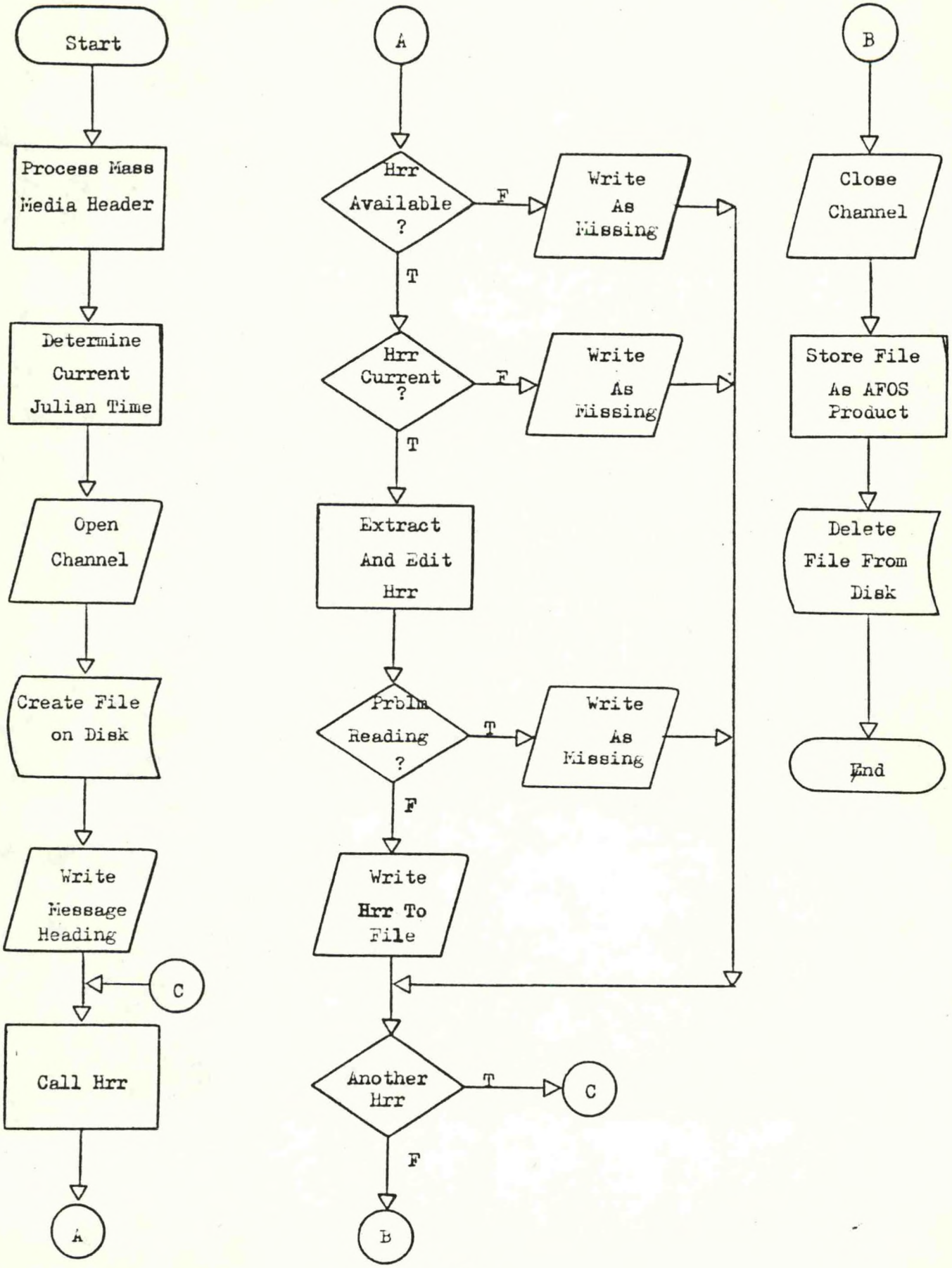

Figure 2 - Program Input/Output

```
WBCHRRILG
WOUS00 KILG 270700

WILMINGTON  CLOUDY    43/6     65     N13 G24  30.29R
WBCHRRBWI
WOUS00 KBWI 270700

BWI ARPT    CLOUDY    47/8     58     NW17G28  30.28R  C48/9   DP 33
WBCHRRDCA

WASHINGTON  LT SHWRS  50/10    56     NNW16    30.30R
WBCHRRIAD

DULLES      CLOUDY    48/03C   58     N12      30.29R


WBCHRRDE
SXUS2 KILG 270657
HOURLY WEATHER ROUNDUP FOR DELAWARE...MARYLAND AND VIRGINIA
NATIONAL WEATHER SERVICE WILMINGTON DE
157AM EST SAT NOV 27 1982

STATION      SKY/WX       TEMP    RH   WIND      BARO/TEND  REMARKS
                          F/C
WILMINGTON   CLOUDY       43/6    65   N13 G24   30.29R
BWI ARPT     CLOUDY       47/8    58   NW17G28   30.28R     C48/9   DP 33
WASHINGTON   LT SHWRS     50/10   56   NNW16     30.30R
DULLES       CLOUDY       48/03C  58   N12       30.29R

WBCHRRILG
WOUS00 KILG 271200

WILMINGTON  CLOUDY    39/4     70     NW 8     30.37R  MIN TEMP 39
WBCHRRBWI
WOUS00 KBWI 271200

BWI ARPT    CLOUDY    41/5     59     NW10     30.40R  C43/6   DP28
WBCHRRDCA

WASHINGTON  CLOUDY    44/7     51     NW13     30.43R  MIN 43/6
WBCHRRIAD

DULLES      CLOUDY    42/06C   59     NNW11    30.41R


WBCHRRDE
SXUS2 KILG 271157
HOURLY WEATHER ROUNDUP FOR DELAWARE...MARYLAND AND VIRGINIA
NATIONAL WEATHER SERVICE WILMINGTON DE
657AM EST SAT NOV 27 1982

STATION      SKY/WX       TEMP    RH   WIND      BARO/TEND  REMARKS
                          F/C
WILMINGTON   CLOUDY       39/4    70   NW 8      30.37R     MIN TEMP 39
BWI ARPT     CLOUDY       41/5    59   NW10      30.40R     C43/6   DP28
WASHINGTON   CLOUDY       44/7    51   NW13      30.43R     MIN 43/6
DULLES       CLOUDY       42/06C  59   NNW11     30.41R
```

```
C     PRGM "HRR" PRODUCES AN HOURLY WX ROUNDUP FOR NOAA WX WIRE.
C     L. CEDRONE WSO WILMINGTON DE.     SEPTEMBER 24 1982
      INTEGER DTG(20)
      DIMENSION IOUT(36)
      CALL MMHDR (1,DTG,IER)
      CALL CURJTIME (CURJT)
      CALL OPEN (1,"WBCHRRDE ",2,IER,512)
      WRITE (1,7)
    7 FORMAT (1X,"WBCHRRDE E  ","<177777><177777>","50","<305><200>")
