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Description Notes "This is a guide to using the HOPP, a computer program designed to answer the question, 'During what time intervals was unit X in proximity to spray missions of herbicide orange?'"

Herbicide Orange Proximity Program

(HOPP)

This is a guide to using the HOPP, a computer program designed to answer the question, "During what time intervals was unit X in proximity to spray missions of herbicide Orange ?"

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202-697-1731/2439

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FILEDEF 05 DSK HOPP FILES LRECL 80 BLKSIZE 80 RECFM F
FILEDEF 06 DSK HOPP COMMENT
FILEDEF 09 CON
FILEDEF 10 DSK HOPP PATHS LRECL 80 BLKSIZE 8000 RECFM FB
FILEDEF 12 DSK HOPP REPORT LRECL 80 BLKSIZE 800 RECFM FB
LOAD HOPP
START
CLOSED PRINTER OFF
O PRINTC HOPP COMMENT
O PRINT HOPP FILES
O PRINTC HOPP REPORT
CLOSED PRINTER ON
```

* The Herbicide Orange Proximity Program (HOPP) needs the Job Control Cards above for execution on the IBM 360 CMS.

- * File 05 is user generated input data and run parameters. Three examples of this file are on the following pages.
- * File 06 contains comments on the run.
- * File 09 is for console monitoring of the run.
- * File 10 Contains the herbicide Orange flight path data that comes from the HERBO-2 tape of all RVN herbicide missions. The data has been organized into points and segments referenced to a rectangular coordinate system. Corrections to the HERBO-2 data have been made where possible.
- * File 12 is the HOPP REPORT. It lists the time periods for which a unit (individual) was "in proximity" to agent Orange flight paths. The parameters that can be used for defining proximity are time and distance (both are specified in File 05). Distance will be from the centerline of the flight path to the unit location (enter in 10ths of kilometers). Time will be the period after a spraying for which the agent is considered potent (enter the number of days). In addition to the "Proximity Periods" for the unit, File 12 also lists the flight paths that were within the "proximity criteria", i.e., the flight paths that were within the distance specified during the time interval selected for potency.
- * Files 06 and 12 could be combined.
- * Files 05, 06 and 12 are printed out to (a) check the input, (b) check for run errors and (c) get the "answer", respectively.
- * A detailed discussion of the files is included in the program comment cards.

1 1

ALPHA COMPANY, 3RD PAR

005 050 100 000

014 042 000

660901 XD976565

660902 ~~XD976565~~

660906 YD244597

660910 XD975969

660911 XD970573

660914 XD963582

660916 XD962605

660917 XD962600

660919 XD976565

660921 ~~RR999999~~

660927 XD974594

661001 YD241598

661010 YD242607

661015 YD148604

661017 YD242607

661019 YD148604

661022 YD175615

661025 YD148604

661030 YD242607

661101 YD885132

661102 YD850210

661201 YD885132

661204 YD401399

661210 YD885132

661215 YD750030

670214 _____

= The program will insert this location for the 2nd through the 5th of Sep 66 and switch to YD244597 for the 6th through 9th, etc.

- For periods "out of country", enter "RR999999" for the location along with the exit date.

NOTE: Dates must be in ascending order.

- The last location for each unit must be blank.

* This file 05 is set up for one unit.

1st line - Format(2I5) 1st "1" indicates one unit being processed.
2nd "1" is not needed for one unit runs, but it must be less than "2".

2nd line - Format(16A4) Unit name (up to 64 characters)

3rd line - Format(6F5.1) Distance criteria in 10ths of kilometers.
Up to 6 values may be entered.

4th line - Format(6I6) Time intervals in days. Up to 6 values

5th to 30th lines - Format(4X,3I2,2X,2A1,2I3) Date of arrival at a location and location(UTM grid coordinates).

Note: Last date is date of departure from RVN and location for this date must be BLANK.

2 1

ALPHA COMPANY, 3RD BAR

005 050 100 000

014 042

} - Proximity criteria

660901 XD976565

660902 XD986593

660906 YD244597

660910 XD975969

660911 XD970573

660914 XD963582

660916 XD962605

660917 XD962600

660919 XD976565

660921 RR999999

660927 XD974594

661001 YD241598

661010 YD242607

661015 YD148604

661017 YD242607

661019 YD148604

661022 YD175615

661025 YD148604

661030 YD242607

661101 YD885132

661102 YD850210

661201 YD885132

661204 YD401399

661210 YD885132

661215 YD750230

670214

- Last location for 1st unit (must be blank).

BETA COMPANY, 3RD BAR

660902 XD986593

660906 YD244597

660910 XD975969

660911 XD970573

660914 XD963582

660916 XD962605

660917 XD962600

660919 XD976565

660921 RR999999

660927 XD974594

661001 YD241598

661010 YD242607

661015 YD148604

661215

- Last location for 2nd unit (must be blank).

*This file 05 is set up for two units using the same "proximity criteria" (time intervals and distances).

1st line - The "2" indicates 2 units being processed.

The "1" indicates the "proximity criteria" listed after the first unit will be used for ALL units in this run (no limit on the number of units, but must reformat to read more than 99999 into the program).

2 0

ALPHA COMPANY, 3RD BAR

005 050 100 000

014 042 000

} - Proximity criteria for 1st unit

660901 XD976565

660902 XD986593

660906 YD244597

