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SCT SYSTEMS CONTROL TECHNOLOGY, INC.

August 29, 1988

TACTICAL INTERIM PLANNING SOFTWARE
(TIPS)

USERS MANUAL


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                              TACTICAL INTERIM PLANNING SOFTWARE
                          (UNIT-LEVEL FLIGHT PLANNING FOR THE F-111A/D/F)
TIPS
   1.0                                DEVELOPED BY:


                                       PALO ALTO, CA

                                     UNDER CONTRACT TO:

                                        HQ USAFE/DO
                                     RAMSTEIN AB, GERMANY
                                  (CONTRACT NO. F61546-85-C-0054)


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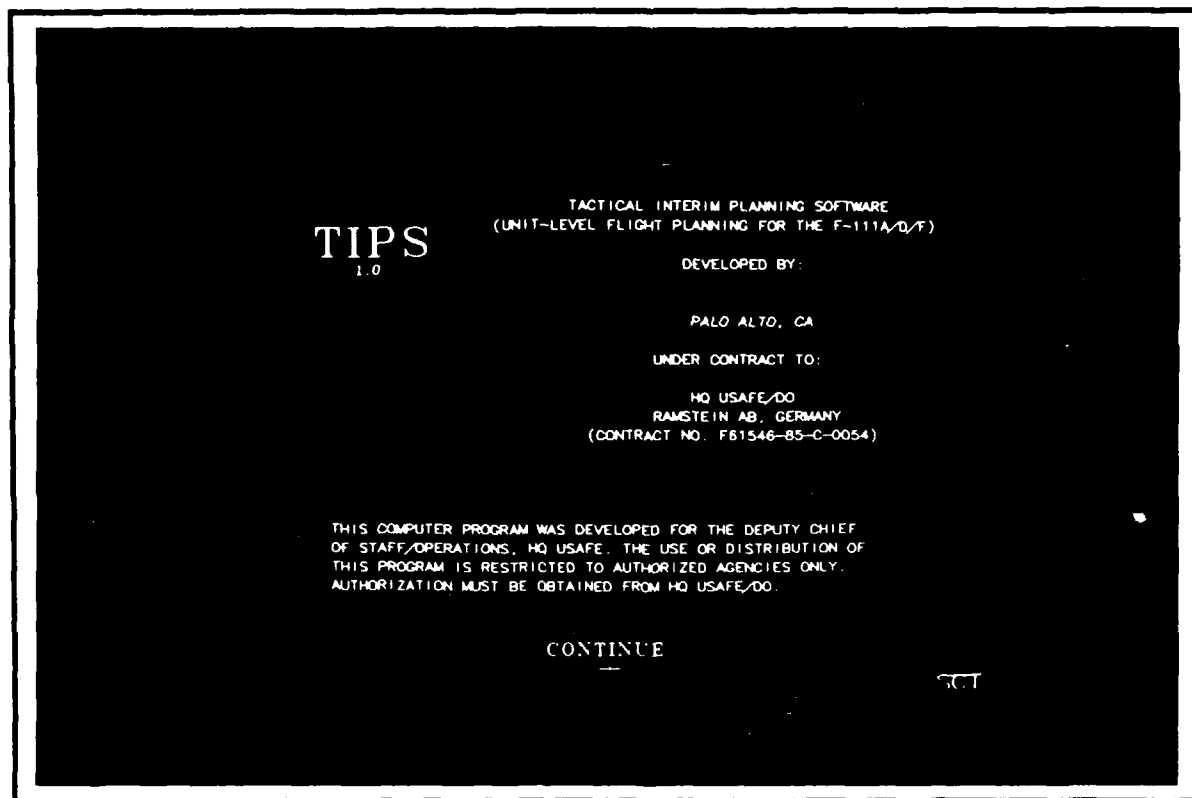
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19. ABSTRACT (Continue on reverse if necessary and identify by block number)
The Tactical Interim Planning Software (TIPS) is a computer software package developed by Systems Control Technology, Inc (SCT) for the United States Air Forces in Europe (USAFE). The purpose of this document is to provide an elementary users manual for the TIPS software. TIPS provided an interim F-111 unit-level mission planning system for the European environment. It contains the capabilities to generate flyable routes, display DMA video disk maps, produce automated radar predictions, and output a complete colored combat mission folder. TIPS was designed with an easy-to-use mouse driven graphics intensive program for both peacetime and wartime scenarios. TIPS allows the operator to create flyable 3D routes, using lat-long coordinates, TACAN points, and graphically input coordinates or any combination of these points. TIPS takes into consideration 3D digital terrain, altitude winds, temperature, aircraft airspeed and bank angles. Also considered for route generation, are the SAM threats, low-level transit route points, transit corridors, and IFF-ON/OFF lines. Using this information, TIPS produces a Form 691 flight plan, in-route and at target radar predictions, and colored combat mission folder maps.

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SECTION I

INTRODUCTION

I.1 PURPOSE OF THE USERS MANUAL

This is the users manual for the TIPS (Tactical Interim Planning Software) program. It is written for mission planners who use the system to plan routes and produce Form 691 and Combat Mission Folder output. This manual is written with the intention of introducing those mission planners to the TIPS program. It is written in enough detail to allow the user to begin using TIPS immediately, while at the same time trying not to bog the user down with too many details, many of which are intuitively obvious and/or can be learned by using the on-line help feature of TIPS.

The TIPS system consists of three programs which serve separate functions in the unit level planning process. The Statespace Update Program (SUPR) is used for the creation and maintenance of the electronic order of battle and threat lethality ("statespace") information. The TIPS Data Base Program (TIPSDB) is used to maintain the necessary TIPS data files. The TIPS program provides the actual mission planning functions.

It is important to note that the mission planners need only know how to use the TIPS program, which is the only program that this manual addresses. The TIPS data base administrator is responsible for creating and maintaining the TIPS data base which involves using the TIPSDB and SUPR programs. The data base administrator should refer to the TIPS Data Base Specification/Data Base Administrator's Manual for instructions on how to perform the data base administrator tasks.

I.2 TIPS OVERVIEW

The purpose of the TIPS program is to provide an interim F-111 unit-level planner for the European environment, to be used by the 20th Tactical Wing at RAF Upper Heyford. This prototype system contains the capabilities to generate flyable

routes, display videodisk maps, produce automated radar
predictions, and output combat mission folder (CMF) materials.

The TIPS program was designed to be an easy-to-use,
graphics intensive program, with as many default options as
possible to minimize the number of responses the user must make
to plan a route. TIPS allows the user to create routes
textually, using the keyboard to type in coordinates or TACAN
points, or graphically, using the graphics capability and the
mouse, or more commonly, using a combination of both methods.

During peacetime flight planning, TIPS takes into
consideration terrain, winds, temperature, airspeed, and bank
angles. During wartime, TIPS also considers threats, the FLOT,
LLTRs, transit corridor routes, and IFF-ON/OFF lines. Using
this information, TIPS produces a Form 691 flight plan, radar
predictions and CMF maps.

SECTION II

SAMPLE SESSIONS

In this section, two TIPS sample sessions are presented. The first sample session describes how to create a route during peacetime; the second one describes how to create a route during wartime. Although these examples do not use all of the options available in TIPS, the user who understands the use of the options in these sample sessions will be able to use, explore, and learn the other TIPS options on their own. The description of any TIPS option may be found by asking for HELP while running TIPS. The HELP feature is described in Section III of this manual. The reader is encouraged to follow these step-by-step sample sessions while logged on to the computer; what you read will make a lot more sense!

II.1 PEACETIME SAMPLE SESSION

This sample session covers the following steps (the numbers correspond to the numbered paragraphs below):

1.	Log on to the computer
2.	Run TIPS
3,4,5.	Input values in the INIT menu
6,7.	Go to Route Generation (RGEN) menu
8,9.	Create the route textually
10.	Create the route graphically
11.	Save the Session
12.	Print entire route
13.	Print legs of route
14.	Print Form 691 from RGEN menu
15.	Exit TIPS

1.   Log on to the computer. Ask your system administrator for the log on procedure. In general, you will need to hit the carriage return and then enter the user name and password, per the system prompts. The system (or data base) administrator will provide these.

2.   Run TIPS by typing:

TIPS(CR)

(Whenever you see '(CR)' in this manual, it means, press the carriage return key on the keyboard terminal.)

The program logo is then displayed.

3.   To proceed to the first menu, use the mouse to position the cursor in the CONTINUE command box (actually anywhere on the screen will do) and click the mouse (any button on the mouse will work - TIPS makes no distinctions between the mouse buttons).

The Initial Planning (INIT) menu is then displayed (see Figure II.1-1). This menu displays the default values for the route. The INIT menu allows the user to change any of these initial values.
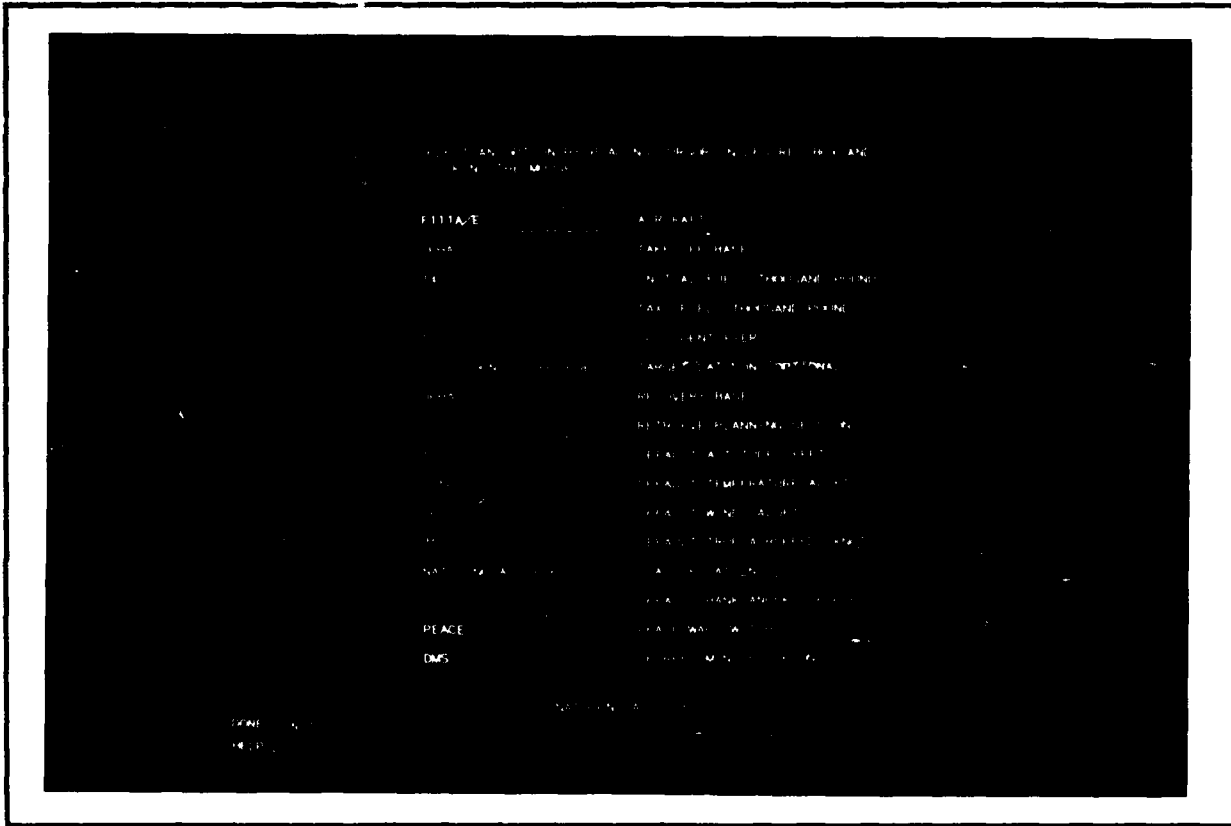
Figure II.1-1   Initilization (INIT) Menu

All of the values on the INIT menu in blue boxes
(i.e., all boxes except AIRCRAFT, PEACE and DMS)
can be changed by clicking the mouse in the box and
typing in a new value. The AIRCRAFT, PEACE and DMS
command boxes are toggles. Clicking the mouse in
the AIRCRAFT command box will toggle the aircraft
types between F111A/E, F111D and F111F. Clicking
the mouse in the PEACE command box will toggle the
PEACE option to WAR. The DMS (degrees-minutes-
seconds) command box is a four-way toggle. The DMS
options specify input/output format of latitude and
longitude. The options are degrees-minutes-seconds
(DMS); degrees-minutes (DM); decimal degrees (D) or
UTM, respectively. Clicking the mouse once in the
DMS command box changes DMS to DM, clicking again
toggles the command box to D, clicking a third time
changes the D command box to UTM and of course
clicking again brings you back to DMS. We will use
the DMS format for most of this example.

