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The production of non-standard tephigrams on Calcomp.By Pywell,A.

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METEOROLOGICAL OFFICE
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MET.O.15 INTERNAL REPORT

No. 010

The Production of Non - Standard Tephigrams on Calcomp

By

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Cloud Physics Branch (Met.O.15)

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HISTORICAL NOTE .

The program and associated examples in this report are the result of a wish to be able to show data from DROPSONDE descents in tephigram form . During one drop up to 1080 pressure , temperature , and humidity observations are recorded . Obviously with so many data points , plotting by hand would be a time consuming business .

Initially it was thought that existing programs used to plot tephigrams on Calcomp could be utilised . However , to achieve this , the data would need to be arranged into a buffer similar to the one created by the " databank " retrieval LAR10M . This would be a fairly complex task and in the result the plot is still restricted to the standard levels plus 45 special points .

The only option that now seemed open was to draw a background in the same manner as the " standard programs " and devize a specialised plotting routine . The resulting program uses the already existing subroutines DRWTFY , DRWVLS , and XYCRDS . I am responsible for the two remaining subroutines PLTDRP , and PLTIT but many ideas used in their construction have been borrowed from various original Met. O. 12 programs .

THE PROGRAM .

The " main " program is not listed in this note since it has little bearing on the production of the tephigram . It performs a quality control check on the data and passes only the pertinent parameters to the subroutine PLTDRP which acts as a control program during the plotting sequence . The parameters passed to PLTDRP are :- PS Pressure , TS Temperature , TD Dewpoint , JJ the number of points to be plotted , and a title of up to 80 alphanumeric characters .

THE SUBROUTINES :-

1. PLTDRP

This subroutine acts as the " main " of the tephigram plotting sequence . The listing that is given later is specifically constructed for plotting dropsonde data but it would be a simple task to modify the routine for most purposes . Pressure , temperature , and dewpoint arrays are carried into the subroutine as parameters PS , TS , and TD respectively . A title of up to 80 characters is introduced via a common block . The scale determines the size of the plotted background and its value is the same as when the background datasets are created using TEFIBGRD (see later.)

The subroutine performs the following functions :-

(a) Opens a frame of Calcomp film .
(b) Writes a title at the top of the frame .
(c) Moves the beam to a new logical origin .
(d) Draws the lines of the background .
(e) Places numerical values on the above lines .
(f) Increases the beam intensity .
(g) Picks up pressure and temperature values .
(h) Converts the above values to X,Y coordinates .
(i) Plots the pressure against temperature curve .
(j) Repeats (g) , (h) , and (i) with pressure and dewpoint values .
(k) Advances and closes the frame of Calcomp film .

2. DRWTFY

Care should be taken when using this subroutine since there are two different versions , both are held on Met. O. 12 source libraries . The version listed later in this note is designed to be used in conjunction with the program TEFIBGRD , whereas the other is used when standard (CFO and FAX) tephigram backgrounds are drawn using existing datasets . TEFIBGRD is a Met. O. 12 program thats creates two datasets which contain all the necessary in formation to produce a background.

DRWTFY reads from the first of these datasets and then draws all of the lines of the tephigram , whether light , dark , or dashed . Gaps are left at the edge of some lines so that their numerical value can placed in the space

2. DRWTFY cont

by the subroutine DRWVLS .

3. DRWVLS

As with the above subroutine there are two versions in existence , the right one when using " reader " created datasets is listed later in the notes . The subroutine reads from the second dataset created by TEFIBGRD , then places the numerical value of the isolines in the gaps provided when the lines were drawn by DRWTFY .

N.B. If a standard CFO or FAX background is required by the reader he should use the datasets already in existence and obtain from Met. O. 12c listings of the other versions of DRWTFY and DRWVLS . These subroutines used the " define file " method of reading from the datasets , i.e. " direct access ".

4. XYCRDS

This subroutine converts pressure and temperature values to X and Y coordinates with respect to a rectangular system whose origin is the intersection of the 0°C isotherm and the 1000mb isobar .

5. PLTIT

This subroutine draws the dropsonde data in the normal tephigram manner , i.e. a continuous line for the pressure against temperature plot , and a dashed line for the pressure versus dewpoint plot . A check is also made to ensure that the data is within the limits of the background . These bounds would of course have to be changed for each different background used .

\- \- \-

TEPHIGRAM BACKGROUNDS.

The Met O 12 program TEFIBGRD creates two datasets which are subsequently read by the subroutines DRWTFY , and DRWVLS . The subroutine DRWTFY draws all of the lines of the tephigram and DRWVLS places the numerical values on the lines , e.g. 800mb ,-10° C .

TEFIBGRD.

The program is held on-line on M12.CSRCELIB(TEFIBGRD) . The lines making up the background are formed within a quadrilateral area defined by four user supplied points . There is no restriction on the position of the points . By repeated looping within the program several areas may be built up into a reasonably complex shape . If required " boxes " similar to those on the FAX and CFO backgrounds can be developed .

Principal Variables Within Program:-

1. NTFY — Number of loops through program , i.e. the number of quadrilaterals to be developed .

2. J2 — A decision variable which for historical reasons is the reference number of the dataset from which the subroutine DRWTFY reads . The DSN is of the form Mxx.yTFYJ2 , where xx is your branch number , and y is your programming letter .

   K2 — The value of K2 is derived from that of J2 . Like J2 it is the reference number of the dataset from which DRWVLS reads . The DSN is of the form Mxx.yTFYK2 .

   JCL reqd
   ```
   //GO.FTJ2F001 DD DSN=Mxx.yTFYJ2  etc
   //GO.FTK2F001 DD DSN=Mxx.yTFYK2  etc .
   ```

3. SCALE — Tephigram scale , e.g. 0.8 for FAX , 1.0 for CFO .

4. FREQU(5) — The frequency between successive isolines on the background , a line is supressed by having a value of zero . FREQU(1) = Isotherms , FREQU(2) = Dry Adiabats , FREQU(3) = Isobars , FREQU(4) = Mixing Ratios , FREQU(5) = Saturated Adiabats .

5. V — A decision variable , either 0 or -1 . 0 if the four points defining the quadrilateral are to be given in P,T form , and -1 if they are to be in X,Y form .

6. INOTT(4) or INOT(4) — A decision variable , either 0 or 1 . If the appropriate line of the bounding quadrilateral is required , INOTT(n) = 0 . See Fig 2.

7. PNTS(4,2) The X (PNTS(n,1)) and the Y (PNTS(n,2)) coordinates in inches of the four points defining the quadrilateral . The points are with respect to a rectangular coordinate system whose origin is the intersection of the 0° C isotherm and the 1000mb isobar . The positive X axis is rotated 45° clockwise w.r.t. the 0°C isotherm .

8. RECT(4,4) The P (RECT(n,1)) and the T (RECT(n,2)) coordinatesin inches of the four points defining the quadrilateral . P pressure mbs , T temperature °C .

N.B. The program is constructed with the production of standard tephigrams in mind , hence , there are certain restrictions and limitations on its use . The examples that are found later in this note deal mainly with non-standard backgrounds but the method of accessing and using the datasets for the standard (CFO and FAX) backgrounds is also included . Met. O. 12c (Line Drawing and Plotting) should be consulted before attempting the latter .