660910 XD975969

660911 XD970573

660914 XD963582

660916 XD962605

660917 XD962600

660919 XD976565

660921 RR999999

660927 XD974594

661001 YD241598

661010 YD242607

661015 YD148604

661017 YD242607

661019 YD148604

661022 YD175615

661025 YD148604

661030 YD242607

661101 YD885132

661102 YD850210

661201 YD885132

661204 YD401399

661210 YD885132

661215 YD750230

670214

- Blank location ends 1st unit's data.

BETA COMPANY, 3RD BAR

005 050 100 200 300 400

014 042 060 090 120

} - Proximity criteria for 2nd unit

660902 XD986593

660906 YD244597

660910 XD975969

660911 XD970573

660914 XD963582

660916 XD962605

660917 XD962600

660919 XD976565

660921 RR999999

660927 XD974594

661001 YD241598

661010 YD242607

661015 YD148604

661215

*This file 05 is set up for two units with different proximity criteria.

1st line - The "2" indicates two units.

The "0" indicates proximity criteria will follow every unit name in this run. The program cannot switch modes of operation within a run, i.e., either ALL units are followed by proximity criteria or only the 1st has proximity criteria which will then be used for all units.

FILE: HOPP PATHS P1			CMS VERSION 3.3 28 JULY 1976						
ID NUM	DATE	UTM END POINTS	NDATE	X1	Y1	X2	Y2	Length	
1	650802	AS890255 AS940140	1	434.4	725.5	432.6	714.0	12.0	
2	650804	AS925205 AS970065	3	438.0	720.5	442.8	706.5	14.8	
3	650806	BS290320 BS275298	5	474.2	732.0	472.8	729.9	3.6	
4	650807	YT030110 YT110060	6	302.0	311.0	311.0	306.0	5.3	
5	650815	YD350155 YD450150	14	335.0	915.5	345.0	915.0	10.0	
6	650815	BS265290 BS251255	14	471.8	729.0	470.5	725.5	3.7	
7	650815	BS251255 BS271263	14	470.5	725.5	472.4	726.8	2.3	
8	650815	BS271263 BS258248	14	472.4	726.9	471.2	724.9	2.3	
9	650817	YD195131 YD140240	16	319.5	913.1	314.0	924.0	12.2	
10	650818	BS310340 BS270250	17	476.1	734.0	472.4	725.0	9.7	
11	650818	BS270330 BS250280	17	472.2	733.0	471.3	729.0	5.1	
12	650819	YD222193 YD194203	18	322.2	919.3	319.4	920.8	3.2	
13	650819	YD151229 YD150250	18	316.1	922.9	315.0	925.0	2.4	
14	650819	YD150250 YD175241	18	315.0	925.0	317.5	924.1	2.7	
15	650821	YD170110 YD250190	20	317.0	911.0	325.0	918.0	10.6	
16	650821	YD250190 YD170270	20	325.0	918.0	317.0	927.0	12.0	
17	650821	YD170270 YD100210	20	317.0	927.0	310.0	921.0	9.2	
18	650822	YC870720 ZC000835	21	337.0	872.0	400.0	883.5	17.4	
19	650822	ZC000835 YC940860	21	400.0	883.5	394.0	885.0	6.5	
20	650822	YC940860 YC880850	21	394.0	886.0	338.0	885.0	6.1	
21	650822	YC880850 YC855903	21	338.0	885.0	385.5	890.3	5.9	
22	650822	YC855903 YC770820	21	385.5	890.3	377.0	882.0	11.9	
23	650823	YC870720 ZC000835	22	337.0	872.0	400.0	883.5	17.4	
24	650823	ZC000835 YC940860	22	400.0	883.5	394.0	886.0	6.5	
25	650823	YC940860 YC880850	22	394.0	886.0	338.0	885.0	6.1	
26	650823	YC880850 YC855903	22	338.0	885.0	385.5	890.3	5.9	
27	650823	YC855903 YC770820	22	385.5	890.3	377.0	882.0	11.9	
28	650824	YC700800 YC950850	23	379.0	880.0	395.0	885.0	16.8	
29	650824	YC600800 YC710890	23	369.0	889.0	371.0	889.0	11.0	
30	650825	YC710725 YC700770	24	371.0	872.5	370.0	877.0	4.6	
31	650826	YD330180 YD420160	25	333.0	918.0	342.0	916.0	9.2	
32	650828	BP700900 BP750877	27	521.2	490.0	526.3	487.7	5.6	
33	650829	BQ510122 BQ435162	28	501.7	512.2	494.1	516.2	8.6	
34	650830	BQ435162 BQ510122	29	494.1	516.2	501.7	512.2	8.6	
35	650903	YD095240 YD090330	33	309.5	924.0	308.0	933.0	9.1	
36	650906	YD100320	36	310.0	932.0				
37	650906	BR570450 BR625650	36	504.4	645.0	509.4	665.0	20.6	
38	650907	YD270100 YD365025	37	327.0	910.0	336.5	902.5	12.1	
39	650907	BR570450 BR625650	37	504.4	645.0	509.4	665.0	20.6	
40	650908	YC630860	P 38	368.0	886.0				
41	650909	YD385000	P 39	338.5	900.0				
42	650910	YD385000	P 40	338.5	900.0				
43	650911	YC520815	P 41	352.0	881.5				
44	650912	YC495835	P 42	349.5	883.5				
45	650913	YD210300 YD270330	43	321.0	930.0	327.0	933.0	6.7	
46	650917	YC402981	P 47	340.2	898.1				
47	650917	YB940520	P 47	394.0	752.0				
48	650919	ZR065580	P 49	406.5	758.0				
49	650921	YD158400	P 51	315.8	940.0				
50	650923	BR673855	P 53	514.2	685.5				
51	650924	BR684720	P 54	515.1	672.0				
52	650924	XT400640	P 54	240.0	364.0				
53	650925	BR800660	P 55	526.8	666.0				
54	650925	XT100755	P 55	210.0	375.5				
55	650926	BR600700	P 56	506.7	670.0				

P ← Flag for point sprayings.

Printout info only - - - Data needed for calculations - - -

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C *** HERBICIDE ORANGE PROXIMITY PROGRAM *** 28 MARCH 1980 **HOP000
C RW CHAPMAN ** DCA-CCTC-C312, WASHINGTON, DC 20301 ** 202-697-1731HOP000
C HOP000
C THE PURPOSE OF THIS PROGRAM IS TO DETERMINE TIME INTERVALS (CALLEDHOP000
C 'PROXIMITY PERIODS') FOR WHICH A UNIT (OR INDIVIDUAL) WAS IN PROX-HOP000
C IMITY TO THE FLIGHT PATH (OR POINT) OF A HERBICIDE ORANGE MISSION HOP000
C HOP000
C MATRICES AND FILES ARE DESCRIBED IN THE PROGRAM HOP000
C HOP000
C COMMON ULOC(2,2167), NAME(16), ICRIT(6), DCRIT(6), F(4,6625), IP(6625) HOP000
C INTEGER IDATE(3), LOC(4), UNITS, PCRIT, JDATE(3) HOP000
C DATA IB/' '/, IR/'R'/ HOP000
C DO 100 I=1,6 HOP000
C DCRIT(I)=0.0 HOP000
C 100 ICRIT(I)=000 HOP000
C HOP000
C FILE 05 - USER INPUT OF RUN PARAMETERS AND UNIT DATA HOP000
C HOP000
C UNITS, PCRIT HOP000
C UNITS = NUMBER OF UNITS TO BE PROCESSED HOP000
C PCRIT = FLAG TO PERMIT DIFFERENT 'CRITERIA' FOR EACH UNIT HOP000