In our sample we do not need to change the PEACE
command box because we are building a peacetime
route.

4.   Change the SCL to 10. Click the mouse in the SCL
     (Standard Configuration Load) box, and TIPS will
     prompt you to type in an SCL. If you don't know
     the SCL you can get a list of SCLs by typing

     X(CR)

     or any other non-blank character (that is not a
     valid SCL).

     Try it. You will see a smaller menu, the LIST menu
     (Figure II.1-2). It covers about one-quarter of
     the screen. This menu contains an alphabetical
     listing of all the SCLs. The number of SCLs may be
     small enough that they will all fit on the menu.
     If there are more SCLs than can fit on one page,
     they are divided into pages and the user can use
     the ADVANCE and BACKUP buttons and the "elevator"
     to the right of the list to move through the pages.
     Find the SCL "10" in the list and select that SCL
     with the mouse. The list menu disappears, the INIT
     menu is once again active and the value in the SCL
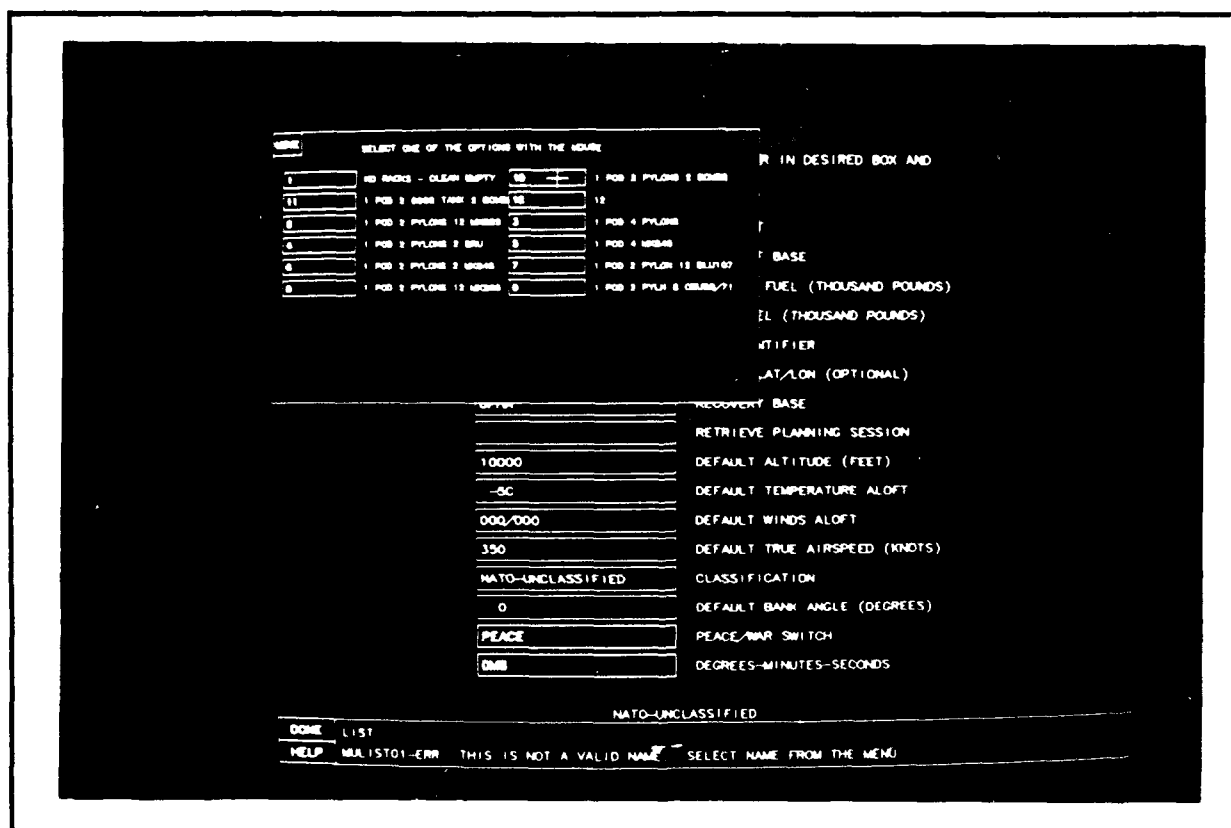   command box now reads 10.

Figure II.1-2   LIST Menu Showing SCLs

5   The only other initial value we wish to change in
        this menu is DEFAULT WINDS. Suppose that today's
        winds aloft are from the west at 50 knots. Using
        the mouse, position the cursor in the DEFAULT WINDS
        command box and click. Enter the following value
        for the DEFAULT WINDS:

        270/50(CR)

        Blanks are not allowed either before or after the
        slash.

6.   We are now finished with the INIT menu. To
        proceed, position the cursor in the DONE command
        box and click the mouse. The MAIN menu is then
        displayed (Figure II.1-3).

        From the MAIN menu we can branch to the TIPS main
        functional areas; Route Generation, Combat Mission
        Folder and Radar Prediction.
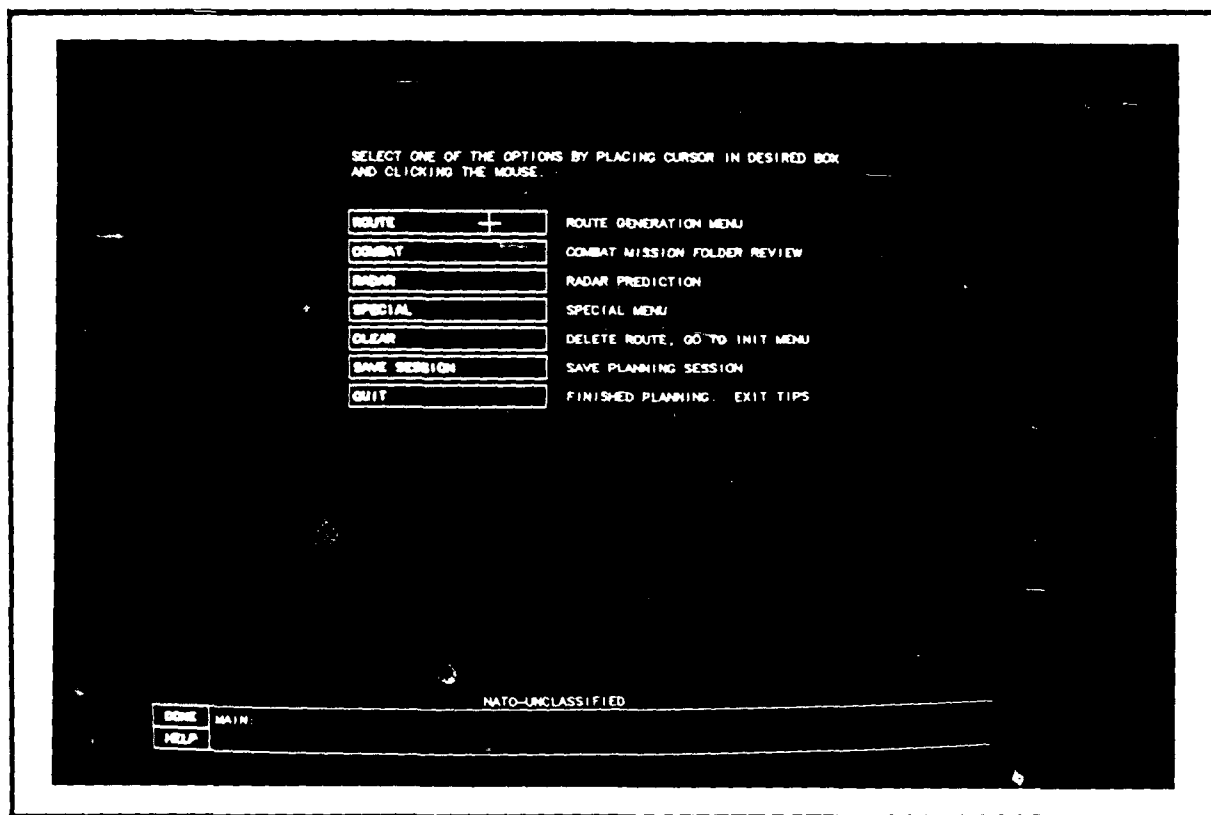

Figure II.1-3   Main Menu

7.   We are ready to create the route so we will branch
        to the RGEN (Route Generation) menu. To do this,
        position the cursor on the ROUTE command box and

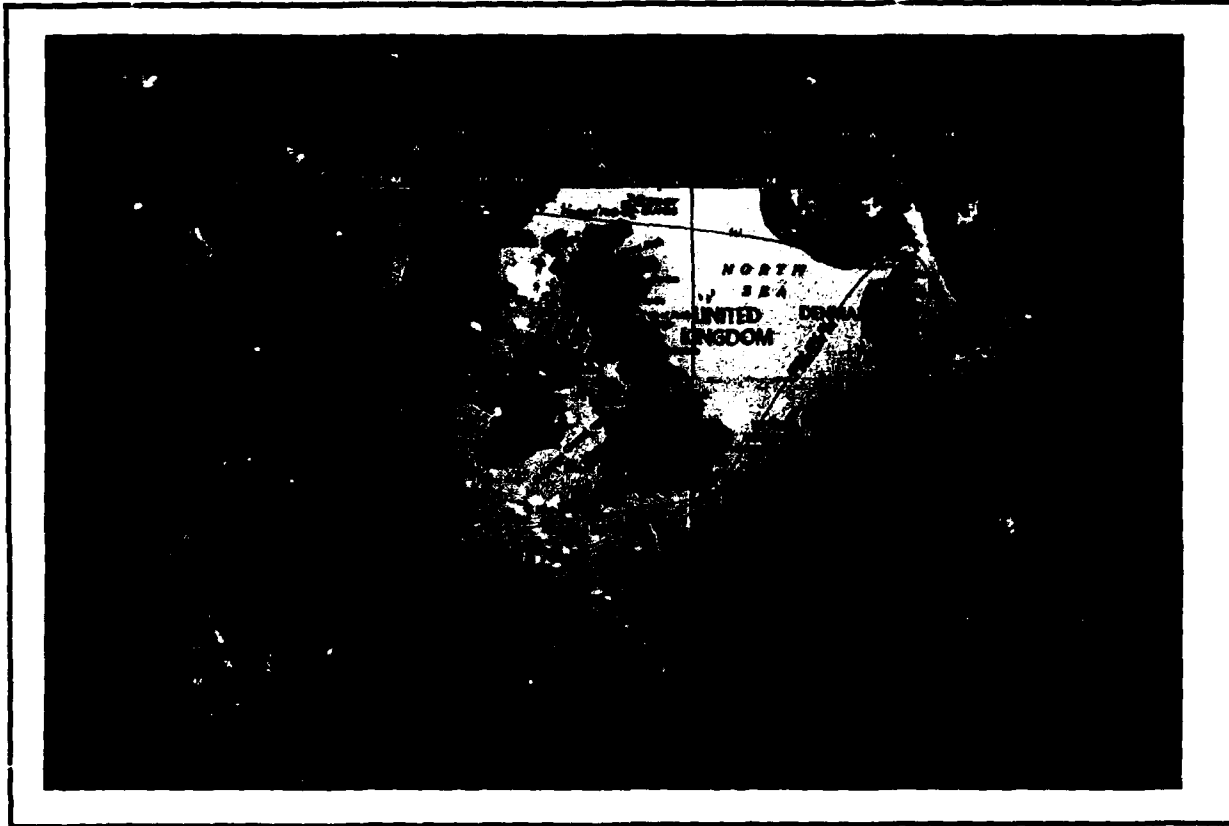click the mouse.   The RGEN menu is displayed
(Figure II.1-4).

