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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 ?"

RW Chapman
DCA-CCTC-C312
Washington, DC 20301
202-697-1731/2439

```
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 ~~XD996599~~

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	439.6	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	3.6	
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	878.1				
47	650917	YB940520	P 47	394.0	752.0				
48	650919	ZR065580	P 49	406.5	753.0				
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 - - -


```

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
C HOP000

```

```

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 HOP0070
450  IDATE(I)=JDATE(I) HOP0071
      WRITE(12,907) HOP0072
907  FORMAT('1',79('*')) HOP0073
C
C      FILE 12 - HOPP REPORT (PROGRAM OUTPUT) HOP0074
C
C      WRITE(12,908) HOP0075
908  FORMAT(1X) HOP0076
      WRITE(12,909) NAME HOP0077
909  FORMAT(' HOPP REPORT ON ',16A4) HOP0078
      WRITE(09,909) NAME HOP0079
C
C      FILE 09 - CONSOLE OUTPUT (TO MONITOR RUNNING PROGRAM) HOP0080
C
C      CALL NDATE(JDATE,ND1) HOP0081
C
C      NDATE - CONVERTS YR/MN/DA DATE INTO A SEQUENTIAL NUMBER HOP0082
C
C      CALL XYCORD(LOC,X1,Y1) HOP0083
C
C      XYCORD - CONVERTS UTM COORDINATE LOCATION INTO X,Y COORDINATES HOP0084
C
C      IF(ND1.LT.1) GO TO 1200 HOP0085
475  IF(ND1.GE.2167) GO TO 1700 HOP0086
      N=ND1 HOP0087
      ULOC(1,N)=X1 HOP0088
      ULOC(2,N)=Y1 HOP0089
C
C      ULOC(I,N) - UNIT LOCATION ON DAY N HOP0090
C      X COORD (I=1), Y COORD (I=2) HOP0091
C      ENTRIES FOR N=ND1,ND2 WHERE ND1 = FIRST DAY IN COUNTRY HOP0092
C      ND2 = LAST DAY IN COUNTRY HOP0093
C
500  READ(05,906,END=1100) IDATE,LOC HOP0094
      CALL NDATE(IDATE,ND2) HOP0095
      IF(LOC(1).EQ.IB .OR. LOC(1).EQ.IR) GO TO 550 HOP0096
      CALL XYCORD(LOC,X2,Y2) HOP0097
550  IF(ND2.LE.N) GO TO 1600 HOP0098
600  N=N+1 HOP0100

```

650 IF (N.GE.2167) GO TO 1800
IF (ND2.EQ.N) GO TO 800

HOP017
HOP018
HOP019

THIS LOOP FILLS IN THE DAYS BETWEEN DATE ENTRIES
WHEN THE NEXT DATE (ND2) IS REACHED, IT KICKS OUT

HOP020
HOP021
HOP022

700 ULOC (1,N)=X1
ULOC (2,N)=Y1
GO TO 600

HOP023
HOP024
HOP025
HOP026

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

HOP027
HOP028
HOP029
HOP030
HOP031

INSERT NEW LOCATION SINCE NEXT DATE HAS BEEN REACHED
MAKE NEW LOCATION THE OLD LOCATION AND THEN SET A NEW 'NEW' LOC

HOP032
HOP033
HOP034

X1=X2
Y1=Y2
GO TO 500

HOP035
HOP036
HOP037
HOP038

900 X1=9999.
Y1=9999.

HOP039
HOP040
HOP041

FOR OUT OF COUNTRY - THESE LOCATION WILL BE BEYOND ANY REASONABLE
DISTANCE CRITERIA

HOP042
HOP043
HOP044

IRR=10000*IDATE (1)+100*IDATE (2)+IDATE (3)
READ (05,906) IDATE,LOC

HOP045
HOP046
HOP047

GET REENTRY DATE FOR FILE 06 COMMENT BEFORE REJOINING MAIN

HOP048
HOP049

CALL NDATE (IDATE,ND2)
CALL XYCORD (LOC,X2,Y2)
JRR=ND2-1
CALL DATE (JRR)
WRITE (06,911) IRR,JRR

HOP050
HOP051
HOP052
HOP053
HOP054
HOP055

911 FORMAT (' OUT OF COUNTRY FROM ',I7,' TO ',I7)
N=N-1
GO TO 550

HOP056
HOP057
HOP058

1000 ULOC (1,N)=Y1
ULOC (2,N)=Y1

HOP059
HOP060
HOP061

ALL DATA FOR THIS UNIT HAS BEEN ENTERED

HOP062
HOP063

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

HOP064
HOP065
HOP066
HOP067
HOP068
HOP069

1100 WRITE (06,913)

HOP070
HOP071