C (=0) DCRIT & ICRIT MUST BE ENTERED FOR EACH UNIT HOP000
C (=1) CRITERIA FOR FIRST UNIT WILL BE USED FOR ALL UNITS HOP000
C NOTE - MODES CANNOT BE MIXED HOP000
C HOP000
C NAME - UNIT DESIGNATION (UP TO 64 CHARACTERS) HOP000
C HOP000
C DCRIT - DISTANCE CRITERIA (IN TENTHS OF KILOMETERS) HOP000
C UP TO 6 VALUES MAY BE PROCESSED - A ZERO VALUE ENDS THE LOOP HOP000
C HOP000
C ICRIT - SEARCH INTERVAL (IN DAYS) HOP000
C UP TO 6 VALUES MAY BE PROCESSED - A ZERO VALUE ENDS THE LOOP HOP000
C HOP000
C 'PROXIMITY CRITERIA' IS THE COMBINATION OF A DCRIT & AN ICRIT HOP000
C HOP000
C READ(05,901) UNITS, PCRIT HOP000
C 901 FORMAT(2I5) HOP000
C DO 200 NU=1, UNITS HOP000
C ND2=0 HOP000
C READ(05,902) NAME HOP000
C 902 FORMAT(16A4) HOP000
C WRITE(06,903) NAME HOP000
C 903 FORMAT(' COMMENTS FOR ',16A4) HOP000
C HOP000
C FILE 06 - COMMENTS & ERROR MESSAGES HOP000
C HOP000
C IF (PCRIT-1) 300,200,400 HOP000
C 200 PCRIT=2 HOP000
C 300 READ(05,904) DCRIT HOP000
C 904 FORMAT(6F5.1) HOP000
C READ(05,905) ICRIT HOP000
C 905 FORMAT(6I5) HOP000
C 400 READ(05,906) JDATE, LOC HOP000
C 906 FORMAT(4X,3I2,2X,2A1,2I3) HOP000

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```

C      JDATE,LOC                                HOP0056
C      IDATE,LOC                                HOP0057
C      JDATE = DATE UNIT ARRIVED AT FIRST 'LOC' (LOCATION)          HOP0058
C      IDATE = DATE UNIT MOVED TO A NEW 'LOC' - THE PROGRAM WILL CON- HOP0059
C      sider the unit to be located at the first 'LOC' from JDATE UNTIL HOP0060
C      THE DAY BEFORE IDATE AND THEN SWITCH TO THE NEW 'LOC' -- THIS HOP0061
C      FEATURE ALLOWS UNIT DATE/LOCATIONS TO BE SPECIFIED OVER A LONG HOP0062
C      TIME INTERVAL, BUT ONLY REQUIRES ENTRIES FOR CHANGES IN LOCATION HOP0063
C      - THE DISADVANTAGE IS THAT ONLY ONE LOCATION PER DAY CAN BE CON- HOP0064
C      sidered      NOTE - DATES MUST BE ENTERED IN ASCENDING ORDER HOP0065
C      FOR EACH UNIT, THE DAY AFTER EXITING RVN AND A BLANK LOCATION HOP0066
C      MUST BE THE LAST ENTRY - FOR SHORT PERIODS OUT OF COUNTRY, SUCH HOP0067
C      AS R&R, ENTER THE LOCATION 'RR999999' WITH THE EXIT DATE, RE- HOP0068
C      ENTRY DATE & LOCATION WOULD BE THE NEXT LINE                HOP0069
C
C      DO 450 I=1,3
C      450 IDATE(I)=JDATE(I)
C      WRITE(12,907)
C      907 FORMAT('1',79('*'))
C
C      FILE 12 - HOPP REPORT (PROGRAM OUTPUT)
C
C      WRITE(12,908)
C      908 FORMAT(1X)
C      WRITE(12,909) NAME
C      909 FORMAT(' HOPP REPORT ON ',16A4)
C      WRITE(09,909) NAME
C
C      FILE 09 - CONSOLE OUTPUT (TO MONITOR RUNNING PROGRAM)
C
C      CALL NDATE(JDATE,ND1)
C
C      NDATE - CONVERTS YR/MN/DA DATE INTO A SEQUENTIAL NUMBER
C
C      CALL XYCORD(LOC,X1,Y1)
C
C      XYCORD - CONVERTS UTM COORDINATE LOCATION INTO X,Y COORDINATES
C
C      IF(ND1.LT.1) GO TO 1200
C      475 IF(ND1.GE.2167) GO TO 1700
C      N=ND1
C      ULOC(1,N)=X1
C      ULOC(2,N)=Y1
C
C      ULOC(I,N) - UNIT LOCATION ON DAY N
C      X COORD (I=1), Y COORD (I=2)
C      ENTRIES FOR N=ND1,ND2 WHERE ND1 = FIRST DAY IN COUNTRY
C      ND2 = LAST DAY IN COUNTRY
C
C      500 READ(05,906,END=1100) IDATE,LOC
C      CALL NDATE(IDATE,ND2)
C      IF(LOC(1).EQ.IB .OR. LOC(1).EQ.IR) GO TO 550
C      CALL XYCORD(LOC,X2,Y2)
C      550 IF(ND2.LE.N) GO TO 1600
C      600 N=N+1

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```
650 IF (N.GE.2167) GO TO 1800
   IF (ND2.EQ.N) GO TO 800
C
C   THIS LOOP FILLS IN THE DAYS BETWEEN DATE ENTRIES
C   WHEN THE NEXT DATE (ND2) IS REACHED, IT KICKS OUT
C
700 ULOC (1,N)=X1
   ULOC (2,N)=Y1
   GO TO 600
C
800 IF (LOC (1).EQ.IP) GO TO 900
   IF (LOC (1).EQ.IE) GO TO 1000
   ULOC (1,N)=X2
   ULOC (2,N)=Y2
C
C   INSERT NEW LOCATION SINCE NEXT DATE HAS BEEN REACHED
C   MAKE NEW LOCATION THE OLD LOCATION AND THEN SET A NEW 'NEW' LOC
C
   X1=X2
   Y1=Y2
   GO TO 500
C
900 X1=9999.
   Y1=9999.
C
C   FOR OUT OF COUNTRY - THESE LOCATION WILL BE BEYOND ANY REASONABLE
C   DISTANCE CRITERIA
C
IRR=10000*IDATE (1)+100*IDATE (2)+IDATE (3)
READ (05,906) IDATE,LOC
C
C   GET REENTRY DATE FOR FILE 06 COMMENT BEFORE REJOINING MAIN
C
CALL NDATE (IDATE,ND2)
CALL XCORD (LOC,X2,Y2)
JRR=ND2-1
CALL DATE (JRR)
WRITE (06,911) IRR,JRR
911 FORMAT (' OUT OF COUNTRY FROM ',I7,' TO ',I7)
   N=N-1
   GO TO 550
C
1000 ULOC (1,N)=Y1
   ULOC (2,N)=Y1
C
C   ALL DATA FOR THIS UNIT HAS BEEN ENTERED
C
1050 WRITE (12,912) JDATE, IDATE
   912 FORMAT (3X, 'START DATE =',I3,1H/,I2,1H/,I2,' LAST DATE =',I3,1H/,
1I2,1H/,I2)
   WRITE (09,912) JDATE, IDATE
   WRITE (12,908)
   GO TO 1900
C
1100 WRITE (06,913)
```

```

913 FORMAT(' LAST FILE5 RECORD DOES NOT CONTAIN BLANK LOCATION')      HOP01
C                                                                           HOP01
C IMPROPER LAST ENTRY - IT WILL BE CONSIDERED THE LAST DAY IN        HOP01
C COUNTRY - THE LOCATION LISTED WILL APPEAR ONLY ON THAT DAY          HOP01
C                                                                           HOP01
GO TO 1050                                                                HOP01
C                                                                           HOP01
1200 WRITE(06,914)                                                       HOP01
914 FORMAT(9H 65/08/02,' = DATE OF FIRST SPRAY MISSION. EARLY UNIT    HOP01
DATES WILL NOT BE CONSIDERED.')                                          HOP01