Figure II.1-4 Route Generation (RGEN) Menu

The RGEN menu is a graphic menu. You will see a
purple circle around the take-off base. Had we
selected a target in the INIT menu, you would have
seen a straight-line route from the take-off base
to the target and back to the recovery base.

Along the top of the menu is one line from the 691.
The line displays the Form 691 values for the
selected waypoint (the selected waypoint is denoted
on the videomap by a circle around the waypoint).

All of the colored boxes on the top line may be
changed. The black boxes are informative only and
may not be changed.

The column of command boxes to the left of the
screen starting with the SELECT POINT command box
is made up of commands for creating and
manipulating the route graphically. Notice that
there is a command box to delete a point but there
is no command box to insert a point. This is
because the RGEN menu is nominally in the Insert-a-

Point Mode. By simply positioning the cursor on
the desired location on the screen and clicking the
mouse, you can insert waypoints into the route.

Let's start creating our route.

8.   First we will use the TEXT INSERT command box to
      insert two different types of waypoints into the
      route, a SID and a (regular) waypoint. To insert
      these points, position the cursor on the TEXT
      INSERT command box and click the mouse. TIPS is
      ready to accept input. Type in the following SID:

      MAR3(CR)

      Even though you typed a carriage return, TIPS is
      still ready to accept input for another waypoint
      entry in TEXT INSERT. ONLY BY TYPING ANOTHER
      CARRIAGE RETURN DO YOU RETURN TO THE GRAPHIC INSERT
      MODE. Before we leave TEXT INSERT, we will also
      insert the next waypoint. Type the following entry
      in the TEXT INSERT command box:

      NTP 179/12(CR)

      This corresponds to a TACAN reference point. The
      TACAN site is NTP, the radial is 179 degrees and
      the DME reading is 12 nautical miles. (TIPS
      figures out what the LAT/LON is for that TACAN
      point.) Now type another carriage return to get
      out of the TEXT INSERT mode:

      (CR)

      We are now back in the graphic insert mode.

9.   We will now change two values on the 691 line;
      altitude and airspeed.

      To change the altitude, position the cursor on the
      ALT command box (this is the box just below the
      ALT/DST heading), click the mouse and then type the
      following altitude:

      1600(CR)

      To change the airspeed, position the cursor on the
      TAS command box (this is the box just below the
      TAS/GS heading), click the mouse and then type in
      the following air-speed:

      450(CR)

(If the GS was entered, TIPS would have figured out the TAS.)

10.   Now practice inserting some points into the route. Since there are no active commands in RGEN and since the Textual Mode is not being used, we are automatically in the Insert-a-Point mode. Using the mouse, position the cursor anywhere on the graphics screen and click the mouse. You just inserted a waypoint.

Notice that the new waypoint was inserted after the selected waypoint (in this case the waypoint whose ID is 1, the one we inserted in step 8, was our selected waypoint) and the new waypoint is now the selected waypoint.

When inserting the next waypoint, notice how only some values on the Form 691 line may change (ID, checkpoint, distance, magnetic course, magnetic variation, leg time, total time, leg fuel and remaining fuel). The other values, (altitude, true airspeed, ground speed, winds, temperature and bank angle) are carried over from the previous (selected) waypoint.

Insert a waypoint and then delete it. To delete a waypoint, position the cursor in the DELETE POINT command box and then click the mouse. The selected waypoint is deleted and the new selected waypoint is the waypoint before the deleted waypoint.

11.   TIPS allows us to save the route. We can either save the entire session which saves both the route and Form 691 parameters or we can save just the geographic locations of the waypoints of the entire route or part of the route.

In this example we will save the entire session. It is a good idea to do this periodically (after inserting points, deleting points and changing Form 691 values, for example) while in the RGEN menu; this way you will have your work saved in the event of a system crash.

To save the session, position the cursor on the SAVE SESSION box. The SAVE menu, a quarter-size menu is displayed over the RGEN menu (Figure II.1- 5). This menu has boxes to enter an identifier (name) and a description for the session.

Click the mouse on the IDENTIFIER box on the SAVE menu. We will name this session SAMPLE1. Type the following name (if you make a mistake before

hitting the carriage return key, type the delete
key to backspace then retype the entry):

SAMPLE1(CR)

Entering a description is optional.   Let's enter
one.   Click the mouse in the description box and
type:

SAMPLE SESSION 1(CR)

Click the mouse in the ALL POINTS command box to
tell TIPS that you are happy with the name and
description and wish to save the session.   The
entire route and all Form 691 parameters are
automatically saved.

Figure II.1-5   SAVE Menu

The second time you save the route in a TIPS
session, the identifier and description of the
previously saved session are displayed.   If you do
not change the name of the record and then you
save, the old record will be overwritten with the
new record.   This allows the user to easily save
routes during a session without having to delete
the old record.   If a new name is typed in, it will

keep the old record under the old name and save the new record under the new name.

12.   We will now review the Combat Mission Folder (CMF). TIPS produces CMF output roughly in accordance with USAFR 55-125. To review the CMF, we go to the Combat Mission Folder Review (CMFR) menu. Position the cursor in the CMF REVIEW command box on the RGEN menu and click the mouse. The CMFR menu with a picture of the entire route is displayed (Figure II.1-6).
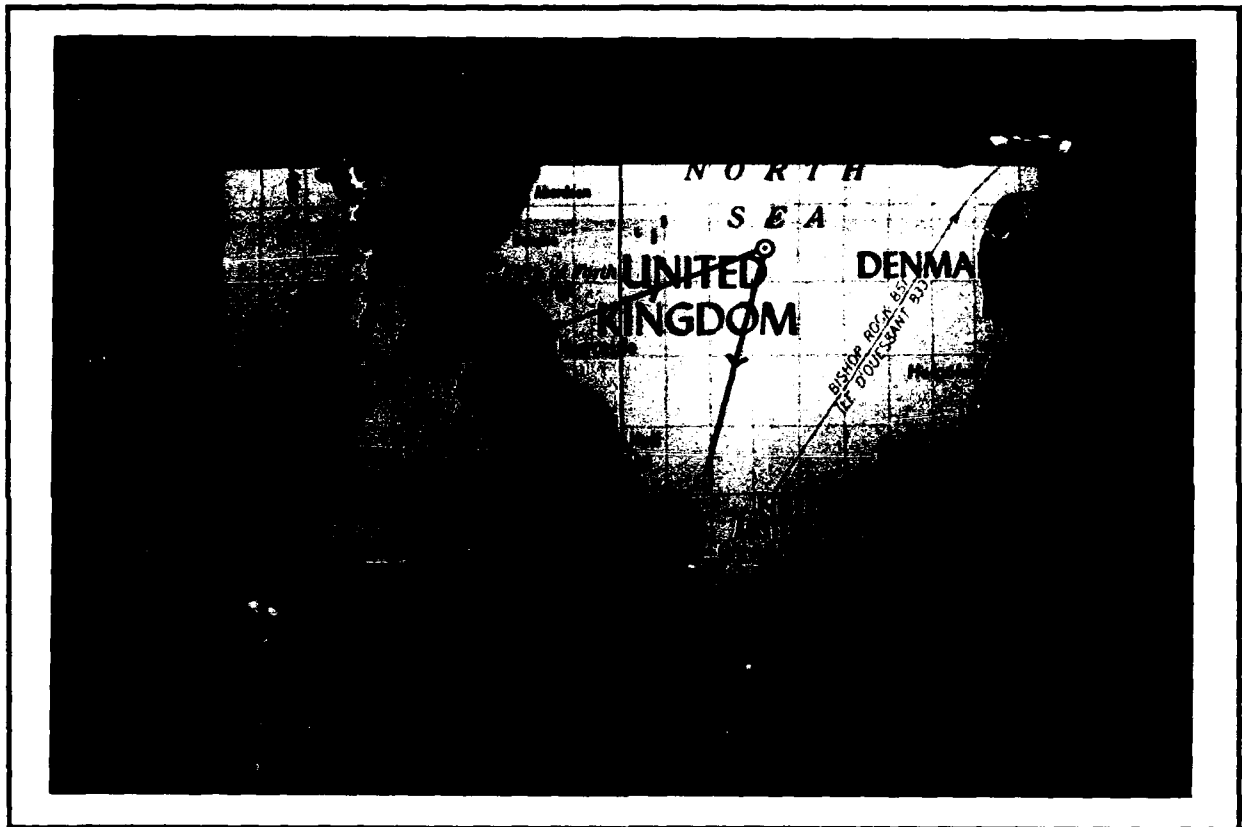
Figure II.1-6   CMFR Menu Displaying Entire Route

<u>Print the picture of the entire route</u>. Position the cursor on the PRINT CMF command box and click the mouse, then press the CAPTURE button on the Graftel printer interface. Wait until the red light goes off on the CAPTURE button before doing anything else on TIPS (about 10 seconds).

The CMFR menu allows the user to produce strip maps of the route that can be taken aboard the aircraft for in-flight use. TIPS creates a map of the total route and one for each leg(s). The total route is displayed when the CMFR menu is first displayed. By clicking the mouse on the NEXT PAGE command box,

you will be able to see the picture of the first
leg(s). Clicking the mouse on the NEXT PAGE
command box again, produces the next leg(s), and so
on.

TIPS permits you to move the doghouses, which can
be useful if they cover up areas of interest. TIPS
will center the doghouse on the map where you
placed the cursor. To see how to move the
doghouse, display any one of the legs of your
route. Click the mouse on the MOVE OBJECT command
box and follow the prompts. The doghouse will be
moved to the new location. Waypoint IDs and the
lower portion of the doghouse may be moved in the
same manner.

Note that once you display one of the legs, you
cannot go back to the display of the entire route.
The only way to redisplay the entire route is to go
out of the CMFR menu (DONE) and then get back in
(select CMF REVIEW on the MAIN menu).

Pick up the print-out of the total route. You can
use it to follow along while displaying the legs.

Figure II.1-7   CMFR Menu Displaying Portion of Route

13.   <u>Print the pictures of the legs of the route</u> we just
      created.   First, click the mouse on the SELECT
      STARTING PT. command box, and then type the
      following:

      1(CR)

      It takes about two minutes to rotate the map.

      This will display the leg(s) of the route starting
      at waypoint 1 and more if there is room (Figure
      II.1-7).   Position the cursor on the PRINT CMF
      command box and click the mouse, then press the
      CAPTURE button on the Graftel printer interface.
      When the red CAPTURE light goes out, you may print
      the other legs of the route in the same way: Click
      the mouse on the NEXT PAGE command box, click the
      mouse on the PRINT CMF command box then press the
      CAPTURE button on the Graftel printer interface.
      Wait until the red CAPTURE light goes out.   You may
      print as many pages as desired.

14.   Next, we will <u>print the Form 691</u> for the route we
      created.   This is done from the RGEN menu.   Since
      you are still in the CMFR menu, position the cursor
      on the ROUTE GENERATION command box and click the
      mouse.   In the RGEN menu, position the cursor in
      the PRINT 691 command box and click the mouse.   The
      Form 691 output prints immediately on the line
      printer (Figure II.1-8).

      Next, <u>print out another Form 691</u>, but this time
      change the DMS command box (degrees-minutes-
      seconds) to DM (degrees-minutes).   To do this,
      position the cursor on the DMS command box and
      click the mouse.   This is a four-way toggle switch
      that will toggle to the DM format on the first
      click.   Next click the mouse on the PRINT 691
      command box on the RGEN menu.   Pick up your output
      at the line printer.