      WRITE (1,9) (DTG(J),J=1,6)
    9 FORMAT (/1X,"<12>","SXUS2 KILG ",6I1,/1X,"<12>","HOURLY WEATHER ",
     C"ROUNDUP FOR DELAWARE...MARYLAND AND VIRGINIA",/1X,"<12>",
     C"NATIONAL WEATHER SERVICE WILMINGTON DE")
      WRITE (1,10) (DTG(J),J=7,20)
   10 FORMAT (1X,"<12>",14A2,/,1H0,"<12>",/1X,"<12>","STATION",5X,
     C"SKY/WX",6X,"TEMP",3X,"RH",4X,"WIND",6X,"BARO/TEND",2X,
     C"REMARKS",/,1X,"<12>",T28,"F/C"/)
   99 FORMAT (1X,"<12>",36A2)
      CALL RDKEY ("WBCHRRILG",CURJT,IOUT,$100)
      WRITE (1,99) (IOUT(I),I=1,36)
      GOTO 104
  100 WRITE(1,102)
  102 FORMAT (1X,"<12>","WILMINGTON",T23,"...MISSING")
  104 CALL RDKEY ("WBCHRRBWI",CURJT,IOUT,$106)
      WRITE (1,99) (IOUT(I),I=1,36)
      GOTO 110
  106 WRITE (1,108)
  108 FORMAT (1X,"<12>","BWI ARPT",T23,"...MISSING")
  110 CALL RDKEY ("WBCHRRDCA",CURJT,IOUT,$112)
      WRITE (1,99) (IOUT(I),I=1,36)
      GOTO 116
  112 WRITE (1,114)
  114 FORMAT (1X,"<12>","WASHINGTON",T23,"...MISSING")
  116 CALL RDKEY ("WBCHRRIAD",CURJT,IOUT,$120)
      WRITE (1,118) (IOUT(I),I=1,36)
  118 FORMAT (1X,"<12>",36A2,/,"<12><203>")
      GOTO 124
  120 WRITE (1,122)
  122 FORMAT (1X,"<12>","DULLES",T23,"...MISSING",/,"<12><203>")
  124 CALL CLOSE (1,IER)
      CALL FSTORE ("WBCHRRDE ",0,IER)
      CALL WAIT (5,2,IER)
      CALL DFILW ("WBCHRRDE ",IER)
      STOP
      END
```

```
C     SUBROUTINE "CURRENT JULIAN TIME" IN MINUTES ADAPTED FROM
C     PROGRAM BY JACK MAY, EASTERN REGION ASM
      SUBROUTINE CURJTIME (CURJT)
      DIMENSION IDATE(3)
      REAL LYEAR
      CALL DATE (IDATE,IER)
      CALL FGTIM (IHR,MIN,ISEC)
C
C     TEST FOR LEAP YEAR...IF LEAPYEAR, LYEAR WILL =0
      LYEAR=(FLOAT(IDATE(3))/4.)-INT(FLOAT(IDATE(3))/4.)
C
      CURJT=0
      IF(IDATE(1).GE.2) CURJT=CURJT+44640.        ;ADD JAN MINUTES
      IF(IDATE(1).GE.3) CURJT=CURJT+40320.        ;ADD FEB MINUTES
      IF(LYEAR.EQ.0.) CURJT=CURJT+1440.           ;ADD LEAP YEAR MINUTES
      IF(IDATE(1).GE.4) CURJT=CURJT+44640.        ;ADD MAR MINUTES
      IF(IDATE(1).GE.5) CURJT=CURJT+43200.        ;ADD APR MINUTES
      IF(IDATE(1).GE.6) CURJT=CURJT+44640.        ;ADD MAY MINUTES