C                                                                           HOP01
C WHEN EARLY UNIT DATES ARE LISTED, THE PROGRAM LOOKS FOR THE FIRST   HOP01
C NON-EARLY DATE WHILE HOLDING THE IMMEDIATELY PRECEDING 'LOC'       HOP01
C WHICH WILL BE USED AS THE UNIT LOC ON 65/03/02, THE FIRST MISSION   HOP01
C                                                                           HOP01
ND1=1                                                                      HOP01
N=1                                                                          HOP01
1300 ULOC(1,1)=X1                                                         HOP01
      ULOC(2,1)=Y1                                                         HOP01
      READ(05,906,END=1500) IDATE,LOC                                     HOP01
      CALL NDATE(IDATE,ND2)                                               HOP01
      IF (LOC(1).EQ.I3 .OR. LOC(1).EQ.IR) GO TO 1400                    HOP01
      CALL XYCOORD(LOC,K2,Y2)                                             HOP01
      IF(ND2.GT.1) GO TO 600                                              HOP01
      X1=Y2                                                                HOP01
      Y1=Y2                                                                HOP01
      GO TO 1300                                                           HOP01
C                                                                           HOP01
1400 IF (ND2.GT.1) GO TO 600                                              HOP01
      IF (LOC(1).EQ.I3) GO TO 1500                                       HOP01
      X1=9999.                                                            HOP01
      Y1=9999.                                                            HOP01
      GO TO 1300                                                           HOP01
C                                                                           HOP01
1500 WRITE(12,908)                                                       HOP02
      WRITE(12,915) IDATE                                                 HOP02
915 FORMAT(2X,I2,1H/,I2,1H/,I2,' = LAST UNIT DATE -- PRECEEDS FIRST  HOP02
1RAY MISSION')                                                           HOP02
C                                                                           HOP02
C ALL UNIT DATES WERE BEFORE THE SPRAYING                              HOP02
C                                                                           HOP02
GO TO 2000                                                                HOP02
C                                                                           HOP02
1600 WRITE(12,909)                                                       HOP02
      WRITE(12,919)                                                       HOP02
919 FORMAT(3X,'UNIT DATES ARE NOT IN ASCENDING ORDER')                HOP02
      GO TO 2000                                                           HOP02
C                                                                           HOP02
1700 WRITE(12,908)                                                       HOP02
      WRITE(12,915) JDATE                                                HOP02
916 FORMAT(2X,I2,1H/,I2,1H/,I2,' = FIRST UNIT DATE -- MORE THAN ONE  HOP02
1AR AFTER LAST SPRAY MISSION -- NO CALCULATIONS MADE')                 HOP02
C                                                                           HOP02
C THE ONE YEAR CUT OFF CAN BE EXTENDED BY INCFASING THE 2167 IN THE  HOP02
C MATRIX ULOC(2,2167), AT ADDRESSES 475 AND 650 AND IN TIMDIS       HOP02

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C
1750 IF (LOC(1).EQ.IB) GO TO 2000
      READ (05,918) LOC(1)
      GO TO 1750
C
1800 WRITE (06,917)
      917 FORMAT (9H 71/07/07, ' = ONE YEAR AFTER LAST SPRAY MISSION AND IS THE
1E LAST UNIT DATE FOR WHICH CALCULATIONS WERE MADE')
      ND2=2167
C
      SEE LAST COMMENTS
C
1850 IF (LOC(1).EQ.IB) GO TO 1900
      READ (05,918) LOC(1)
      918 FORMAT (12X,A1)
      GO TO 1850
C
1900 CALL FINDIS (ND1,ND2)
2000 CONTINUE
      STOP
      END
      SUBROUTINE XYZORD (IN,X,Y)
C
      IN(4) - UTM COORDINATES IN RVN 'AIIIIII' READ AS (2A1,2I3)
      X,Y - RECTANGULAR COORDINATES WITH ORIGIN AT 'VQ000000'
C
      DIMENSION IN(4),IX(6),IY(10),JX(3),JY(8)
      DIMENSION NIX(6),NIY(10),NJX(3),NJY(8)
      DATA IX/'U','V','W','X','Y','Z',IY/'Q','R','S','T','U','V','W','X','Y',
1,'Z',JX/'A','B','C',JY/'D','E','F','G','H','I','J',
      DATA NIX/-1000,0,1000,2000,3000,4000/,NIY/0,1000,2000,3000,4000,5000,6000,7000,8000,9000/,
100,6000,7000,8000,9000/,NJX/3635,4635,5635/,NJY/2000,3000,4000,5000,6000,7000,8000,9000/
C
      CONVERSION TO RECTANGULAR COORDINATES IS COMPLICATED BY THE SPLIT
MAP PROJECTIONS THAT COVER RVN - IX() & JX() DETERMINE WHICH SIDE
THE POINT IS ON AND ESTABLISH THE HORIZONTAL DISTANCE TO THE UTM
GRID SQUARE - IY() OR JY() CAN THEN BE USED TO GET THE VERTICAL
DISTANCE - VALID ONLY FOR SOUTH VIETNAM - SOME DISTORTION IS
INTRODUCED FOR POINTS IN THE RIGHT PROJECTION, SEE COMMENT BELOW
C
      DO 10 I=1,6
      II=I
      IF (IN(1).EQ.IX(I)) GO TO 20
10 CONTINUE
      GO TO 50
C
20 X=FLOAT(NIX(II)+IN(3))/10.
      DO 30 I=1,10
      II=I
      IF (IN(2).EQ.IY(I)) GO TO 40
30 CONTINUE
      GO TO 100
C
40 Y=FLOAT(NIY(II)+IN(4))/10.