      We now have our CMF material that contains the CMF
      maps of the total route, and of the desired legs,
      and a Form 691 for the route in two formats.

15.   <u>Exit TIPS</u>.   To do this, position the cursor on the
      DONE command box in the RGEN menu and click the
      mouse.   The MAIN menu is now displayed.   Position
      the cursor on the QUIT command box on the MAIN menu
      and click the mouse.   TIPS will ask if you really
      want to quit the program without saving the route.
      It is ok to quit.   Type the following to answer YES
      to the query:

Y(CR)

You should now be out of the TIPS program and you
can exit the VAX operating system by typing:

LOGOFF(CR)

23-AUG-88 11:12:02

ID	CHECKPOINT	RMKS	MC VAR	DIST GS	ETE TOTAL TIME	ETA ATA	FUEL REM
MAR3	52-15-00N		360	0.0	00+10:00		4.6
	002-30-06W		0E	0	00+10:00		27.4
1	55-19-17N		016	187.2	00+24:22		4.2
	001-34-00W		6W	461	00+34:22		23.2
	NTP (24)						
	179/012						
2	56-24-32N		070	175.4	00+21:13		3.6
	003-16-17E		4W	496	00+55:34		19.7
3	53-09-19N		198	201.0	00+27:23		4.6
	001-53-34E		4W	440	01+22:57		15.1
UPHA	51-56-16N	RECOVERY	244	136.2	00+26:30		2.8
	001-15-30W		5W	308	01+49:28		12.3
	UPHA						

Figure II.1-8 Form 691 Printout

II.2 WARTIME SAMPLE SESSION

In this sample session, we will construct a wartime route that goes to a target at Dresden, at an altitude of 2,000 feet, with an airspeed of 450 knots, and with winds of 80 knots coming from the west (270 degrees). The temperature is -25 degrees Celsius. All other values are the default values in TIPS. They are already set and need not be reentered.

The following is a summary of the steps in this sample session. The numbers correspond to the numbers in the sample session.

1.	Log on to the computer
2.	Run TIPS
3,4,5,6,	Input values into the INIT menu
7,8,9.	
10.	Go to the Route Generation (RGEN) menu
11.	Change the scale
12,13,14	Create route graphically
15,16.	
17.	Review
18.	Display leg
19,20,21.	Make a Radar Prediction
22.	Print route and legs
23.	Exit TIPS

1. Log on to the computer. Ask your system administrator for the log on procedure.

2. Run TIPS by typing:

    TIPS(CR)

    The program logo is displayed.

3. To proceed to the first menu, use the mouse to position the cursor in the CONTINUE command box (or anywhere on the display) and click the mouse. The Initial Planning (INIT) menu is displayed (Figure II.1-1).

4. Toggle the PEACE option to WAR. To do this, position the cursor on the PEACE command box and click the mouse. The PEACE command box should now say WAR (it's now the WAR command box).

5.   <u>Change the target to Dresden</u>. Position the cursor
     in the TARGET command box, click on the mouse and
     type:

     5109N 1331E(CR)

6.   <u>Change the altitude to 2,000 feet</u>. Position the
     cursor in the ALTITUDE command box, click the mouse
     and type:

     2000(CR)

7.   <u>Change the airspeed to 450 knots</u>. Position the
     cursor in the upper TAS/GS command box, click the
     mouse and type:

     450(CR)

8.   <u>Change the winds to 270 degrees at 80 knots</u>.
     Position the cursor in the WINDS command box, click
     the mouse and type:

     270/80(CR)

9.   <u>Change the temperature to -25 degrees Celsius</u>.
     Position the cursor in the TEMP command box, click
     the mouse and type:

     -25C(CR)

     The "C" for Celsius is optional because TIPS will
     assume Celsius unless you specify "F" for
     Fahrenheit.

10. <u>Go to the Route Generation (RGEN) menu</u>. Position
     the cursor in the DONE command box on the INIT menu
     and click the mouse. The MAIN menu is then
     displayed (Figure II.1-3). Position the cursor in
     the ROUTE command box and click the mouse. The
     RGEN menu is then displayed (Figure II.1-4).

11. <u>Obtain a small-scale video map</u>. Obtain a 1:500,000
     scale map so that you can accurately position the
     initial point (IP). Position the cursor on the
     SMALL=1:500 command box and click the mouse. This
     command box is three boxes to the right of the TEXT
     INSERT box. You are prompted to position the
     cursor at the location you wish to be the center of
     the map. Position the cursor at a location near
     Dresden and click the mouse. The new map with the
     new scale and new centerpoint is displayed.

Now recenter the map so that the whole route or as much of the route as possible is displayed and so that the target is in view. To do this position the cursor on the PAN (CENTER) box and click the mouse. You will be prompted to place the cursor at the desired center. Center it in a position that will show the target and most of the route. Next click the mouse. The same map scale 1:500,000 is displayed with the new centerpoint.

12.   Insert an Initial Point (IP) into the route. The Initial Point is a 'special point' and can be inserted into the route using the SPECIAL POINTS command box on the RGEN menu. Position the cursor on the SPECIAL POINTS command box and click the mouse. The SPPT (Special Point) menu is then displayed (Figure II.2-1). Click the mouse on the IP (MOUSE) command box, then use the mouse to position the cursor at the location on the map where you want the IP and click the mouse. The IP you just inserted is now the selected waypoint.
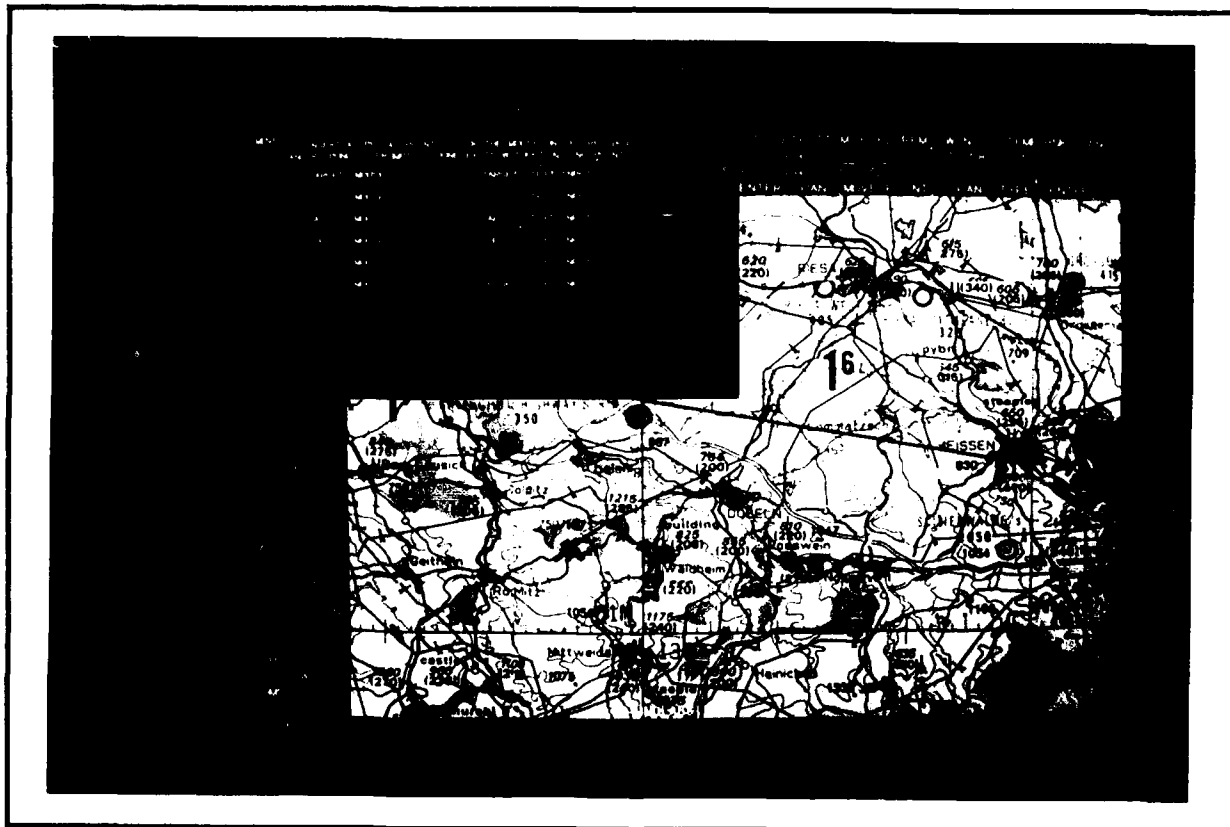

Figure II.2-1   Special Point (SPPT) Menu

13.   Select the previous point. Position the cursor on the PREVIOUS POINT command box on the RGEN menu and click the mouse. The waypoint before the IP is now

the selected waypoint. In this example, the
selected waypoint should be the base.

14. Optimize one leg of the route. Optimization
     creates the best path from the selected waypoint to
     the next waypoint. The path is best in that it
     follows the minimum danger path on the hostile side
     of the IFF-ON line, and follows the transit
     corridor (TCOR) route and low level transit route
     (LLTR) on the friendly side of the IFF-ON line.

     We will optimize the leg between the take-off base
     and the IP. The take-off base is the selected
     waypoint on the route we are working on. If we
     optimize now, the leg between the take-off base and
     the next point, the IP, will be optimized.
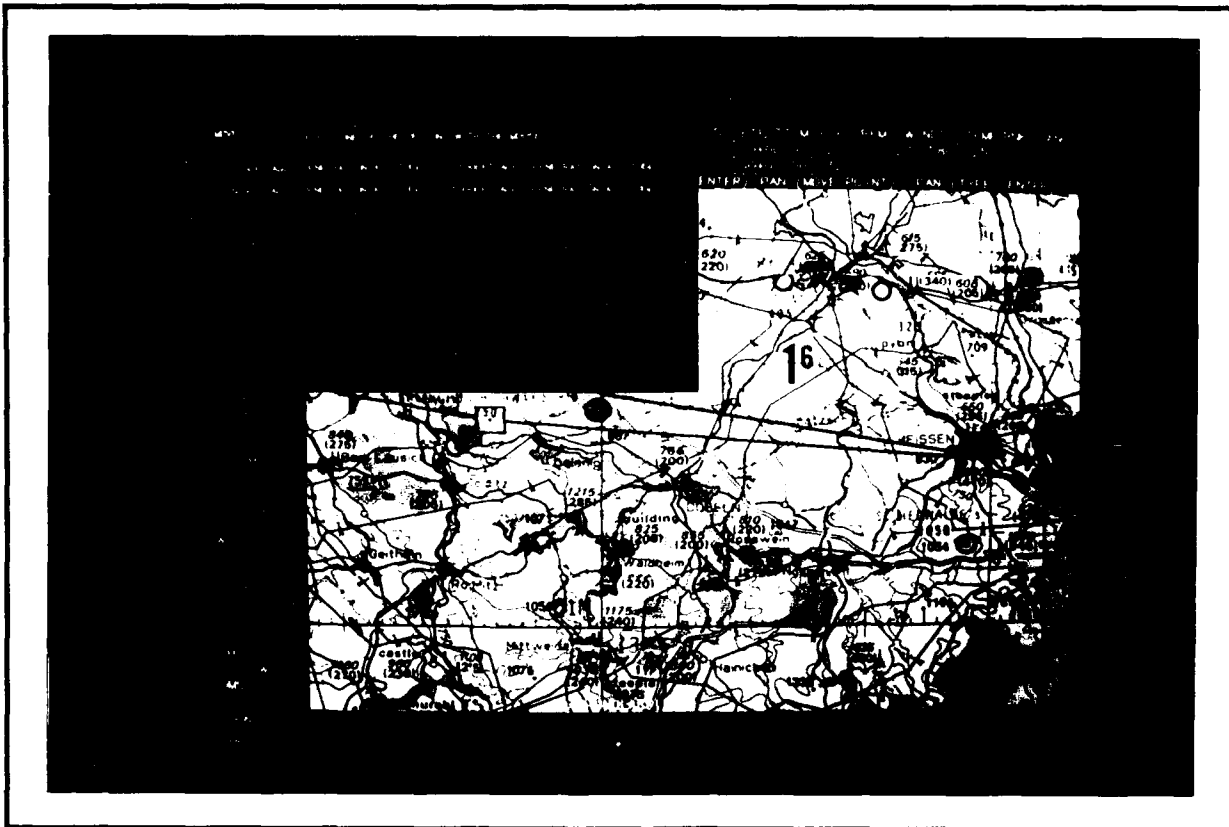

Figure II.2-2   LIST Menu Displaying Altitudes

     Position the cursor on the OPTIMIZE ROUTE command
     box, then click the mouse. TIPS will optimize the
     route. If any part of the route being optimized is
     in the hostile area (as will occur in this
     example), the LIST menu will be displayed and
     prompt you to choose a penetration altitude above
     ground level (Figure II.2-2). The TIPS data base
     contains the danger to the aircraft at (usually

four) different altitudes and the user must specify one of the altitudes to be used. The altitude chosen will only apply to the parts of the route that overfly hostile areas. When the LIST menu is displayed, click the mouse in the box labeled 200 (If you were to choose DONE, the optimization would be cancelled). The LIST menu disappears and the RGEN menu is again active. It will take a few seconds to optimize and then the new route will be displayed. The selected waypoint is now the waypoint before the IP.