As stated above there are certain points which need to be adhered to for the best results when using TEFIBGRD . Experience has shown that if the bounding quadrilateral is to be an exact rectangle or square then the four points defining the area should be given in X,Y coordinates . The best way of obtaining these coordinates is to decide on the approximate pressure and temperature limits of the required background and then manually convert these values using the subroutine XYCRDS . See Fig 7 . For points in (X,Y) coordinates V=0 , and in (P,T) coordinates V=-1 . The value of J2 determines whether a box of CFO , or Fax type is drawn .

i.e. $J2 \leqslant 40$ will not generate a box .
$40 < J2 < 60$ will generate a CFO type box .
$J2 \geqslant 60$ will generate a FAX type box .

Fig 3 . shows how J2 , V , and the other main variables within the program are dealt with , giving also the format of the data input read from cards .

The above notes on TEFIBGRD , although not a facsimile , have borrowed heavily from the original notes written by P.DIBBEN . Line Drawing and Plotting hold these notes , and copies of all of the programs and subroutines used .

THE PROGRAM LISTING :- PLTDRP

DRWTFY

DRWVLS

XYCRDS

PLTIT

```
      SUBROUTINE PLTDRP(PS,TS,TD,JJ,LTEFY)
C
C        THIS IS THE 'MAIN' PROGRAM OF THE TEPHIGRAM PLOTTING SEQUENC
C        THE PROGRAM PERFORMS THE FOLLOWING FUNCTIONS -
C        1. WRITES A TITLE AT THE TOP OF THE TEPHIGRAM.
C        2. DRAWS A TEPHIGRAM BACKGROUND - CALL DRWTFY.
C        3. WRITES PRESSURE,TEMP AND VMR VALUES ON THE BACKGROUND,
C           - CALL DRWVLS.
C        4. PICKS UP PRESSURE AND TEMP VALUES AND CONVERTS THEM
C           INTO X-Y CALCOMP COORDINATES - CALL XYCRDS.
C        5. PLOTS THE PRESSURE AND TEMP VALUES - CALL PLTIT.
C        6. REPEATS 4. , AND 5. WITH PRESSURE AND DEWPOINT VALUES.
C
      DIMENSION PS(1080),TD(1080),TS(1080)
      LOGICAL*1 DEWPTS,LTEFY,LLAST
      COMMON/B/TITLE(20)
      SCALE=2.2
C
C        SCALE DEFINES THE SIZE OF THE BKGRND AND RELATED PLOT, 2.2
C        THE TEPHIGRAM FILLS THE FRAME, IF A SMALLER VERSION IS REQD
C        SCALE IS REDUCED AND NEW DATASETS ARE NEEDED TO PLOT THE
C        BACKGROUND. THE DATASETS ARE CREATED USING A MET O 12 PROGRA
C        M12.CSRCELIB(TEFUBGRD) - SEE SEPARATE NOTES IN FOLDER.
C
      DEWPTS=.FALSE.
      CALL OPEN35
      CALL SYMBOL (2.0,16.6,0.3,TITLE,0.0,60)
      CALL CALCMP (11.0,1.0,0,3)
      CALL DRWTFY(44)
      CALL DRWVLS(45)
      LLAST=.FALSE.
      CALL CALCMP (99,99,25,7)
      DO 100 KNT=1,JJ
      P=PS(KNT)
      T=TS(KNT)
      CALL XYCRDS(P,T,SCALE)
      CALL PLTIT(P,T,DEWPTS,LLAST)
  100 CONTINUE
      DEWPTS=.TRUE.
      LLAST=.FALSE.
      DO 200 LNT=1,JJ
      P=PS(LNT)
      T=TD(LNT)
      CALL XYCRDS(P,T,SCALE)
      CALL PLTIT(P,T,DEWPTS,LLAST)
  200 CONTINUE
      CALL CALCMP(0.0,0.0,2000,2)
      CALL CLSE35
      RETURN
      END
```

```
      SUBROUTINE DRWTFY(J2)
C
C        THIS SUBROUTINE PLOTS THE TEPHIGRAM BACKGROUND USING A DATASE
C        M15.LTFYBKGD,THIS WAS INITIALISED USING M12.CSRCELIB(TEFIBGRD
C        SEE SEPERATE NOTES IN FOLDER.
C
      DIMENSION DATA(100)
      DASH=0.08
      ASSIGN 40 TO INUM
   20 K=1
      READ(J2,END=500)(DATA(I),I=1,100)
      ASSIGN 260 TO JNUM
      GO TO INUM,(40,60,80,100,120,140)
   40 IZ=DATA(K)
      K=K+1
      ASSIGN 200 TO KNUM
      GO TO 80
   60 IF(DATA(K).NE.9999.) GO TO 40
      K=K+1
      IF(K.NE.101) GO TO 60
      ASSIGN 60 TO INUM
      GO TO 20
   80 X=DATA(K)
      K=K+1
  100 Y=DATA(K)
      K=K+1
      GO TO 180
  120 IF(DATA(K).EQ.9999.) GO TO 60
      X=DATA(K)
      K=K+1
  140 Y=DATA(K)
      K=K+1
  180 GO TO KNUM,(200,220)
  200 CALL CALCMP (X,Y,0,1)
      ASSIGN 220 TO KNUM
      GO TO 260
  220 IF(IZ.LT.50) GO TO 230
      IZ=IZ-50
      CALL CALCMP (99,99,IZ,7)
      CALL DASHP(X,Y,DASH)
      CALL CALCMP (99,99,16,7)
      GO TO 260
  230 CALL CALCMP (X,Y,IZ,1)
  260 IF(K.NE.101) GO TO 280
      ASSIGN 120 TO INUM
      GO TO 20
  280 IF(DATA(K).NE.9999.) GO TO 300
  285 IF(DATA(K).NE.9999.) GO TO 290
      K=K+1
      IF(K.NE.101) GO TO 285
      ASSIGN 60 TO INUM
      GO TO 20
  290 IZ=DATA(K)
      K=K+1
      ASSIGN 200 TO KNUM
      IF(K.NE.101) GO TO 300
```

```
      ASSIGN 80 TC INUM
      GO TO 20
  295 ASSIGN 200 TO KNUM
  300 X=DATA(K)
      K=K+1
      IF(K.NE.101) GO TO 320
      ASSIGN 140 TO INUM
      GO TO 20
  320 Y=DATA(K)
      K=K+1
      GO TC 180
  500 REWIND J2
      RETURN
      END
```

DRWVLS

```
      SUBROUTINE DRWVLS(K2)
C
C        THIS SUBROUTINE WRITES THE VALUES ON THE BACKGROUND USING
C        A DATASET M15.LTFYVALS, SEE ALSO DRWTFY
C
      DIMENSICN DATA(6)
   20 READ(K2,END=250)((DATA(I),I=1,5),NDEC)
      CALL NUMBER (DATA(1),DATA(2),DATA(3),DATA(5),DATA(4),NDEC)
      GO TO 20
  250 REWIND K2
      RETURN
      END
```

XYCRDS

```
      SUBROUTINE XYCRDS(P,T,SCALE)
C
C        THIS SUBROUTINE CONVERTS PRESSURE AND TEMP OR PRESSURE AND
C        DEWPOINT VALUES TO X-Y COORDINATES USED FOR PLOTTING THE DROP
C
      IF(T.LE.-273.2.OR.P.LE.0.0) GO TO 10
      PART=(ALOG10(T+273.2)-0.286*ALOG10(P)-1.579)
      Y=(0.71*(63.27*PART-0.098*T))
      X=89.49*PART-Y
      P=X*SCALE
      T=Y*SCALE
      RETURN
   10 P=0.0
      T=0.0
      RETURN
      END
```