```

```

RETURN
50 DO 60 I=1,3
   II=I
   IF (IN(2).EQ.JY(I)) GO TO 70
60 CONTINUE
   GO TO 100

70 ITY=NJY(II)+IN(4)
   Y=FLOAT(ITY)/10.
   DO 80 I=1,3
   II=I
   IF (IN(1).EQ.JX(I)) GO TO 90
80 CONTINUE
   GO TO 100

GRID SQUARES BORDERING THE PROJECTION SLIT ARE TRAPEZOIDAL
THE EQUATION BELOW IS A ROUGH ADJUSTMENT FOR THE HORIZONTAL VALUES
MAGNITUDE OF THE VERTICAL DISTORTION NEAR THE SLIT IS RELATIVELY
SMALL AND HAS NOT BEEN ADJUSTED - THIS SUBROUTINE WAS USED ON THE
FLIGHT PATH LOCATIONS ALSO - THIS TECHNIQUE COULD NOT WITHSTAND
RIGOROUS SCRUTINY BUT INTENT IS TO DETERMINE RELATIVE LOCATIONS
AND NOT ABSOLUTE LOCATIONS - FOR 'DISTANCE CRITERIA' LESS THAN 20
KM, THE MAXIMUM ERROR SHOULD BE 0.2 KM - CONVERSELY, THE MINIMUM
DCRIT USED SHOULD BE 0.5 KM

90 X=FLOAT(MJX(II)+IN(3)-((ITY+20)/40))/10.
   RETURN
100 WRITE(09,914) IN
914 FORMAT(' INVALID UTM COORD FOR XYCORD CALC ',2A1,2I5)
   WRITE(06,914) IN
   X=9999.
   Y=9999.
   RETURN
END
SUBROUTINE TIMDIS(ND1,ND2)

THIS DETERMINES PROXIMITY PERIODS FOR SPECIFIED TIME AND DISTANCE
CRITERIA - EFFECTIVE FLIGHT PATHS ARE IDENTIFIED & LISTED

COMMON ULOC(2,2167),NAME(16),ICRIT(6),DCRIT(6),P(4,6625),IP(6625)
DIMENSION IDAY(2167),LOCP(6625),IPATH(5,6625),NDAY(2,300)
INTEGER PDATE(6625),PLD(1801)
DATA NTIME/0/,N/0/
NL=6
IF (NTIME.GT.0) GO TO 200
NTIME=1
DO 100 J=1,6625
100 READ(10,915) (IPATH(I,J),I=1,5),JP(J),PDATE(J),(2(I,J),I=1,4)
915 FORMAT(9X,16,2(1X,2A4),1X,A1,16,4(1X,F6.1))

FILE 10 - FLIGHT PATH DATA FOR HERBICIDE ORANGE MISSIONS
   IPATH(I,J) - DATE & UTM LOCATION OF PATH (OUTPUT FORM)
               (NOT USED FOR CALCULATIONS)
   IP(J)      - FLAG FOR POINT SPRAY MISSIONS
   PDATE(J)   - SEQUENTIAL DATE OF MISSION