15. <u>Select the target</u>. Position the cursor on the NEXT POINT command box and click the mouse twice (the first time to select the IP; a second time to select the target). NEXT POINT selects the next waypoint, which in this case is the target.

16. <u>Optimize the egress route</u>. Since the target is the selected waypoint, and the next waypoint is the recovery base, choosing the OPTIMIZE ROUTE command now will optimize the entire egress route, from target to recovery base. Position the cursor on the OPTIMIZE ROUTE command box and click the mouse. The LIST menu is displayed and prompts you to select an altitude. Click the mouse in the box labeled 200 feet. The LIST menu disappears and in a few seconds you will have an optimized route. The selected waypoint is now the waypoint preceding the recovery base.

17. <u>Review the combat mission folder</u>. Next, we might want to go into the CMFR (combat mission folder review) menu (Figure II.1-6) to look at and print out the route. To do this from the RGEN menu (which we are now in), position the cursor on the CMF REVIEW command box and click the mouse. The CMFR menu will then display a picture of the entire route.

18. <u>Pick a leg on the route to display</u>. The SELECT STARTING POINT command box enables the user to display individual legs on the route. The user specifies a starting point (LAT/LON or ID) in response to the SELECT STARTING POINT command box query. The point specified, the leg after the specified point and as much of the subsequent legs as can fit will be displayed.

Position the cursor on the SELECT STARTING POINT command box and click the mouse. A message will tell you to enter a Leg ID. Type the following:

IP(CR)

The leg leading to the target (and as much of the
next leg as can fit) will then be displayed (Figure
II.1-7 shows a leg on the route).

19.   <u>Go to the Radar Prediction menu</u>.   Position the
      cursor on the RADAR PREDICTION command box and
      click the mouse.   The user is prompted to select a
      crosshair point.   Click the mouse somewhere near
      the target.   The RADR (Radar Prediction) menu is
      then displayed.   The graphics area remains blank
      until the DRAW PREDICTION command box is selected.

      The Radar Prediction menu has 20 selectable
      parameters that control radar prediction output.
      The parameters and values are displayed on the top
      lines of the RADR menu.   When the menu is first
      displayed during a run, the 20 parameters are
      filled in with default values.   The user may reset
      these values by clicking the mouse on the
      appropriate box and typing in the new value.   In
      most cases, however, the default values are the
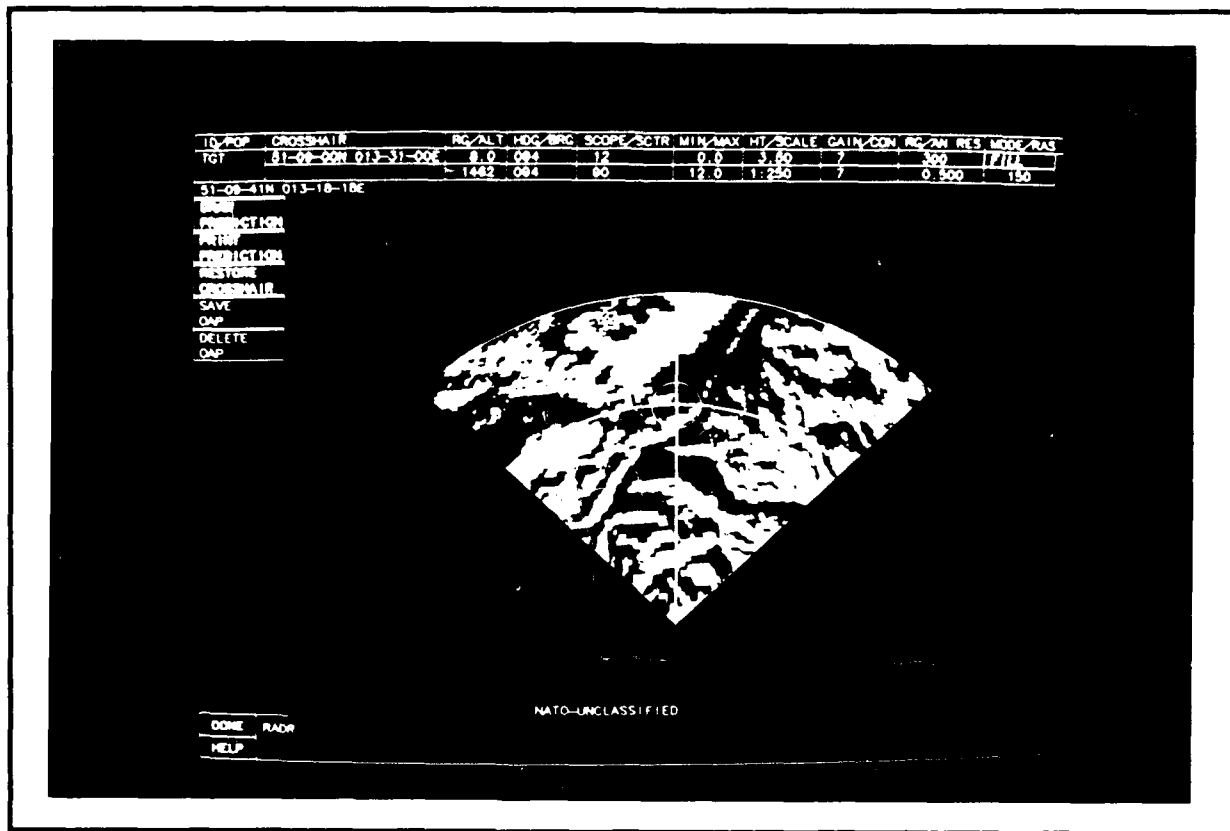   "normal" values and there is usually no need to
      reset them.

Figure II.2-3   Radar Prediction (RADR) Menu

20. <u>Draw a radar prediction</u>. Position the cursor on
     the DRAW PREDICTION command box and click the
     mouse.   The radar prediction will then be
     calculated and displayed (Figure II.2-3).

21. <u>Print the radar prediction</u>. Position the cursor on
     the PRINT PREDICTION command box and click the
     mouse, then press the CAPTURE button on the Graftel
     printer interface. When the red CAPTURE light goes
     out (in about 10 seconds), you can resume using
     TIPS. It will take a little while longer for your
     printout to be ready.

22. <u>Print CMF</u>. First exit the RADR menu. To do this,
     position the cursor on the DONE command box and
     click the mouse. The CMFR menu will be displayed.
     On the CMFR menu, position the cursor on the PRINT
     CMF command box and click the mouse. Then push the
     CAPTURE button on the Graftel printer interface.
     This must be done for all CMF pages you print out
     (i.e.; select NEXT PAGE, select the PRINT CMF
     command box, and press CAPTURE on the Graftel
     printer interface). Print out a few pages. When
     they are all printed, pick up your printouts.

23. <u>Exit TIPS</u>. To do this, position the cursor on the
     DONE command box in the CMFR menu and click the
     mouse. The MAIN menu is now displayed (Figure
     II.1-3). Position the cursor on the QUIT command
     box on the MAIN menu and click the mouse. TIPS
     will ask if you really want to quit the program
     without saving the route. It is ok to quit. Type
     the following to answer YES to the query:

     Y(CR)

     You should now be out of the TIPS program and you
     can exit the VAX operating system by typing:

     LOGOFF(CR)

SECTION III

ABOUT TIPS

III.1 TIPS HARDWARE

The TIPS hardware consists of the following components
which are shown in a flow chart in Figure III.1-1:

1.   Microvax computer - The computer system that runs
the TIPS program.

2.   Graphics Terminal - Menus, video maps and graphics
are displayed on this terminal; in other words, the entire TIPS
output except for the Form 691, which is displayed on the
textual terminal is displayed here.   The graphics terminal is
an Ikegami DM-2060.

3.   Text Terminal - This is where the user logs on to
the Microvax computer and the TIPS program. Other than being
used for logon, this terminal has two other functions; to
display the Form 691 lines and to display HELP on the menu and
command boxes. The text terminal displays the current Form 691
line (the Form 691 line of the selected waypoint) and the Form
691 line of points before and after the selected waypoint if
available. Help is invoked on the graphics terminal but is
displayed on the text terminal.

4.   Keyboard - the keyboard is attached directly to the
textual terminal where the user logs on to the Microvax
computer and gives the command to run the TIPS program. After
TIPS is running, all user interface is done with the keyboard
and the graphics terminal.

5.   Mouse - The mouse is used with the graphics
terminal. It is used in the TIPS program to control graphics
input and to input menu responses.

6.   Versatec Printer - This printer enables the user to
produce hardcopy color prints of TIPS screen displays.

7.   Graftel printer interface - This printer interface
"captures" the screen image, saves it and then prints the
captured image. This is a benefit to the user because instead

of having to wait for the image to print before being able to
continue on with the program, the Graftel interface saves that
image before printing, allowing the user to continue using the
program with only a minimal waiting period (nominally about 10
seconds).   The Graftel printer interface will also
automatically expand the printed image.

  8.   Digital (DEC) LA-210 Line Printer - Form 691 output
is printed on this device.   The Form 691 will fit on 80
character-wide paper.

  9.   Sony Video Disc Player - The map video discs are
"read" from this device, permitting TIPS to display map
backgrounds for assistance in planning and for CMF output.

  10.   Parallax Board - additional hardware placed in the
Microvax that takes the video disk images and digitizes them.
This enables the map frames to be put together in mosaic form
(several map fragments "pasted" together to form one map),
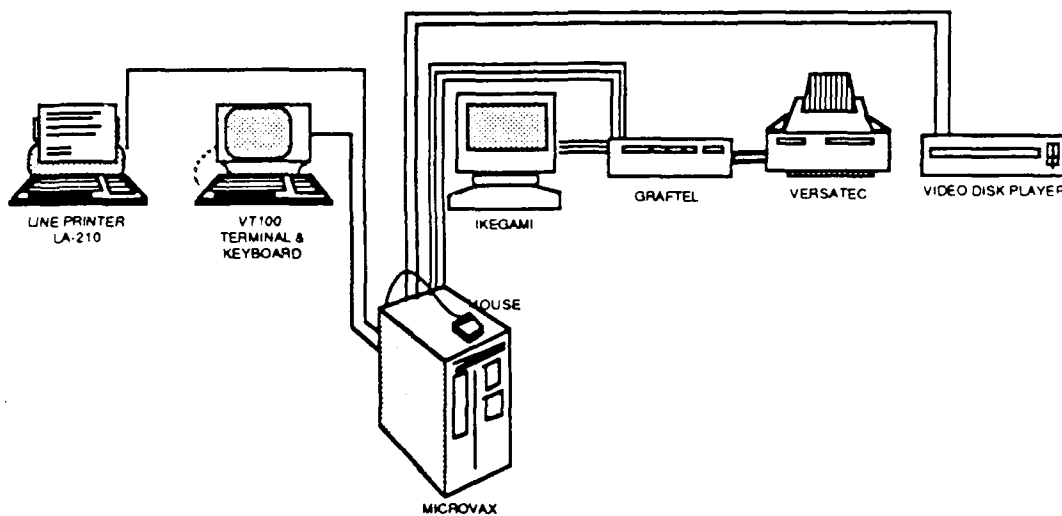rotated, expanded and reduced in size.