PLTIT

```
      SUBROUTINE PLTIT(X,Y,DEWPTS,LLAST)
C
C        THIS SUBROUTINE PLOTS PRESSURE V'S TEMP AND PRESSURE V'S
C        DEWPOINT. THE FIRST CALL MOVES THE BEAM AT OFF POSITION TO
C        FIRST DATA POINT, SUBSEQUENT CALLS PLOT REQD LINE.
C
      LOGICAL*1 DEWPTS,LLAST,LCURNT
      IF(X.GT.10.0.OR.X.LT.-10.3) GO TO 50
      IF(Y.GT.15.4.OR.Y.LT.-.66) GO TO 50
      DASH=0.1
      LCURNT=.TRUE.
      IF(LLAST) GO TO 60
      CALL CALCMP (X,Y,0,1)
      GO TO 70
   60 IF(DEWPTS) GO TO 80
      CALL CALCMP (X,Y,99,1)
      GO TO 70
   80 CALL DASHP(X,Y,DASH)
      GO TO 70
   50 LCURNT=.FALSE.
   70 LLAST=LCURNT
      RETURN
      END
```

FIGURES :-

1. To demonstrate that a background of any desired shape can be constructed .
2. The use of INOTT or INOT
3. Flow diagram of how the main variables are dealt with .
4. Example of user created background with a CFO type box .
5. Example of use of J2 in production/non-production of a box .
6. Example of a dropsonde plot using permanent background datasets created specially for this purpose .
7. To demonstrate the ease of modification for specific purposes .
8. Example of production of two backgrounds on the same frame .
9. The standard CFO background and the method of its production .

Figure 1(a)

With time , patience , and computing units a background of almost any shape can be generated . The background below consists of five quadrilateral areas .

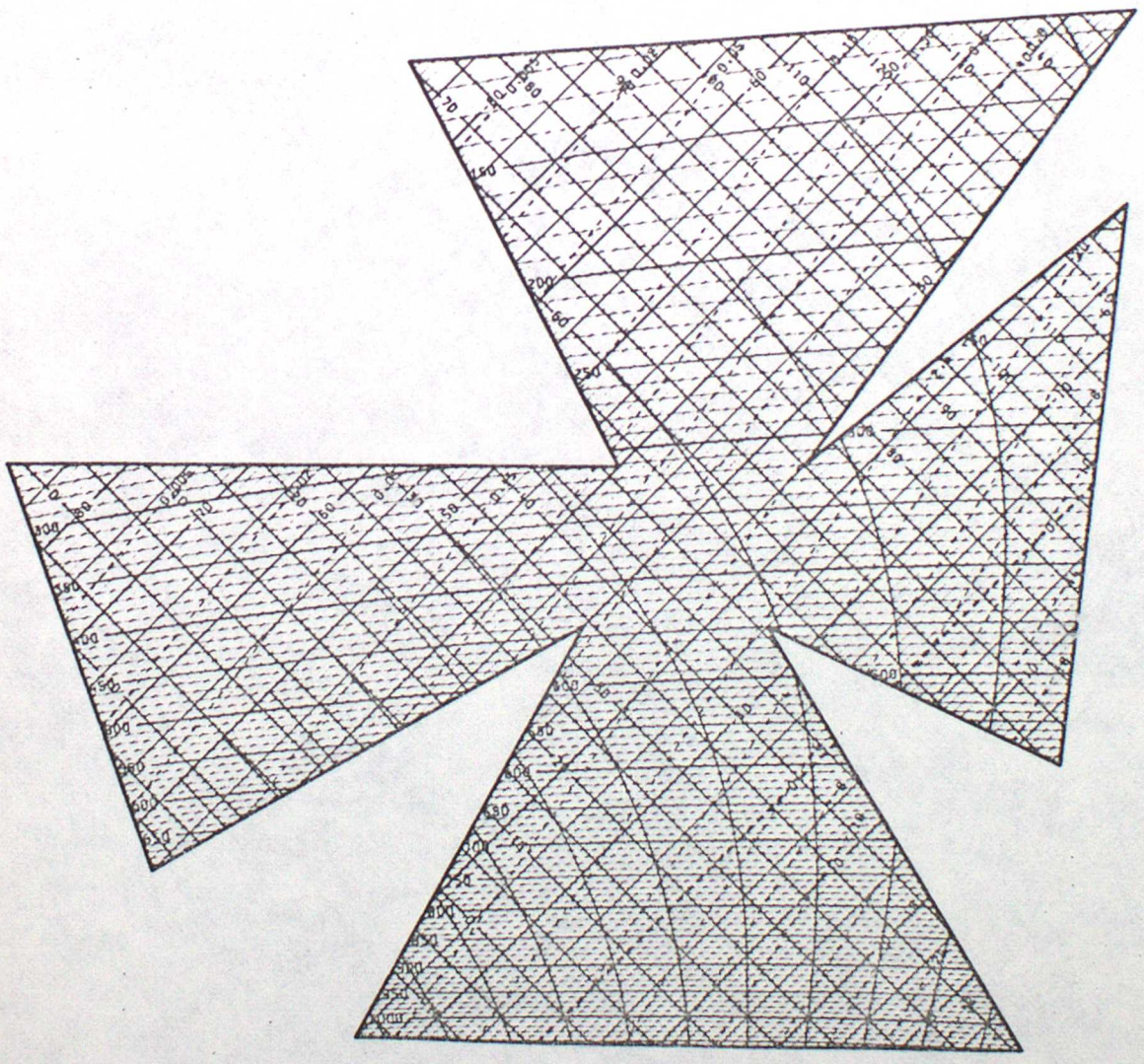


Figure 1(b)

Listed below is the data input for the background as shown in Fig 1(a) , plus the required JCL for creation of temporary datsets using TEFIBGRD .

```
//*INFORM PRINTDATA
//ONE EXEC FORTGCLG,PARM.FORT='XREF,MAP,ID'
//FORT.SYSIN DD DSN=M12.CSRCELIB(TEFIBGRD),DISP=SHR
//SYSIN DD *
//GO.FT20F001 DD DSN=&TEMP1,DISP=(NEW,PASS),UNIT=SYSDA,
//    SPACE=(TRK,(1,1))
//GO.FT21F001 DD DSN=&TEMP2,DISP=(NEW,PASS),UNIT=SYSDA,
//    SPACE=(TRK,(1,1))
//GO.SYSIN DD *
    5
   20
1.0
    1.0    5.0   10.0    2.0    5.0
    0
 110.   125.   320.   312.   -90.   -35.   -25.   -40.
  0   0   1   0
 320.   190.   600.   450.   -25.   -20.    20.   -15.
  0   0   0   1
 440.   450.  1050.  1038.   -30.   -15.    40.   -15.
  1   0   0   0
 250.   312.   440.   700.   -90.   -40.   -30.   -45.
  0   1   0   0
 312.   320.   450.   440.   -40.   -25.   -15.   -30.
  1   1   1   1
/*
//TWO EXEC FORTGCLG,PARM.FORT='XREF,MAP,ID'
//SYSIN DD *
```

```
      MAIN PROGRAM & SUBROUTINES
      .
      .
      .
      .
```

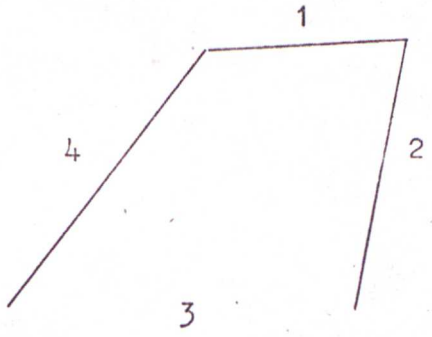
```
//LKED.PIGGY DD DSN=MET.CALCOMP,DISP=SHR
//LKED.SYSIN DD *
    INCLUDE PIGGY(OPENON35,SCINT,GENERAL)
//GO.FT08F001 DD SYSOUT=K
//GO.FT30F001 DD DSN=&TEMP1,UNIT=SYSDA,DISP=(SHR,DELETE)
//GO.FT31F001 DD DSN=&TEMP2,UNIT=SYSDA,DISP=(SHR,DELETE)
/*
//
```

Fig 2.