```

HOP0276
HOP0277
HOP0278
HOP0279
HOP0280
HOP0281
HOP0282
HOP0283
HOP0284
HOP0285
HOP0286
HOP0287
HOP0288
HOP0289
HOP0290
HOP0291
HOP0292
HOP0293
HOP0294
HOP0295
HOP0296
HOP0297
HOP0298
HOP0299
HOP0300
HOP0301
HOP0302
HOP0303
HOP0304
HOP0305
HOP0306
HOP0307
HOP0308
HOP0309
HOP0310
HOP0311
HOP0312
HOP0313
HOP0314
HOP0315
HOP0316
HOP0317
HOP0318
HOP0319
HOP0320
HOP0321
HOP0322
HOP0323
HOP0324
HOP0325
HOP0326
HOP0327
HOP0328
HOP0329
HOP0330

P(I,J) - X1,Y1,X2,Y2 COORDINATES OF FLIGHT PATH LEGS

HOP0331
HOP0332
HOP0333
HOP0334
HOP0335
HOP0336
HOP0337
HOP0338
HOP0339
HOP0340
HOP0341
HOP0342
HOP0343
HOP0344
HOP0345
HOP0346
HOP0347
HOP0348
HOP0349
HOP0350
HOP0351
HOP0352
HOP0353
HOP0354
HOP0355
HOP0356
HOP0357
HOP0358
HOP0359
HOP0360
HOP0361
HOP0362
HOP0363
HOP0364
HOP0365
HOP0366
HOP0367
HOP0368
HOP0369
HOP0370
HOP0371
HOP0372
HOP0373
HOP0374
HOP0375
HOP0376
HOP0377
HOP0378
HOP0379
HOP0380
HOP0381
HOP0382
HOP0383
HOP0384
HOP0385

READ(10,916) PLD

916 FORMAT(16I5)

PLD(I) - LOCATES FIRST MISSION ON OR AFTER THE ITH DAY

WRITE(09,917)

917 FORMAT(' PATH LOCATIONS FILED')

200 DO 2100 ID=1,6

IF(DCRIT(ID).EQ.0) GO TO 2200

DO 2000 IC=1,6

IF(ICRIT(IC).EQ.0) GO TO 2100

WRITE(09,918) DCRIT(ID),ICRIT(IC)

918 FORMAT(' DCRIT =',F5.1,' ICRIT =',I3)

INITIALIZE

DO 300 I=1,6625

300 LOCP(I)=0

DO 400 I=1,2167

400 IDAY(I)=0

N=ND1-1

ND1 - FIRST UNIT DATE

500 N=N+1

NQ=N-ICRIT(IC)+1

NQ - FIRST DAY IN THE SEARCH INTERVAL WHICH WILL COVER THE UNIT DATE AND THE PRECEDING N-1 DAYS WHERE N=ICRIT VALUE

IF(NQ.LT.1) GO TO 1800

IF(NQ.GT.1801) GO TO 1900

IPL=PLD(NQ)-1

IPL - THE FIRST MISSION OCCURRING IN THE SEARCH INTERVAL

600 IPL=IPL+1

IF(IPL.GT.6625) GO TO 700

IF(PDATE(IPL).GT.N) GO TO 700

SEARCH INTERVAL STOPS ON THE UNIT DATE

CALL DIST(N,IPL,D)

IF(D.GT.DCRIT(ID)) GO TO 600

IDAY(N) - COVERS THE PERIOD FROM THE FIRST MISSION TILL ONE YEAR AFTER THE LAST MISSION - WHEN THE PROXIMITY CRITERIA IS MET, THE APPROPRIATE DATE IS FLAGGED