      IF(IDATE(1).GE.7) CURJT=CURJT+43200.        ;ADD JUN MINUTES
      IF(IDATE(1).GE.8) CURJT=CURJT+44640.        ;ADD JUL MINUTES
      IF(IDATE(1).GE.9) CURJT=CURJT+44640.        ;ADD AUG MINUTES
      IF(IDATE(1).GE.10) CURJT=CURJT+43200.       ;ADD SEP MINUTES
      IF(IDATE(1).GE.11) CURJT=CURJT+44640.       ;ADD OCT MINUTES
      IF(IDATE(1).GE.12) CURJT=CURJT+43200.       ;ADD NOV MINUTES
C
      CURJT=CURJT+(IDATE(2)-1)*1440.              ;ADD DAYS SINCE LAST MONTH
      CURJT=CURJT+(IHR*60.)                       ;ADD # OF HRS SINCE MIDNIGH
      CURJT=CURJT+FLOAT(MIN)                      ;ADD MINUTES
      IF(ISEC.GE.30) CURJT=CURJT+1.               ;ROUND OFF MINUTES
      RETURN
      END
```

```
C     SUBROUTINE TO...CHECK TIME OF, EXTRACT, AND EDIT HRRS
C     L. CEDRONE  WSO WILMINGTON DE
      SUBROUTINE RDKEY (KEY,CURJT,IOUT,IERR)
      DIMENSION IBUFU(256),IBUFP(128),ISET(73),IOUTU(72)
      DIMENSION KRECU(40),IOUT(36),KREC(20),KEY(5)
      CALL KSRCF (KEY,KREC,IER)
      IF(IER.NE.1) RETURN IERR
      CALL UNPACK (KREC,40,KRECU)          ;ROUTINE OF PRODJT ADAPTED
      PRODJT=0.                            ;FROM PRGM BY JACK MAY,
      XNUM1=KRECU(19)*(2.**14)             ;ER ASM
      XNUM2=KRECU(20)*(2.**7)              ;
      PRODJT=XNUM1+XNUM2+KRECU(21)         ;PRODUCT'S JULIAN TIME
C
C     IF DIF IS GREATER THAN 15 MINS. THE HRR IS OLD & WRITTEN AS MISSING
C
      DIF=CURJT-PRODJT
      IF(DIF.GT.15) RETURN IERR            ;OLD??  IF TRUE WRITE AS MISSING
      CALL RDBKF (0,IBUFP,IER)
      IF(IER.NE.1) RETURN IERR
      DO 3 K=1,72
           ISET(K)=40K                     ;INITIALIZE ARRAY ISET TO SPACES
    3      IOUTU(K)=40K                    ;INITIALIZE ARRAY IOUTU TO SPACES
      CALL UNPACK (IBUFP,256,IBUFU)
      I=25                                 ;PYPASS BLOCK AND MSG HEADINGS
    5 IF(IBUFU(I).EQ.15K) GOTO 7           ;SEARCH FOR END OF WOUS LINE
      I=I+1
      GOTO 5
    7 I=I+1                                ;FIND 1ST LETTER OF STA. NAME
      IF(IBUFU(I).GT.100K.AND.IBUFU(I).LT.133K) GOTO 9
      GOTO 7