Example Use Of INOTT Or INOT.

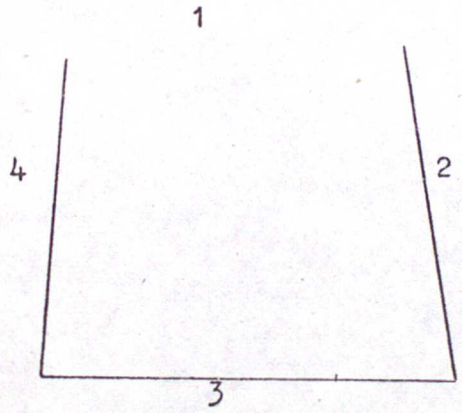
INOTT(n)	1	2	3	4
	0	0	1	0

Will give :-



INOTT(n)	1	2	3	4
	1	0	0	0

Will give :-



When used together with two loops through the program the resulting shape will be as given below , provided that the "joining" data points coincide .

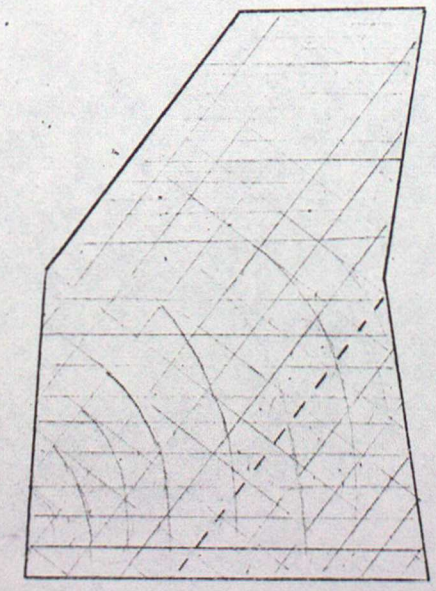
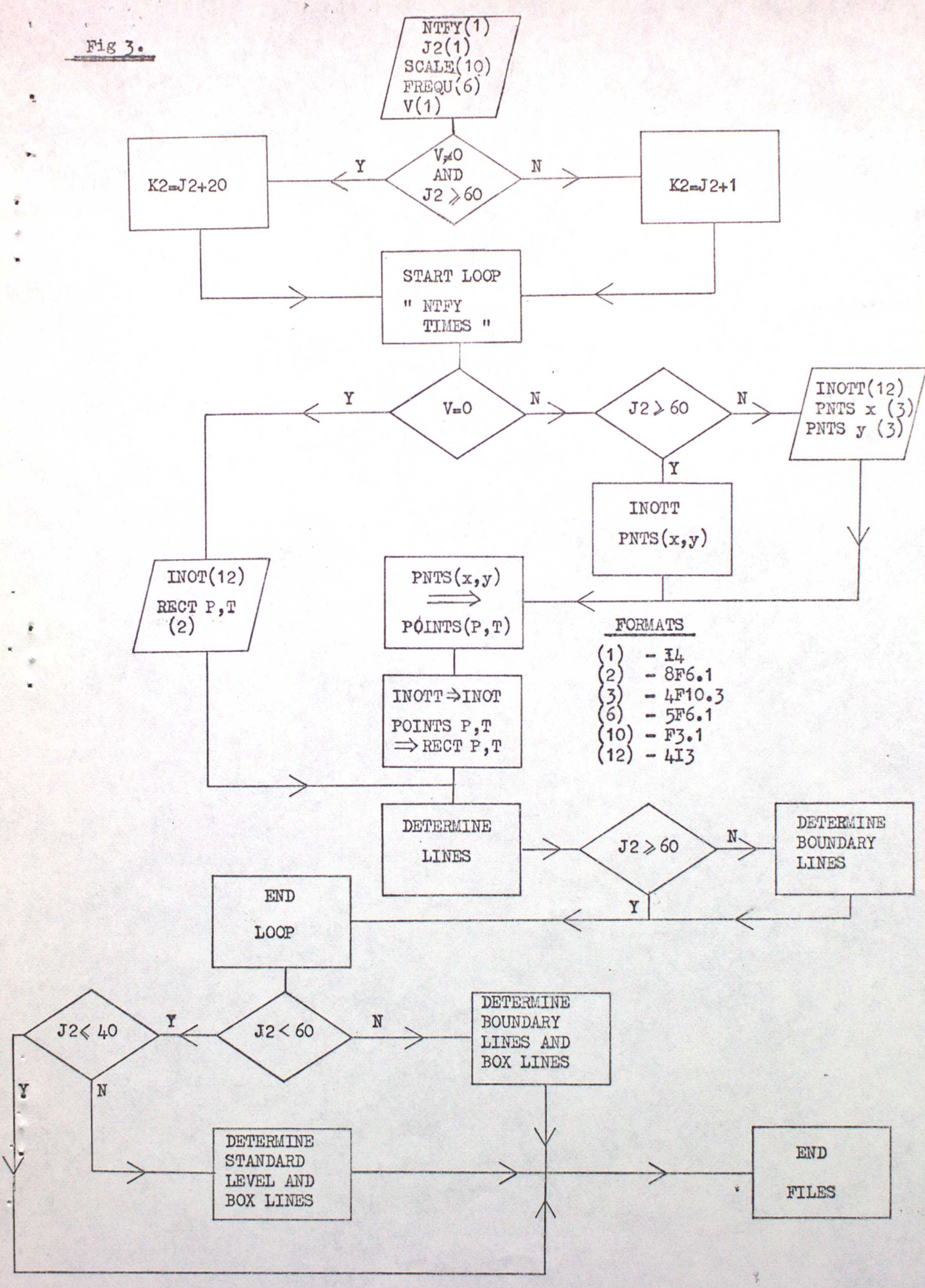


Fig 3.