LOCP(I) - MARK IDENTITY(IPL) OF MISSIONS EFFECTING THE UNIT

IDAY(N)=1

LOCP(IPL)=1

GO TO 600

```

C
700 IF (N.LE.ND2) GO TO 500
C
C ND2 - LAST UNIT DATE
C
800 IGO=0
NP=0
C
C DETERMINE PROXIMITY PERIODS, PERIODS WITH IDAY FLAGGED
C NP - THE NUMBER OF PERIOD
C NL - NUMBER OF PRINTED LINES ON HOPP REPORT
C
DO 1000 I=ND1,ND2
IF (IDAY(I).EQ.0) GO TO 900
IF (IGO.EQ.1) GO TO 1000
IGO=1
ISTART=I
GO TO 1000
C
900 IF (IGO.EQ.0) GO TO 1000
IGO=0
ISTOP=I-1
CALL DATE(ISTART)
CALL DATE(ISTOP)
NP=NP+1
NDAY (1,NP)=ISTART
NDAY (2,NP)=ISTOP
C
C NDAY (I,J) - FILE OF PROXIMITY PERIODS FOR PRINTOUT
C
1000 CONTINUE
IF (ABS (FLOAT (NL-53)) .LT. 7.1) GO TO 1700
C
C START NEW PRINTOUT PAGE WHEN NEAR THE BOTTOM OF A PAGE
C
1100 NL=NL+3
WRITE (12,919)
919 FORMAT (1X)
WRITE (12,920) DCRT (ID), ICPIT (IC)
920 FORMAT (1X,10 ('*'), ' DISTANCE CRITERIA =',F5.1,' KM SEARCH INTER'
1VAL =',I3,' DAYS ',10 ('*'))
WRITE (12,919)
IF (NP.EQ.0) GO TO 1600
C
C WHEN NP=0, THERE WERE NO PROXIMITY PERIODS
C
NL=NL+5+ (NP/5-1)
WRITE (12,922)
922 FORMAT (11X,10 ('- '), ' PROXIMITY PERIODS ',10 (' -'))
WRITE (12,923) ((NDAY (I,J), I=1,2), J=1,NP)
923 FORMAT (5 (3X,I6,'-',I6))
WRITE (12,919)
WRITE (12,924)
924 FORMAT (11X,9 ('- '), 'EFFECTIVE FLIGHT PATHS',9 (' -'))
I1=0

```

HOP030
HOP031
HOP032
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HOP099
HOP100

	I2=0	HOP044
C		HOP044
C	DETERMINE MARKED FLIGHT PATHS	HOP044
C		HOP044
	DO 1400 I=1,6625	HOP044
	IF (LOCP(I).EQ.0) GO TO 1400	HOP044
	IF (I1.GT.0) GO TO 1200	HOP044
	I1=I	HOP044
	GO TO 1400	HOP044
C		HOP045
	1200 IF (I2.GT.0) GO TO 1300	HOP045
	I2=I	HOP045
	GO TO 1400	HOP045
C		HOP046
C	WRITE THEM ONE IN GROUPS OF THREE (SAVES LINES)	HOP046
C		HOP046
	1300 WRITE (12,925) (IPATH(J,I1),J=1,5), (IPATH(K,I2),K=1,5), (IPATH(I,I1),	HOP046
	I=1,5)	HOP046
	925 FORMAT(3(1X,I6,1X,2A4,'-',2A4,1X),2X)	HOP046
	NL=NL+1	HOP046
	I1=0	HOP046
	I2=0	HOP046
	1400 CONTINUE	HOP046
	IF (I1.EQ.0) GO TO 2000	HOP046
C		HOP046
C	PICK UP ANY LEFT OVER FROM THE GROUP OF THREE WRITING	HOP046
C		HOP046
	NL=NL+1	HOP046
	IF (I2.EQ.0) GO TO 1500	HOP046
C		HOP047
C	TWO LEFT OVER	HOP047
C		HOP047
	WRITE(12,926) (IPATH(J,I1),J=1,5), (IPATH(K,I2),K=1,5)	HOP047
	926 FORMAT(2(1X,I6,1X,2A4,'-',2A4,1X))	HOP047
	GO TO 2000	HOP047
C		HOP047
C	ONE LEFT OVER	HOP047
C		HOP047
	1500 WRITE(12,927) (IPATH(J,I1),J=1,5)	HOP047
	927 FORMAT(1X,I6,1X,2A4,'-',2A4)	HOP047
	GO TO 2000	HOP047
C		HOP048
	1600 WRITE(12,928)	HOP048
	928 FORMAT(11X,5(' '), 'NO FLIGHTS MET THIS PROXIMITY CRITERIA',5(' -	HOP048
	1'))	HOP048
	NL=NL+2	HOP048
	GO TO 2000	HOP048
C		HOP049
C	TOP OF CONTINUATION PAGE	HOP049
C		HOP049
	1700 WRITE(12,929)	HOP049
	929 FORMAT('1',73('*'))	HOP049
	WRITE(12,919)	HOP049
	WRITE(12,930) NAME	HOP049
	930 FORMAT(' MORE DATA ON ',16A4)	HOP049

WRITE (12,919)
NL=4
GO TO 1100

HOP048
HOP049
HOP049
HOP049

C
C
C
C

SEARCH INTERVAL EXTENDED INTO NEGATIVE TIME, I.E., BEFORE THE
FIRST MISSION - START WITH THE FIRST MISSION

HOP050
HOP050
HOP050

1800 IPL=0
GO TO 600

HOP050
HOP050
HOP050

C
C
C

UNIT DATE (N) IS BEYOND RANGE OF MISSION DATA

HOP050
HOP050

1900 CALL DATE (N)

WRITE (06,932) N, ICRIT (IC)

932 FORMAT (I7, ' MINUS', I4, ' DAYS -IS GREATER THAN LAST FLIGHT')

GO TO 800

HOP050
HOP050
HOP050
HOP050
HOP050

C

2000 WRITE (12,919)

2100 CONTINUE

2200 RETURN

END

SUBROUTINE DIST (NU, NP, D)