Figure III.1-1   TIPS Hardware

III.1.1   Using TIPS Hardware

  Instructions on how to switch the hardware devices on and
how to refill paper and ink on the Versatec printer are
summarized in the TIPS Data Base Administrator's Manual/Data
Base Specification.   Complete instructions on hardware use and
maintenance may of course be found in the manuals that come
with each device (see the References section in this manual).

III.2   MENUS

  The TIPS program is menu-driven.   Menus are screen-size
or quarter-screen-size displays that provide the user with a
selection of commands, toggles or textual input lines from

which to make a selection. All menus branch to other menus.
Figure III.2-1 shows the tree-like structure of the TIPS menus.
The INIT menu is the first menu displayed. While in the INIT
menu the user may, depending on the input the user gives,
branch to the LIST menu. When the user is finished with the
INIT menu (i.e., when the DONE command is selected from the
INIT menu), TIPS will then display the MAIN menu. From the
MAIN menu, several other menus are accessible. The user can
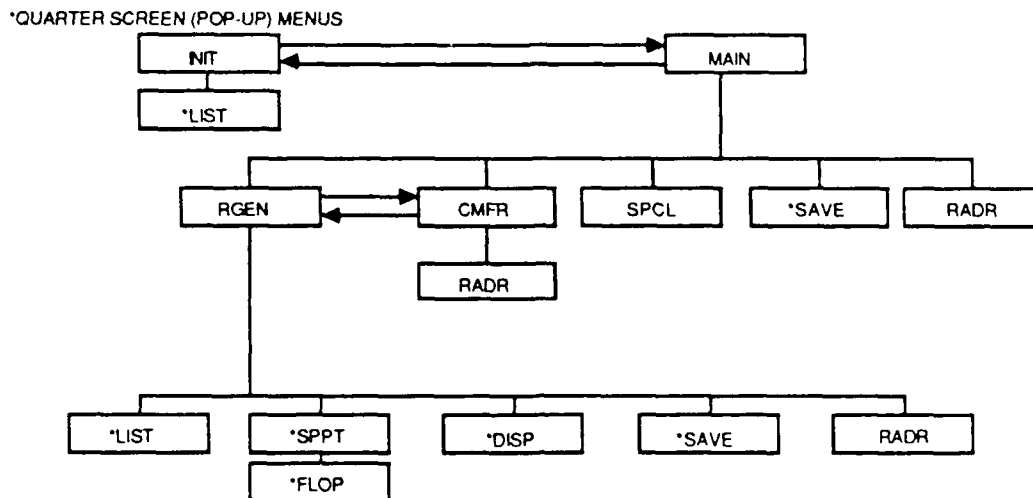also go back to the INIT menu or exit TIPS.

Figure III.2-1   Menu Hierarchy

     All menus are made up of four-letter names that are
closely related to the function of the menu. For example, the
INIT menu initializes TIPS; the MAIN menu branches to all of
the main TIPS functions (as well as exiting the program); the
RGEN menu generates the TIPS routes; the LIST menu displays
lists; and the DISP menu turns on and off the map displays.
The name of the current menu is displayed on the bottom of the
screen next to the prompt area.

III.2.1 Types of Menus

     There are three different types of TIPS menus; Normal,
Graphic and Quarter-screen menus.

Normal Menus

     Normal menus cover the entire screen. They have two or
more command boxes from which the user may make a selection.
The command boxes are displayed in the center of the screen.
These types of menus do not display graphics. The INIT
(Initialization) menu (Figure V.1-1) is an example of a normal
menu.

Graphic Menus

     Graphic menus display TIPS graphics, that is, video maps,
routes, threats, radar prediction, doghouses etc. Graphic
menus cover the entire screen. The command boxes are located
around the edge of the display so that the graphics may be
displayed in the center of the screen. The RGEN (Route
Generation) menu (Figure V.2-1) is an example of a Graphic
menu.

Quarter-screen Menus

     Quarter-screen menus cover one quarter of the screen.
They are displayed on top of a Normal or Graphic menu. The
user may move the quarter-screen menu to any of the three other
quarters of the screen if for example it covers up the graphics
at a critical point. Moving the quarter-screen menu is
accomplished by clicking the mouse on the MOVE box on the
Quarter-screen menu. The MOVE box is discussed in a separate
subsection below. Quarter-screen menus may ask you to select
from two or more command boxes and some Quarter-screen menus
allow the user to search through a list using the "elevator"
(as described in a following section). The HELP and DONE boxes
for Quarter-screen menus are not located on the Quarter-screen
menu, but are located on the bottom of the menu that is
overlayed. The LIST menu (Figure III.2.2-1) is an example of a
Quarter-screen menu.

III.2.2 User Interface

     Depending upon the particular menu, the user may respond
to the menu by using any of the following techniques: by using
the mouse to select command boxes; by typing new data into the
command boxes; by toggling the alternate choices in the
command boxes; and/or by selecting map locations (graphically)
with the mouse. These interface procedures and the use of the
menus are discussed below.

Commands and Command Boxes

     All menus contain Command boxes. Commands (or values or
blanks) are written inside command boxes and may or may not be
associated with a description. Command boxes are rectangular
areas of the screen the user selects by using the mouse to
position the cursor inside the desired command box and then
clicking the mouse. Some commands require the user to enter
text, others perform some task immediately or toggle to another
command and others display a menu or prompt that tell the user
what to do next.

     Command boxes are color-coded in order to allow the user
to distinguish the type of command box with respect to its
function in the menu. The list of colors and what they mean is
described below:

BLUE Command Boxes:

> The blue command boxes are the most frequently
> encountered. When selected, these command boxes issue
> one or more prompts which tell the user to type or move
> the mouse, or display another menu, or perform some task
> immediately after being chosen.

RED Command Boxes:

> These command boxes have two or more toggle selections.
> The WAR/PEACE command box on the INIT menu is an example
> of a toggle command box. When WAR is displayed in the
> command box, and the user clicks on the box, then PEACE
> is displayed, and vice versa. When using command boxes,
> the user should click the command box with the mouse
> until the desired command is displayed.

GREEN Command Boxes

> The HELP and DONE options are displayed in the green
> boxes on the bottom left hand side of the screen.
> These options are found on all menus. Selecting the
> HELP command box gives the user help on the menu and
> on a desired option. On most menus, selecting the DONE
> option branches the user to the next menu. The HELP and
> DONE boxes are explained in this section.

> The MOVE box on quarter-screen menus that moves the
> menu to a different quadrant of the screen and the UP,
> DOWN and elevator boxes on the LIST menu that aid in
> searching through long lists are green boxes. All are
> described in detail in this section.

BLACK Command Boxes:

> Black boxes may not be selected. They are informative
> only and issue a 'beep' if the user tries to select
> them. At times a command may be non-selectable and at
> other times the same command may be selectable. For
> example, in the RGEN menu, if an Offset Aim Point (OAP)
> has been inserted, the TRUE AIRSPEED command box (upper
> TS/GS command box) would be non-selectable, but if a
> regular waypoint has been inserted, the same command
> box would be selectable.

Mouse

> The mouse is a hardware device used to move the cursor to
different positions on the screen. It is used to select
command boxes and to input graphics. To select a command box,
simply use the mouse to position the cursor (look at the screen
to see how the mouse controls the position of the cursor) into

the box you are selecting and press one of the buttons (any
one) on the mouse.

Prompts

     The prompt area is located near the bottom of the screen
to the right of the DONE box and the menu name. It is on all
menus. Prompt lines appear in this area to tell the user what
action to perform on the current menu, either what to do with
the mouse or what type of information to type on the keyboard.

Messages

     Messages are displayed on the line near the bottom of the
screen to the right of the HELP command box. Any menu may
display a message. Messages are displayed when necessary to
give the user information about the program. There are four
types of messages in TIPS: Warning, Error, Informative and
Debug. Warning messages issue a warning to the user, but
processing continues. Error messages are more severe than
Warning messages. With Error messages, TIPS processing stops
and the user must perform some action in order for processing
to continue. Informative messages are messages intended to be
of help to the user. Debug messages are of interest to
programmers.

     If more than one message needs to be displayed, the end
of the prompt area will display the following: "more...hit
<return>." When the carriage return key is hit, the next
message will be displayed, (etc.).

Help

     The HELP command box (green) is displayed on all menus on
the bottom left hand side below the DONE key. Although the HELP
command box is on the graphics screen, help itself is displayed
on the textual screen.

     HELP may be invoked from a menu by selecting the HELP
command box with the mouse or HELP may be invoked while the
user is in the process of using a command, that is, while a
prompt is being displayed on the prompt line, by clicking the
mouse on the help box (graphics prompts) or by typing 'HELP' or
'?' followed by a carriage return (textual prompts).

     When no commands are active (no prompts are displayed)
and the HELP command box is invoked, the textual terminal will
display the following information:

     a)   purpose of the menu
     b)   description of graphic input
     c)   effect of selecting the DONE command for the menu
     d)   other information about the menu
     e)   if the menu is a quarter-size menu, a description

of the move button will be provided
   f)   if the menu is a multi-page list, a description of
        the use of the elevator will be provided

When HELP is invoked while a command is active (while a prompt is displayed) the textual terminal will display the following information:

   a)   purpose of the command
   b)   input format for the command
   c)   other information about the command

After HELP is invoked, the appropriate help is displayed immediately on the textual screen.   The user is then prompted from the text screen to click the mouse on any one of the command boxes on the menu (whether that command is selectable or not) for help on that command, or to click the mouse on the HELP box for general menu help, or to click the mouse on the DONE box to exit help.

If more than one page of HELP needs to be displayed, the textual screen will issue a message at the bottom of the HELP that says "MORE...HIT<RETURN>".

Textual Input

Textual input is required when some command boxes are chosen.   After choosing a prompt requiring textual input, the user is prompted to enter text such as a LAT/LON, amount of fuel or base name.   The cursor remains in the command box ready for the text to be typed.

The user enters text on the keyboard, it is echoed (i.e., it appears) in the command box.   After the text is entered, the user must type a carriage return in order for TIPS to accept the input.   Another command may then be selected.

Defaults

The graphic menus (RGEN and RADR) both have a graphic input default.   The graphic input default is the action that clicking the mouse performs when you are in the RGEN or RADR menus and no commands are active (the first time you enter a menu or just after a command has been completed).

The graphic default mode for the RGEN menu is to insert waypoints. This means that when no commands are active on the RGEN menu and you click the mouse on the screen, a waypoint will be inserted into the route.   It will be inserted after the selected waypoint, at the current mouse (cursor) location.

The graphic default mode for the RADR menu changes the crosshair location.   The area of prediction remains the same.

When no commands are active on the RADR menu and a radar
prediction has been drawn and you click the mouse on the
display, the crosshair location will move to the location of
the cursor.

LIST Menus

        LIST menus (Figure III.2.2-1 shows a LIST menu) are
quarter-screen menus that are displayed when the user is in one
of six possible situations requiring a choice to be made:

        1)   When the user is in the INIT menu and enters an
incorrect entry (or any non-blank character) for the take-off
base.

        2)   When the user is in the INIT menu and enters an
incorrect entry (or any non-blank character) for the recovery
base.