FORMATS

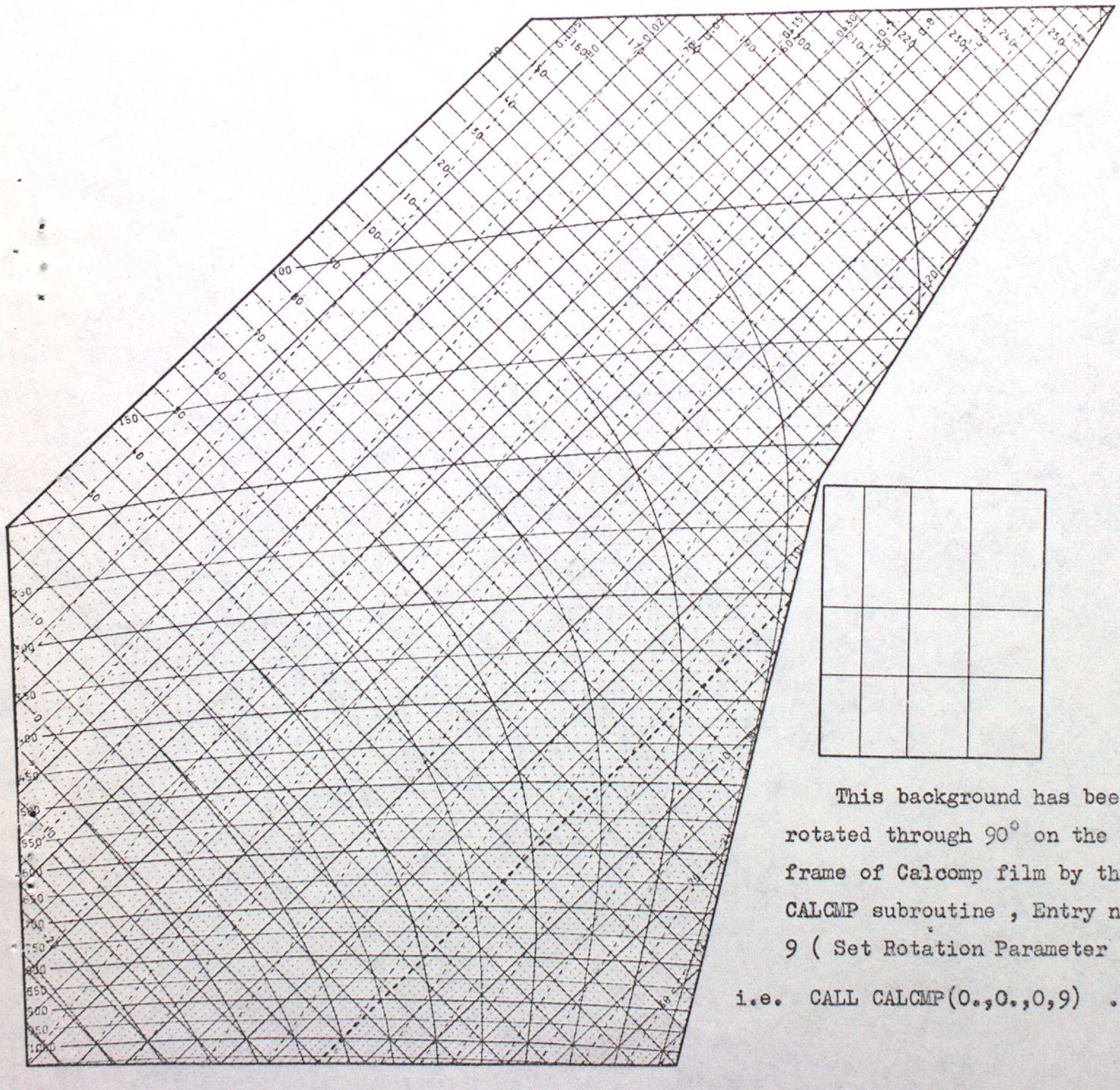
(1) - I4
(2) - 8F6.1
(3) - 4F10.3
(6) - 5F6.1
(10) - F3.1
(12) - 4I3

Fig 4.

" CFO TYPE " Background (with box.)

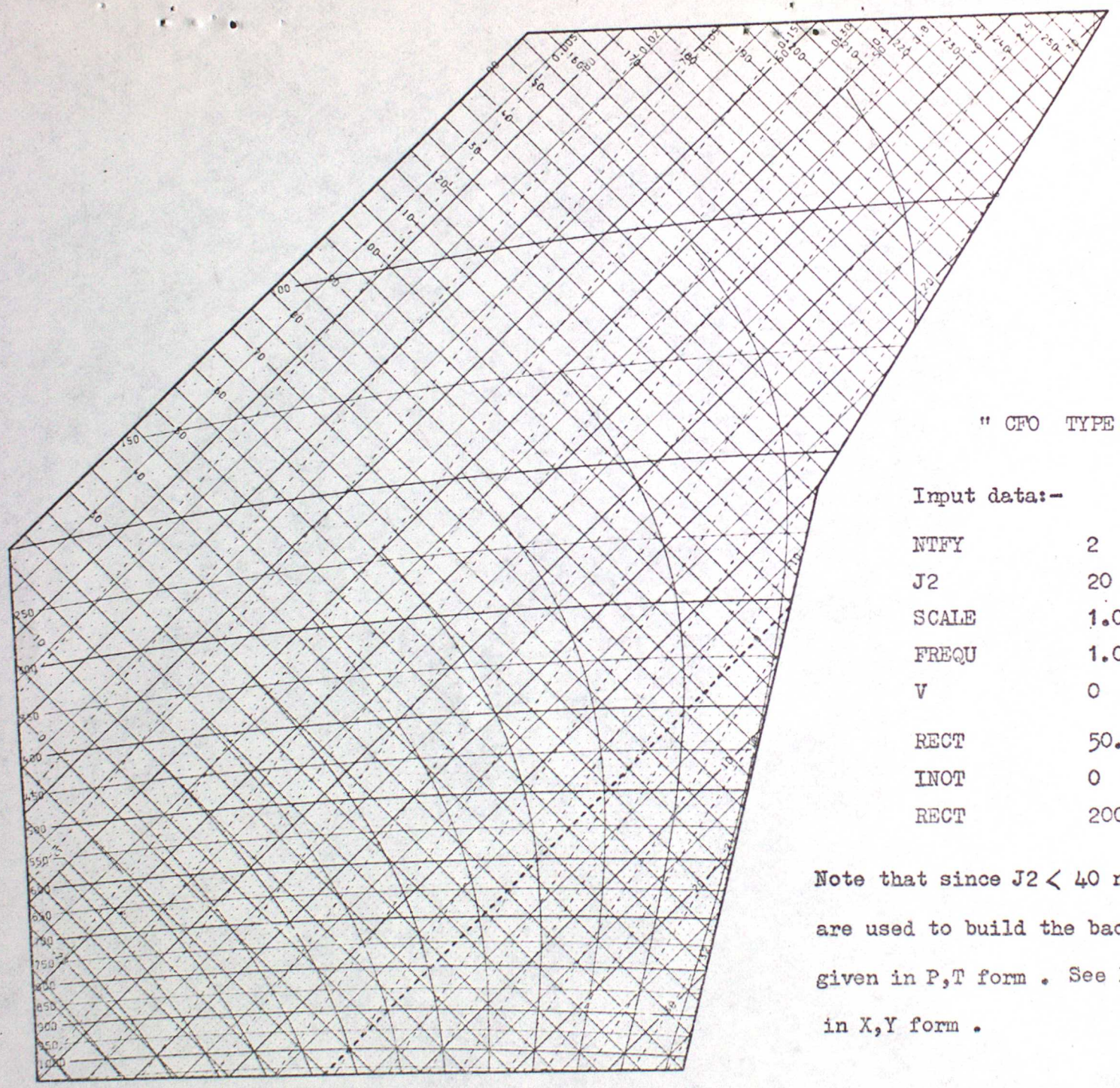
Input data:-

NTFY	2
J2	44 N.B. 40 < J2 < 60
SCALE	1.0
FREQU	1.0 5.0 10.0 2.0 5.0
V	0
RECT	50.0 60.0 220.0 200.0 -90.0 -30.0 -10.0 -90.0
INOT	0 0 1 0
RECT	200.0 220.0 1035.0 1050.0 -90.0 -10.0 38.0 -30.0
INOT	1 0 0 0



This background has been rotated through 90° on the frame of Calcomp film by the CALCMP subroutine , Entry no. 9 (Set Rotation Parameter),

i.e. CALL CALCMP(0.,0.,0,9) .



" CFO TYPE " Background (without box.)