    9 DO 10 J=1,72                         ;TRANSFER MAXIMUM OF 72 CHARACTERS
       ISET(J)=IBUFU(I)                    ;OF OBSVTN, OR UNTIL A LF IS READ
       I=I+1
       IF(IBUFU(I).EQ.203K) RETURN IERR    ;PROBLEM READING MESSAGE
       IF(IBUFU(I).EQ.12K) GOTO 12
   10 CONTINUE
   12 ISET(73)=100K                        ;PLACE AN "@" AT END OF ARRAY
      L=1
      M=1                                  ;COLUMN FOR STATION'S NAME
      N=1
   15 GOTO (20,24,26,28,30,32,34)N
   20 CALL NBLANK (ISET,L)                 ;SEARCH FOR NON SPACE CHARACTERS
      IF(ISET(L).EQ.15K.OR.L.GE.72) RETURN IERR
   21 IOUTU(M)=ISET(L)                     ;TRANSFER REPORT & ALIGN COLUMNS
      M=M+1
      L=L+1
      IF(L.EQ.72.OR.M.EQ.72) GOTO 90       ;PROBLEM IN READING
      IF(ISET(L).EQ.40K) GOTO 22
      GOTO 21
   22 L=L+1
      IF(L.EQ.72) GOTO 90                  ;PROBLEM IN READING
      IF(ISET(L).EQ.40K) GOTO 23
      L=L-1
      GOTO 21
   23 N=N+1
      GOTO 15
C THE VALUE OF M DEFINES COLUMN LOCATION. IF THE INPUT RECORD IS NOT
```

```
C IN A FORMAT COMPATIBLE TO THE PROGRAM...(HAVING 2 OR MORE SPACES BETWEEN
C EACH WX CATEGORY)...NOT ALL COLUMNS WILL BE IN LINE!
   24 IF(M.GT.13) GOTO 23
      M=13                                    ;COLUMN FOR SKY/WX
      GOTO 20
   26 IF(M.GT.25) GOTO 23
      M=25                                    ;COLUMN FOR TEMP
      GOTO 20
   28 IF(M.GT.32) GOTO 23
      M=32                                    ;COLUMN FOR RH
      GOTO 20
   30 IF(M.GT.38) GOTO 23
      M=38                                    ;COLUMN FOR WIND
      GOTO 20
   32 IF(M.GT.48) GOTO 23
      M=48                                    ;COLUMN FOR BAROMETER
      GOTO 20
   34 L=L+1
      IF(ISET(L).NE.40K) GOTO 50              ;REMARKS??
      IF(L.EQ.72) GOTO 90
      GOTO 34
   50 M=59                                    ;COLUMN FOR REMARKS
   55 IOUTU(M)=ISET(L)
      M=M+1
      L=L+1
      IF(ISET(L).EQ.100K) GOTO 90             ;READ TO END OF INPUT ARRAY
      IF(M.EQ.72) GOTO 90
      GOTO 55
   90 CALL PACK (IOUTU,72,IOUT)
      RETURN
      END
```

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