        3)   When the user is in the INIT menu and enters an
incorrect entry (or any non-blank character) for the SCL.

        4)   When the user is in the INIT or RGEN menu and enters
an incorrect entry (or any non-blank character) for the session
to be retrieved or route to be recalled.

        5)   When the user is in the RGEN menu optimizing and all
or part of the route being optimized is in hostile territory,
TIPS needs the user to choose an altitude at which to fly the
optimal route.

        6)   When the user is in the RGEN menu selecting, a point
and two or more points have the exact same geographical
location, TIPS needs the user to specify the desired point.

        In the first three cases, when the user selects one of
the items in the list, the LIST menu will disappear and that
item will be displayed in the box on the previous menu. In the
other cases, an action occurs immediately after a list item is
selected. In any of the cases, choosing DONE exits the LIST
menu without doing anything.

        Normally (in the first four cases) the LIST menu is
displayed after the user has typed in an incorrect entry,
however the user may initiate the display of the LIST menu by
simply typing in any non-blank character such as "X" after
selecting TAKE OFF BASE, RECOVERY BASE, SCL or RETRIEVE
PLANNING SESSION in the INIT Menu, or RECALL ROUTE in the RGEN
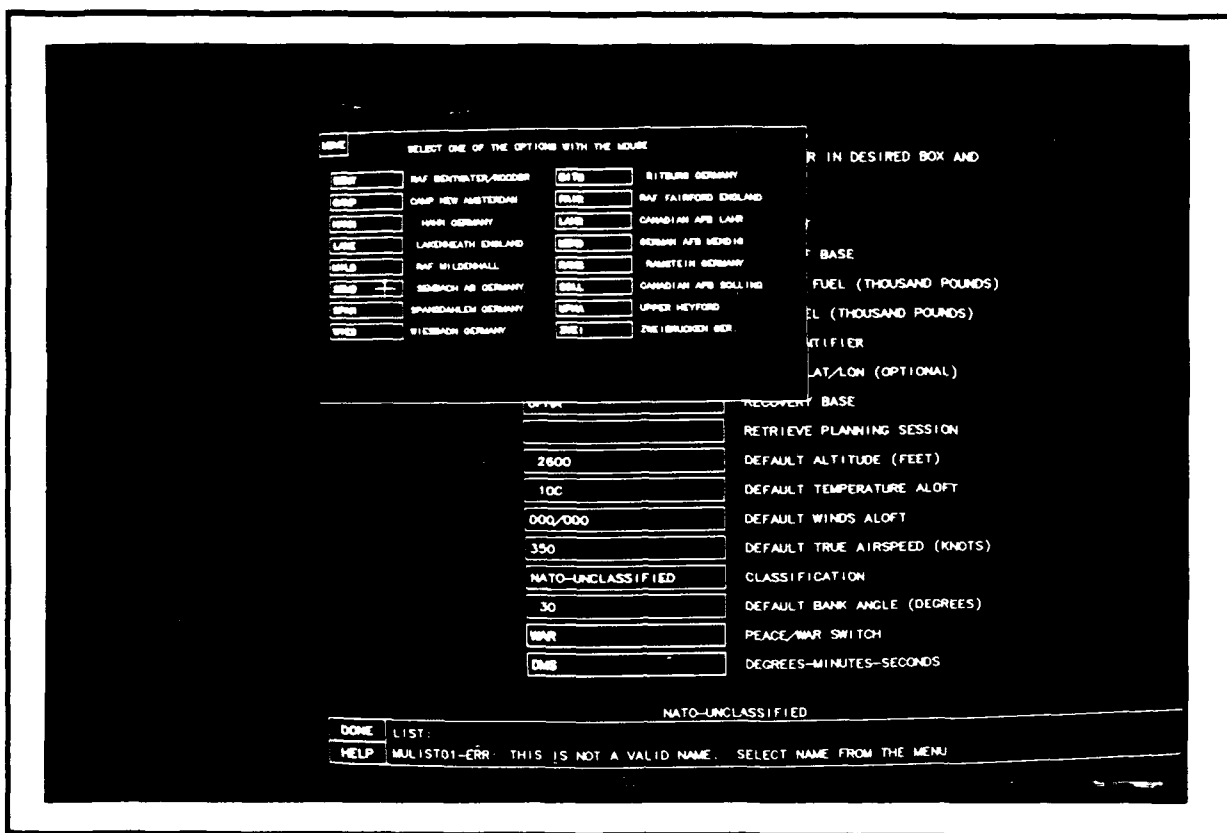Menu.

Figure III.2.2-1   LIST Menu

Elevator

The LIST menus have a special feature to aid the user in searching through long lists. This feature is called an ELEVATOR. It is located on the right-hand side of the LIST menus. There is a box on top that says "UP," which scrolls to the previous page, and a box on the bottom that says "DOWN," which scrolls forward one page. In between the UP and DOWN boxes, are printed selected item names from the alphabetized list. If, for example, the list was made up of 100 items, the elevator would have 10 names (every tenth item). By clicking anywhere in the elevator area, (e.g., one third of the way down) the LIST menu will display the referenced portion of the list (i.e., the item that was one third of the way down is now the first item on the list). The UP/DOWN boxes and the indexed names greatly expedite the task of searching long lists. Figure III.2.2-1 shows a LIST menu with the elevator feature.

Move

The MOVE feature is on all quarter-screen menus. It is a box located in the upper-left-hand side of the menu that moves the menu to another quarter of the screen. This is useful when you wish to see something underneath the quarter-screen menu such as a portion of the video display. The menu moves

counter-clockwise to the different quarters of the screen with each "click" of the mouse in the MOVE box. Figure III.2.2-1 shows a quarter-screen menu with a MOVE box.

Scaling Boxes

        The scaling command boxes are found on the Route Generation (RGEN) menu. They are located to the right of the TEXT INSERT command box. There are six command boxes associated with panning and zooming (scale (toggle), BIG =, SMALL =, PAN (CENTER), PAN (MOVE POINT) and PAN (TYPE CENTER)).

        The scaling commands enable the user to change the scale, set a big scale and a small scale, and move the map (pan) either textually or graphically. These commands allow the user to quickly switch between scales. The scaling options on the RGEN menu are described along with descriptions of other RGEN menu options in Section V.

        It is noteworthy to point out that when the RGEN menus are first displayed, and if there is an entry for the target in the INIT menu, the map scale is the smallest scale necessary to display the entire route; however, if there is no target, the map scale is the largest scale, 1:30M (30 million).

Done

        In all menus the *DONE* command box is located in the bottom left-hand corner of the screen, above the HELP key. The done command box on some menus means that you are finished with the menu you are working on and want to go on to the next menu (the INIT menu for example), or in some menus, DONE means that you want to cancel what you have done on this menu and go back to the previous menu (the DISP menu, for example). The DONE command box on the MAIN menu is non-functional.

        HELP on a menu contains HELP for the DONE command box for that menu. To receive help for the DONE command, click the mouse on the HELP command box.

SECTION IV

INPUT

IV.1 DUTIES OF THE DATA BASE ADMINISTRATOR

This manual is directed to the mission planners. Running
TIPS however, depends on both mission planners and the data
base administrator who has the task of setting up the data base
that TIPS uses.

The TIPS data base administrator uses the TIPSDB program
to maintain the TIPS data base files. Maintaining the TIPS
files consists of entering data into files in a format that can
be read by the TIPSDB and SUPR pr᾿ᴉrams and running TIPSDB and
SUPR to process that data.

Before using the TIPS system, mission planners should
check with the data base administrator to make sure the TIPS
files have been updated and processed. There are 30 TIPS files
that are used when running TIPS whether running in the wartime
or peacetime mode. Although it is necessary that all files be
opened in order for TIPS to run, some files are used only for
the wartime mode and others are used in the wartime or
peacetime mode. Most of the data base files that need to be
updated frequently are those used when running TIPS in the
wartime mode. Below is a list of all TIPS files, the mode they
are used in (W=wartime, P/W=peacetime and wartime) and if they
are a stable file that is never or rarely updated (F=fixed) or
a file that needs frequent updates (V=variable).

Table IV.1-1   TIPS Tables

FILE	MODE	TYPE	FILE	MODE	TYPE
ALGP	W	V	ASTR	P/W	F
BASE	P/W	F	BYTE	P/W	F
CHUM	P/W	V	CORR	W	V
CURR	W	F	CURS	W	F
CURT	P/W	V	FEAT	W	V
FLOT	W	V	FTYP	W	V
HFIL	P/W	F	LLTR	W	V
MAS1	W	V	MENUOUT	P/W	F
MIKE	W	F	NLIS	W	V
NODP	W	V	PNTS	P/W	F
RSEG	P/W	V	SCL	P/W	F
SESS	P/W	V	SWCH	W	F
THRT	W	V	TMDL	W	F
TSTR	P/W	F	TREE	W	V
VMAP	P/W	F	ZINIT	P/W	V

IV.2 Video Disks

There are two sources of laser disks containing the video maps which the user has access to. These disks are the DMA disk and the ITC custom disk. The DMA disk contains maps primarily of Western and Central Europe in scales ranging from 1:30 million to 1:50,000. The map names and scales contained on the DMA laser disk are listed below:

Map 1145 (1:30,000,000)(entire world)
Chart 3 (1:14,000,000)(covers Europe)
Global Navigation and Planning Charts (GNCs) (1:5,000,000)
Jet Navigation Charts (JNCs) (1:2,000,000)
Operational Navigation Charts (ONCs) (1:1,000,000)
Tactical Pilotage Charts (TPCs) (1:500.000)
Joint Operations Graphics-Air (JOGs) (1:250,000)

The ITC custom disk contains maps of the area of operations that planners are interested in on one laser disk. The map name and scale of maps on the ITC disk are listed below.

Chart 3 (covers Europe) (1:14M)
Global Navigation and Planning Charts (GNCs) (1:5,000,000)
Jet Navigation Charts (1:2,000,000)
Operational Navigation Charts (ONCs) (1:1,000,000)
Tactical Pilotage Charts (TPCs) (1:500,000 except where overlap
                                    with AFCENT charts)
Joint Operations Graphics-Air (JOGs) (1:250,000)
All AFCENT Low-Fly Charts (charts 1-8) (1:500,000)

Instructions for inserting the disk into the Sony disk player may be found in the TIPS Data Base Specification and in the instructions that come with the device.