Input data:-

NTFY	2					
J2	20	N.B. J2 < 40				
SCALE	1.0					
FREQU	1.0	5.0	10.0	2.0	5.0	
V	0				-10.0	-90.0
RECT	50.0	60.0	220.0	200.0	-90.0	-30.0
INOT	0 0 1 0				38.0	-30.0
RECT	200.0	220.0	1035.0	1050.0	-90.0	-10.0

Note that since J2 < 40 no box has been produced . Two areas are used to build the background , their bounding points are given in P,T form . See Fig 7. for an example of input data in X,Y form .

Fig 6.

The final product as generated by the program listed previously . The two datasets required for this background are held on MET059 . They are M15.LTFYBKGD and M15.LTFYVALS .

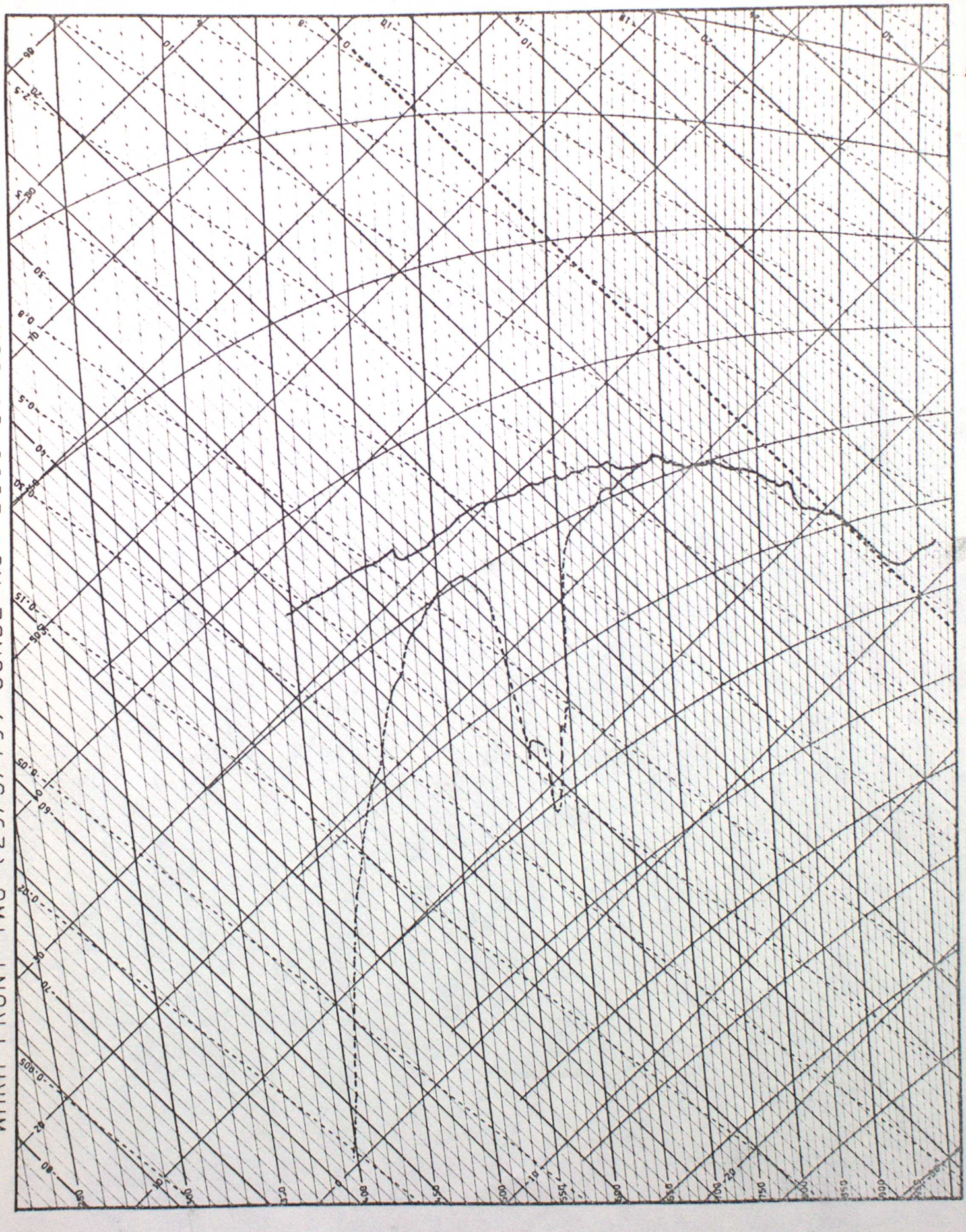


Fig 7(a).

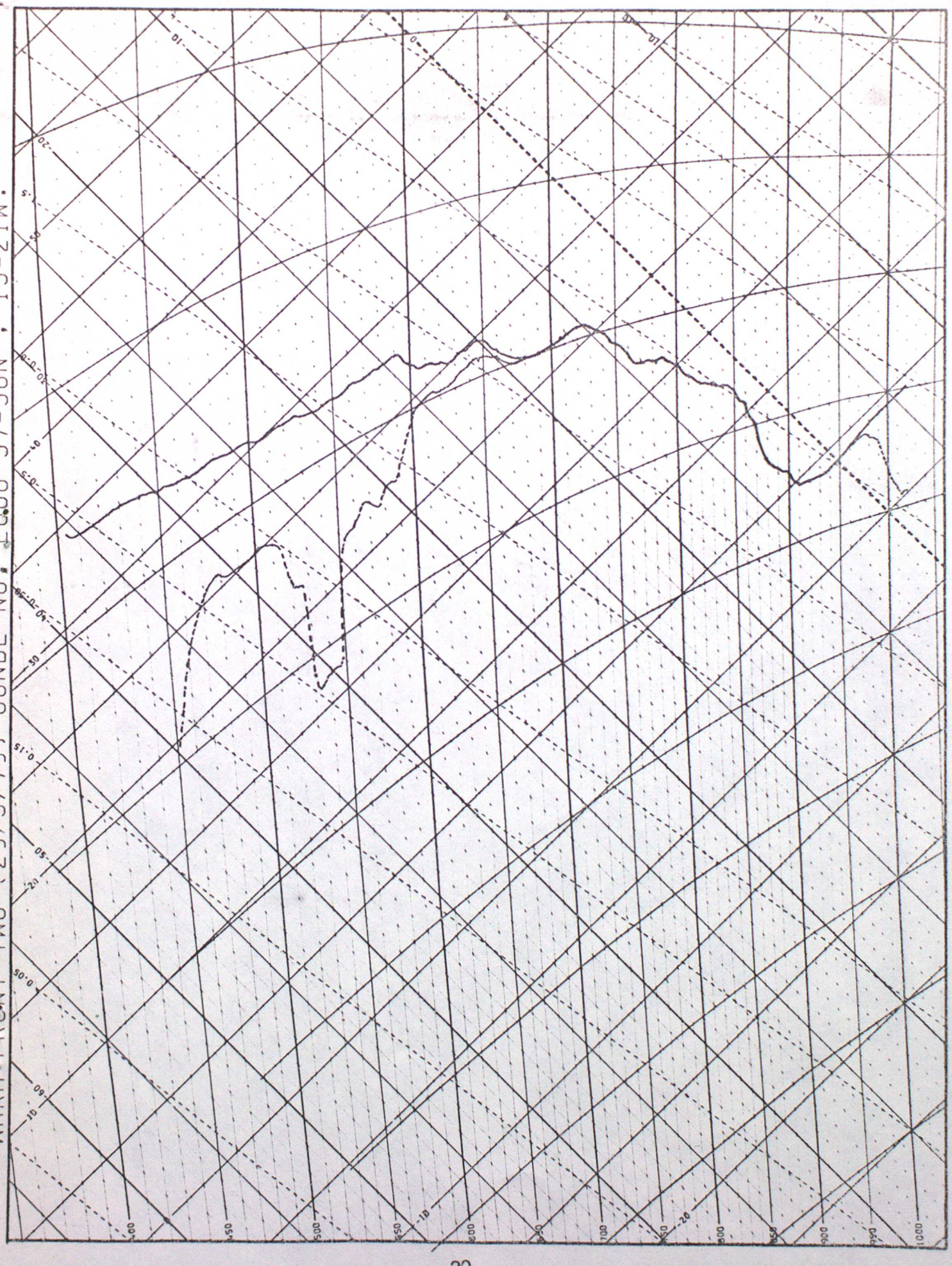


Fig 7(b).