HOP051
HOP051
HOP051
HOP051
HOP051
HOP051
HOP051

C
C
C
C

CALCULATES DISTANCE (D) FROM UNIT LOCATION, ULOC (1, NU) TO THE PATH
P (1, NP) WITH NU=UNIT DATE AND NP=PATH IDENTITY

HOP051
HOP051
HOP052

COMMON ULOC (2, 2167), NAME (16), ICRIT (6), DCRIT (6), P (4, 6625), IP (6625)
DATA IB/ ' ' /

HOP052
HOP052

C
C
C

X1, Y1 - UNIT LOCATION

HOP052
HOP052
HOP052

X1=ULOC (1, NU)

Y1=ULOC (2, NU)

HOP052
HOP052

C
C
C

X2, Y2 - ONE END OF THE FLIGHT PATH

HOP052
HOP052
HOP052

X2=P (1, NP)

Y2=P (2, NP)

X12=X1-X2

Y12=Y1-Y2

IF (IP (NP) .EQ. IB) GO TO 10

HOP052
HOP052
HOP052
HOP052
HOP052

C
C
C

IP (NP)='P' FOR POINTS (GO TO 10 IS FOR SEGMENTS)

HOP052
HOP052
HOP052

D = X12*X12 + Y12*Y12

D = SQRT (D)

HOP052
HOP052

C
C
C

PYTHAGORAS

HOP052
HOP052
HOP052

RETURN

HOP052
HOP052

C
C
C
C

X3, Y3 - THE OTHER END OF THE PATH (NOW WORKING WITH A LINE
SEGMENT, A LEG OF A MISSION)

HOP052
HOP052
HOP052

10 X3=P (3, NP)

HOP052

```

Y3=P(4,NF)
X13=X1-X3
X23=X2-X3
Y13=Y1-Y3
Y23=Y2-Y3
X23SQ=X23*X23
Y23SQ=Y23*Y23
DENOM=X23SQ+Y23SQ

```

HOP055
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HOP099
HOP100

X, Y - THE INTERCEPT OF A PERPENDICULAR LINE FROM THE UNIT LOCATION
TO THE LINE OF THE FLIGHT PATH (THROUGH END POINTS OF LEG)

```

X = ( X3*Y23SQ + X1*X23SQ + Y13*Y23*X23 ) / DENOM
Y = ( Y3*X23SQ + Y1*Y23SQ + X13*X23*Y23 ) / DENOM

```

DETERMINE LOCATION OF INTERCEPT WITH RESPECT TO THE END POINTS,
I.E., IS THE INTERCEPT ON THE LEG OR BEYOND THE END POINTS

```

X4=X2
X5=X3
IF (X4.GE.X5) GO TO 20
X4=X3
X5=X2
20 IF (X4.LT.X) GO TO 40
IF (X5.GT.X) GOTO 40
Y4=Y2
Y5=Y3
IF (Y4.GE.Y5) GO TO 30
Y4=Y3
Y5=Y2
30 IF (Y4.LT.Y) GO TO 40
IF (Y5.GT.Y) GO TO 40

```

INTERCEPT IS ON THE LEG - DISTANCE WILL BE THE PERPENDICULAR DIST
FROM THE UNIT LOCATION TO THE FLIGHT PATH

```

XX1=X-X1
YY1=Y-Y1
D = XX1*XX1 + YY1*YY1
D=SQRT(D)
RETURN

```

INTERCEPT IS BEYOND THE END POINTS - DISTANCE WILL BE THE DISTANCE
FROM THE UNIT LOCATION TO THE NEAREST END POINT

```

40 X13SQ=X13*X13
Y13SQ=Y13*Y13
D1=X13SQ+Y13SQ
X12SQ=X12*X12
Y12SQ=Y12*Y12
D2=X12SQ+Y12SQ
D=D1
IF (D2.LT.D) D=D2
D=SQRT(D)
RETURN

```

HOP051
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HOP199
HOP200

```
END
SUBROUTINE NDATE(ID,IDA)
```

```
COVERT YR/MN/DA DATE INTO A SEQUENTIAL DATE
```

```
DIMENSION ID(3),IM(12)
DATA IM/0,31,59,90,120,151,181,212,243,273,304,334/
IF (ID(1) - 17.65) GO TO 50
IDA=365*(ID(1)-65) + IM (ID(2)) + ID(3) - 213
IF (IDA-942) 40,20,30
```

```
ACCOUNTS FOR LEAP YEAR 29 FEB 68
```

```
20 IF (ID(2) .EQ. 2) GO TO 30
GO TO 40
30 IDA=IDA+1
40 RETURN
50 IDA=-1
RETURN
END
```

```
SUBROUTINE DATE(ID)
```

```
CONVERT A SEQUENTIAL DATE INTO A YR/MN/DA DATE
```

```
DIMENSION IM(12)
DATA IM/334,304,273,243,212,181,151,120,90,59,31,0/
ID=ID+213
IF (ID-942) 30,10,20
```

```
ACCOUNTS FOR LEAP YEAR 29 FEB 68
```

```
10 ID=680229
RETURN
20 ID=ID-1
30 I=ID/365
ID=ID-365*I
I=I+65
DO 40 JJ=1,12
J=JJ
IF (ID.GT.IM(JJ)) GO TO 50
40 CONTINUE
50 K=ID-IM(J)
J=13-J
ID=10000*I + 100*J + K
RETURN
END
```

HOP0604
HOP0605
HOP0606
HOP0607
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