```

C 913 FORMAT(' LAST FILE5 RECORD DOES NOT CONTAIN BLANK LOCATION') 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 GO TO 1050 HOP01
C 1200 WRITE(06,914) HOP01
C 914 FORMAT(9H 65/08/02,' = DATE OF FIRST SPRAY MISSION. EARLY UNIT HOP01
C DATES WILL NOT BE CONSIDERED.') 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 65/08/02, THE FIRST MISSION HOP01
C ND1=1 HOP01
C N=1 HOP01
C 1300 ULOC(1,1)=X1 HOP01
C ULOC(2,1)=Y1 HOP01
C READ(05,906,END=1500) IDATE, LOC HOP01
C CALL NDATE(IDATE,ND2) HOP01
C IF (LOC(1).EQ.I3 .OR. LOC(1).EQ.IR) GO TO 1400 HOP01
C CALL XYCORD(LOC,X2,Y2) HOP01
C IF(ND2.GT. 1) GO TO 600 HOP01
C X1=X2 HOP01
C Y1=Y2 HOP01
C GO TO 1300 HOP01
C 1400 IF (ND2.GT. 1) GO TO 600 HOP01
C IF (LOC(1).EQ.I3) GO TO 1500 HOP01
C X1=9999. HOP01
C Y1=9999. HOP01
C GO TO 1300 HOP01
C 1500 WRITE(12,908) HOP02
C WRITE(12,915) IDATE HOP02
C 915 FORMAT(2X,I2,1H/,I2,1H/,I2,' = LAST UNIT DATE -- PRECEEDS FIRST HOP02
C 1RAY MISSION') HOP02
C ALL UNIT DATES WERE BEFORE THE SPRAYING HOP02
C GO TO 2000 HOP02
C 1600 WRITE(12,908) HOP02
C WRITE(12,919) HOP02
C 919 FORMAT(3X,'UNIT DATES ARE NOT IN ASCENDING ORDER') HOP02
C GO TO 2000 HOP02
C 1700 WRITE(12,908) HOP02
C WRITE(12,915) IDATE HOP02
C 916 FORMAT(2X,I2,1H/,I2,1H/,I2,' = FIRST UNIT DATE -- MORE THAN ONE HOP02
C 1AR AFTER LAST SPRAY MISSION -- NO CALCULATIONS MADE') 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 TINDIS HOP02

```

```

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','X','Y','Z',IY/'Q','R','S','T','U','V','W','X','Y',
1,'Z',JX/'A','B','C',JY/'H','K','L','M','N','O','P','Q','R','S','T','U',
      DATA NIX/-1000,0,1000,2000,3000,4000/,NIY/0,1000,2000,3000,4000,5000,
100,6000,7000,8000,9000/,NJX/3635,4635,5635/,NJY/2000,3000,4000,5000,
20,6000,7000,8000,9000/
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.

```

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HOP0240
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HOP0264
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HOP0266
HOP0267
HOP0268
HOP0269
HOP0270
HOP0271
HOP0272
HOP0273
HOP0274
HOP0275

```

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),NAKE(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

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HOP0279
HOP0280
HOP0281
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HOP0330

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

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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 AFFECTING 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
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```


	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


```

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

```

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```

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

```

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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

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