The tephigram shown in part (a) was created by the program listed below . The program is a " rush job " modification to that used in the production of Fig 6 , but it serves as a good example of how easy it is to change the actual plot and place it on a temporary background . Several points should be noted :-

1. The scale has been increased from 2.2 to 3.0 .
2. The four defining points of the rectangle are given in X,Y form , ∴ V=-1 .
3. Since a temporary background is used a change of location of the logical origin is required , CALL CALCMP(13.2,1.2,0,3) .
4. Also leading from 3. the check made in PLTIT to ensure the plot is within the frame uses the X,Y coordinates of the four defining points and since a change of background is made , these points will also change .
5. The dewpoint plot has been cut off for values below -40°C .

```
//*INFORM PRINTDATA
//ONE EXEC FORTGCLG,PARM.FORT='XREF,MAP,ID'
//FORT.SYSIN DD DSN=M12.CSRCELIB(TEFIBGRD),DISP=SHR
//SYSIN DD *
//GO.FT20F001 DD DSN=&TEMP1,DISP=(NEW,PASS),UNIT=SYSDA,
//   SPACE=(TRK,(1,1))
//GO.FT21F001 DD DSN=&TEMP2,DISP=(NEW,PASS),UNIT=SYSDA,
//   SPACE=(TRK,(1,1))
//GO.SYSIN DD *
    1
  20
3.0
   1.0    5.0   10.0    2.0    5.0
  -1
  0  0  0  0
   -12.900      8.700      8.700     -12.900
    15.300     15.300     -1.050     -1.050
/*
//TWO EXEC METMER,L='M15.SOURCLIB',M=RLOC02#
//UPDTE.SYSIN DD *
./ CHANGE LIST=ALL
      SCALE=3.0
      CALL CALCMP (13.2,1.2,0,3)
      IF(DEWPTS.AND.T.LE.-40.0) GO TO 200
      IF(X.GT.8.7.OR.X.LT.-12.9) GO TO 50
      IF(Y.GT.15.3.OR.Y.LT.-1.05) GO TO 50
/*
//THREE EXEC FORTGCLG,TIME.GO=3
//FORT.SYSIN DD DSNAME=&CARDS,DISP=(OLD,DELETE)
//LKED.PIGGY DD DSN=MET.CALCOMP,DISP=SHR
//LKED.SYSIN DD *
   INCLUDE PIGGY(OPENON35,SCINT,GENERAL)
//GO.FT07F001 DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1729)
//GO.FT08F001 DD SYSOUT=K,DCB=(RECFM=FB,LRECL=80,BLKSIZE=2000)
//GO.FT11F001 DD DSN=M15.EME008,UNIT=DISK,VOL=SER=SYS003,DISP=SHR
//GO.FT44F001 DD DSN=&TEMP1,UNIT=SYSDA,DISP=(SHR,DELETE)
//GO.FT45F001 DD DSN=&TEMP2,UNIT=SYSDA,DISP=(SHR,DELETE)
```

THIS EXAMPLE DRAWS TWO BACKGROUNDS OF SCALE SIZE 3.9

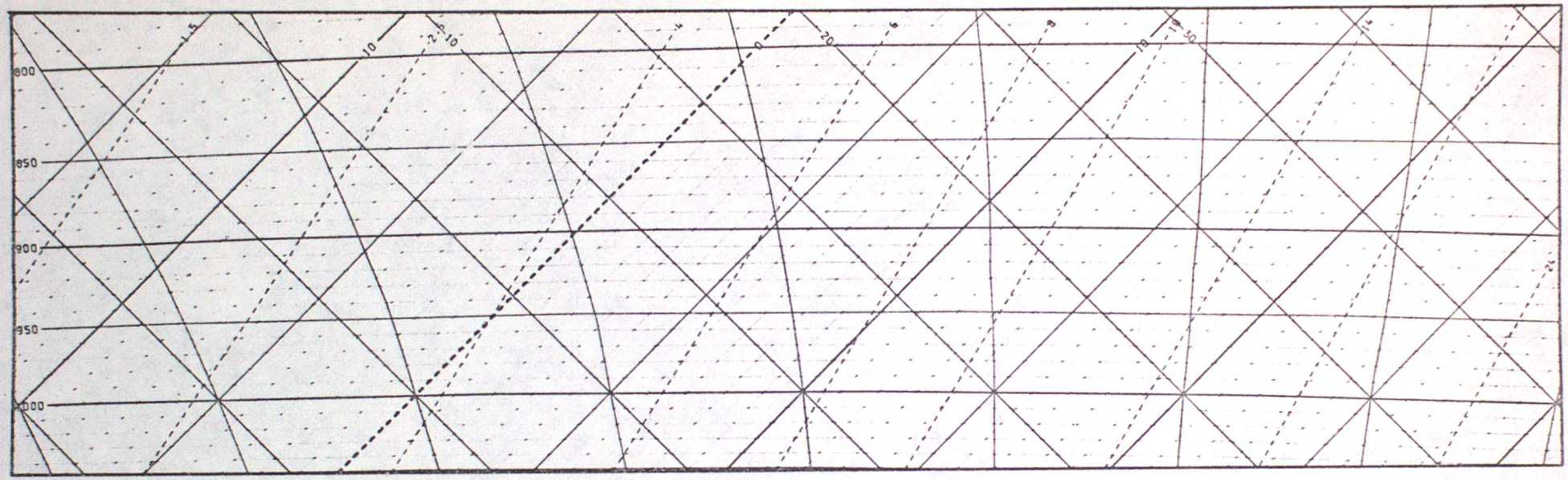


Fig 8

THE LIMITS ARE SET WITH CARDINGTON DATA IN MIND.

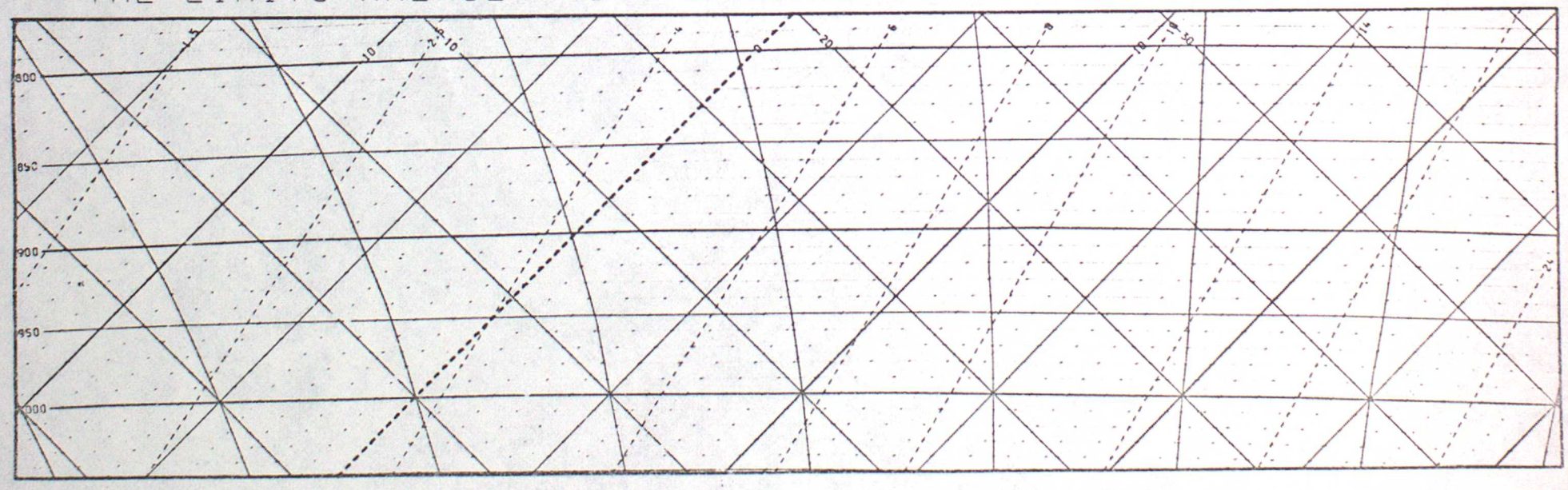


Fig 9(a).

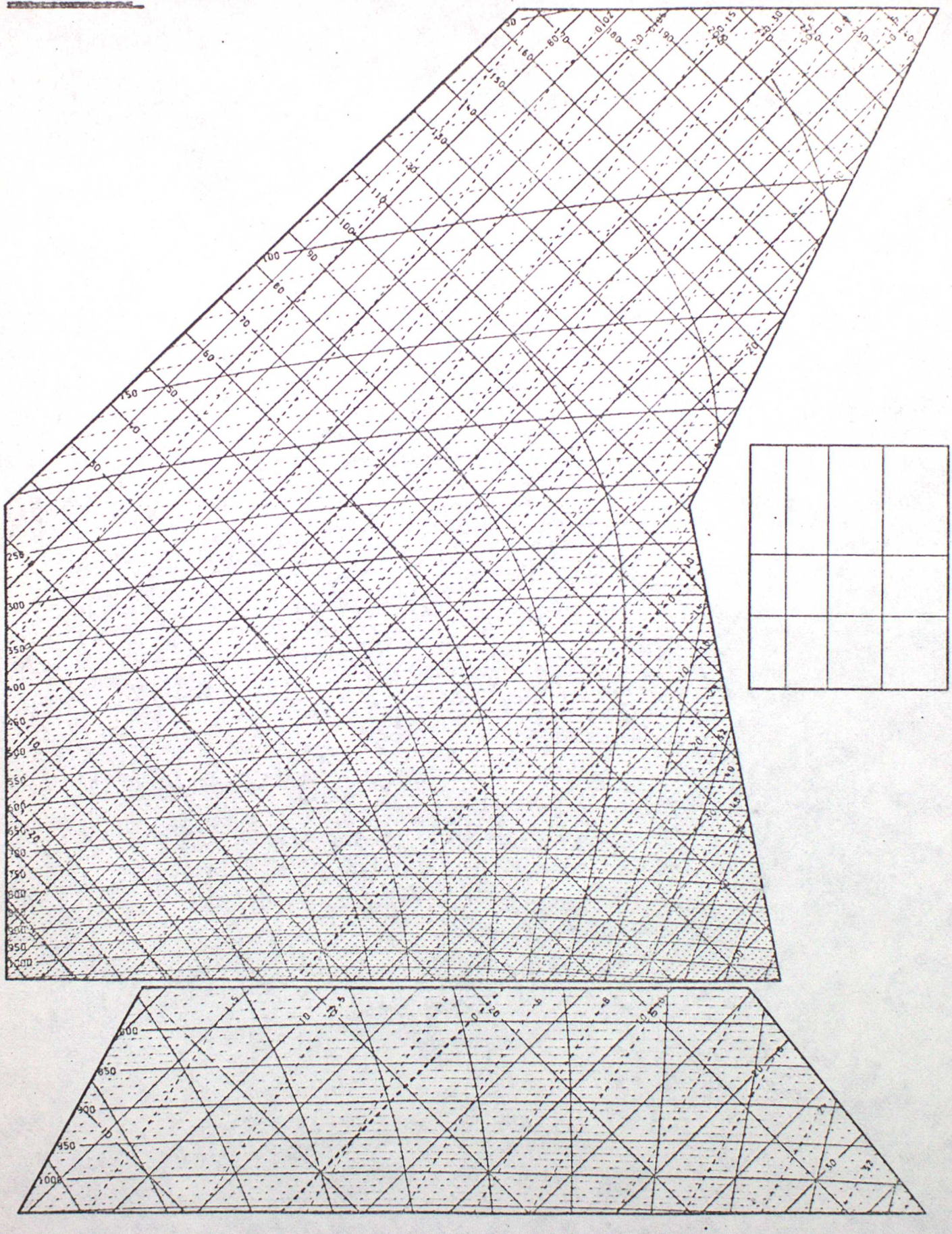


FIG 9(b). The program below produced the "standard " CFO type background as shown in part(a). Note the use of the four permanent datasets held on METOO3 , and also the subroutines EDRWTFC , EDRWVLC , and EXYCRDS held on M12.COBJOFF on METOO3 . EDRWTFC and EDRWVLC are the direct access versions of DRWTFY and DRWVLS respectively .

```
//M35LTEF9 JOB (M3532,L),PYWELL,2595,PRTY=8,REGION=192K
//*INFORM PRINTDATA
//*INFORM SETUP=YES
//*INFORM SYSTEM=P95
// EXEC FCRTGCLG
//SYSIN DD *
      CALL OPEN35
      CALL CALCMP(0,0,1,9)
      CALL CALCMP (6.0,4.72,0,3)
      CALL DRWTFY(30)
      CALL DRWVLS(31)
      CALL CALCMP (6.0,1.22,0,3)
      CALL DRWTFY(32)
      CALL DRWVLS(33)
      CALL CALCMP(0.0,0.0,2000,2)
      CALL CLSE35
      STOP
      END
/*
//LKED.PIGGY DD DSN=MET.CALCOMP,DISP=SHR
//LKED.CHARLY DD DSN=M12.COBJOFF,UNIT=DISK,VOL=SER=METOO3,DISP=SHR
//LKED.SYSIN DD *
   INCLUDE CHARLY(EDRWTFC,EDRWVLC,EXYCRDS)
    INCLUDE PIGGY(OPENON35,SCINT,GENERAL)
//GO.FT08F001 DD SYSOUT=K
//GO.FT30F001 DD DSN=M12.B1G44TFB,UNIT=DISK,DISP=SHR,VOL=SER=METOO3
//GO.FT31F001 DD DSN=M12.B1G44VLS,UNIT=DISK,DISP=SHR,VOL=SER=METOO3
//GO.FT32F001 DD DSN=M12.SMA40TFB,UNIT=DISK,DISP=SHR,VOL=SER=METOO3
//GO.FT33F001 DD DSN=M12.SMA41VLS,UNIT=DISK,DISP=SHR,VOL=SER=METOO3
/*
//
```