SECTION V

MAJOR TIPS FUNCTIONS

V.1 INITIALIZATION MENU

The Initialization (INIT) menu (Figure V.1-1) is the first menu displayed after logging on to TIPS. It is displayed with default values that the user can change.
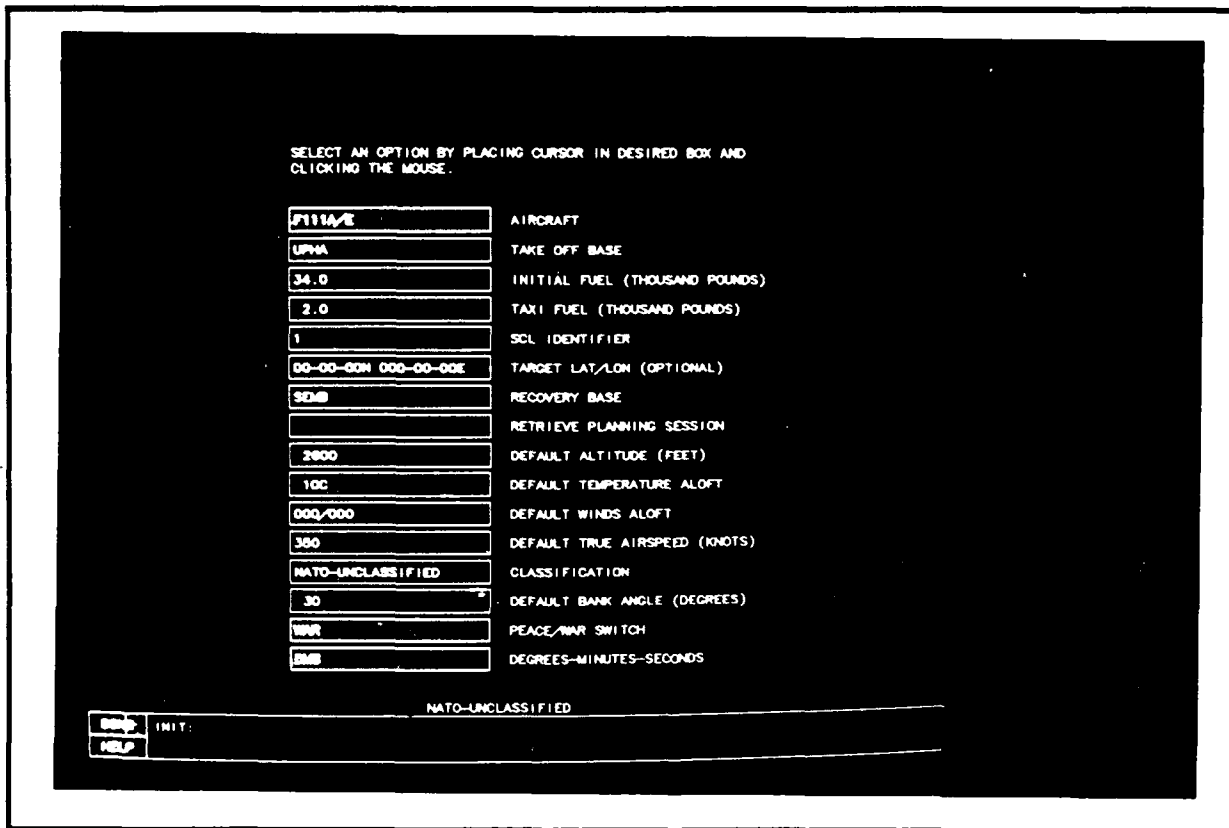

Figure V.1-1 Initialization (INIT) Menu

When finished with the INIT menu, the user selects the DONE command box. The user cannot access the INIT menu again this session unless he or she selects the CLEAR command from

the MAIN menu. The CLEAR command will delete an unsaved route
from the data base and will reset all INIT values to their
default values. To change INIT values without deleting or
saving a route, the user must change the modified Form 691
boxes at the top of the RGEN menu.

The INIT menu options are listed below in the order they
appear on the menu.

AIRCRAFT - This toggle option switches between three
different aircraft types; F111A/E, F111D and F111F. To toggle
this option, click the mouse in the AIRCRAFT command box until
it displays the desired aircraft type. F111A/E is the default
value that is displayed the first time you enter the INIT menu.

TAKE OFF BASE - This option allows the user to enter the
name of a take-off base. To do this, click the mouse in the
TAKE OFF BASE command box and type in the four-character name
of a new take-off base. If you do not know the name of the
take off base you want and you wish to see a list of all take
off bases, you can enter any non-blank character (except "?"
which displayes HELP) and an alphabetized LIST menu containing
all take-off bases will be displayed. UPHA, Upper Heyford, is
the default take-off base.

INITIAL FUEL (Thousands of Pounds) - This option allows
the user to enter the amount of fuel that the aircraft has
prior to take-off. To enter this amount, click the mouse in
the INITIAL FUEL command box and type in the new value. The
default value is 34.0. All fuel values are in thousands of
pounds; therefore, this value is 34 thousand pounds.

TAXI FUEL (Thousands of pounds) - This option allows the
user to enter the amount of fuel to be burnt during taxi and
take off. To change this amount, click the mouse in the TAXI
FUEL command box and type in the new value. The default value
is 2.0. All fuel values are in thousands of pounds; therefore,
2.0 is 2,000 pounds.

SCL IDENTIFIER - This option allows the user to enter an
SCL identifier. To enter this parameter, click the mouse in
the SCL IDENTIFIER box and type in the new value. If the user
types in a non-existent SCL (any non-blank character other than
"?"), an alphabetized list menu will be displayed showing all
SCLs and a definition of each. The default SCL is 1. This SCL
corresponds to a clean aircraft, with neither ordnance nor
racks. It is displayed on the INIT menu when the user first
logs onto TIPS.

TARGET (LATITUDE/LONGITUDE) - This option allows the user
to enter a target location. The target location may be entered
using the LAT/LON, a TACAN or a "known point". To enter the
target location, click the mouse on the TARGET command box and
type in the new location. The default value is 00-00-00N 000-

00-00E. It is displayed the first time the user enters the
INIT menu on a TIPS run. The user does not have to specify a
target to generate a route.

     RECOVERY BASE - This option allows the user to enter the
name of the recovery base. To do this, click the mouse in the
RECOVERY BASE command box and type the name of a recovery base.
If you wish to see a listing of recovery bases, type a non-
blank character (except "?" which displays HELP), and the
alphabetized LIST menu containing all recovery bases will be
displayed. UPHA (Upper Heyford) is the default recovery base.

     RETRIEVE PLANNING SESSION - This option allows the user
to retrieve a planning session that was saved either using the
SAVE SESSION command in the RGEN menu or the SAVE SESSION
command in the MAIN menu. To use this option, click the mouse
on the RETRIEVE PLANNING SESSION command box and then enter the
name of the session to be retrieved. If you enter the name of
a non-existent session, the LIST menu will display an
alphabetized list of all saved sessions to aid you. This
option does not have a default value. Once the user types the
name of a valid session or clicks the mouse on one of the
options on the LIST menu, that session is retrieved and the
INIT menu is redisplayed. The user may change only the SCL
IDENTIFIER, AIRCRAFT and classification values and the
PEACE/WAR and DMS toggles. All other command boxes are
unselectable.

     DEFAULT ALTITUDE (FEET) - This option allows the user to
change the enroute altitude for the first leg (which will be
the altitude for subsequently entered legs unless the altitude
is changed in the altitude box). The default altitude
displayed in the INIT menu after logging on to TIPS is 10,000
feet MSL (all altitudes are MSL except optimized altitudes
which are AGL). If the user changes altitude, the default
temperature aloft is changed automatically, using a two degree
per 1000 feet temperature gradient. The user should set the
altitude to the nominal/initial cruise altitude. Although all
leg altitudes may be changed later, it is more convenient to
start out with the correct initial altitude. To change the
altitude, click the mouse in the DEFAULT ALTITUDE command box.

     DEFAULT TEMPERATURE ALOFT - This option allows the user
to enter the temperature. Either Fahrenheit and Celsius
temperatures are acceptable entries, however, TIPS assumes you
are entering Celsius if you do not append your entry with an
"F" (e.g., 20F). To enter the new temperature, click the mouse
on the DEFAULT TEMPERATURE ALOFT command box and type in the
new temperature. The default temperature is -5C. TIPS will
adjust the temperature using standard temperature deviations
(2°/1000')

     DEFAULT WINDS ALOFT - This option allows the user to
change the direction and speed of the winds. To change the

winds, click the mouse on the DEFAULT WINDS ALOFT command box
and type in the new wind using the format "ddd/sss," where ddd
is the direction clockwise from true north from which the wind
is coming, and sss is the speed in knots. The default value is
000/000.

DEFAULT TRUE AIRSPEED (KNOTS) - This option allows the
user to change the true airspeed. To change the true airspeed,
click the mouse on the DEFAULT TRUE AIRSPEED command box and
type in the new airspeed. Only airspeeds between .35 and .95
MACH are allowable. The default true airspeed is 350 knots.
It is displayed on the INIT menu when the user first logs on.

CLASSIFICATION - This option allows the user to enter the
classification level. The default is: NATO UNCLASSIFIED. To
change this classification level, click the mouse on the
CLASSIFICATION box and type in the new value.

DEFAULT BANK ANGLE (DEGREES) - This option allows the
user to change the bank angle. To change the bank angle, click
the mouse on the DEFAULT BANK ANGLE command box and type in the
new bank angle. The default bank angle is 0. This value
corresponds to stick-route planning.

PEACE/WAR TOGGLE - This option allows the user to toggle
between the PEACE and WAR modes of TIPS. Use the PEACE mode
for normal operations. The WAR mode is to be used for
exercises and training for wartime situations. The default
value is PEACE.

DECIMAL DEGREES - This option is a 4-way toggle switch.
It allows the user to switch between the geographical
coordinate formats that TIPS uses to present
latitude/longitude. The four formats the user can toggle
between are:

DMS (degrees-minutes-seconds) - The format for DMS is:
      dd-mm-ssH ddd-mm-ssH   Example: 50-30-15N 007-59-06E

DM (degrees-minutes) - The format for degrees-minutes is:
      dd-mm.mmH ddd-mm.mmH   Example: 50-30.25N 007-59.10E

D (degrees) - The format for degrees is:
    dd.ddddH ddd.ddddH   Example: 50.5042N 007.9850E

UTM (UTM coordinates) - The format for UTM coordinates is:
      IIZ CCIIIIIIII   Example: 32U MA2809529

d=degrees, m=minutes, s=seconds, H=hemisphere,
I=integer, Z=UTM zone, C=character

In the case of UTMs, the formats are valid for both input
and output, that is, if the user sets UTM, all output will be
in UTM and only UTM is acceptable for input. Attempts to input

other than UTM results in an error message.   This however is
not the case for DMS, DM, and D.   If any one of the three
formats are toggled, only the one toggled to is output, but any
of the three may be entered without receiving an error message.

V.2   ROUTE GENERATION/FORM 691 OUTPUT

The Route Generation (RGEN) menu (Figure V.2-1) allows
the user to create and modify a route both graphically using
the mouse and textually using the keyboard.

Figure V.2-1   Route Generation (RGEN) Menu

Command boxes on the RGEN menu are located along the top
and along the left side of the menu.   The videomap fills most
of the remaining portion of the screen.

The video map display background (which appears on the
CMFR menu allows the user to quickly scale the map to one of
seven different scales ranging from the smallest scale of
1:250,000 to the largest scale of 1:30 million.

The route is displayed on the videomap.   When first
entering the RGEN menu, the initial route may be displayed in
one of four ways:

(1)   If a target was specified in the INIT menu and
the take-off base and recovery base are the same, a
straight line between the take-off base and target is
displayed.

(2)   If a target was specified in the INIT menu and
the take-off base and recovery base are different, a
straight line between the take-off base and target and
a straight line between the target and the recovery
base are displayed.

(3)   If no target was specified in the INIT menu and
the take-off base and recovery base are the same, the
route is displayed as a single point.

(4)   If no target was specified in the INIT menu and
the take-off base and recovery base are different, the
route is displayed as a straight line between the
take-off base and recovery base.

There are seven different types of points that may be
found on or associated with a route.   These points are
symbolized by six different symbols (Loiter and Refueling
Designators are symbolized by an orbit point) shown in Figure
V.3-3.

The selected waypoint is an important marker to be aware
of when using the TIPS RGEN menu.   The selected waypoint is the
waypoint on the route with a blinking pink circle around it.
The selected leg is the leg preceding the selected waypoint.
When you first enter the RGEN menu, the base is the selected
waypoint.   Information about the selected waypoint is displayed
across the top of the RGEN menu and on the textual screen when
the RGEN menu is displayed.   Various commands on the RGEN menu
use the selected waypoint as you will see in the command
descriptions below.

Information on the selected waypoint is displayed on the
modified Form 691 line/command boxes located across the top of
the screen.   The top line serves to output information on the
selected waypoint and as a series of command boxes that allow
the user to input data by modifying and creating a route.   All
selectable (blue) command boxes across the top of the RGEN
menu, except for the command boxes to the right of the TEXT
INSERT command box (those that scale), if selected, prompt a
user to input Form 691 data via the keyboard.

The TEXT INSERT command box, located just above the
SELECT POINT command box, is used to textually insert
waypoints.   The user may enter waypoints in several different
formats which are described below under the TEXT INSERT command
box description.

The default mode for the RGEN menu is the insert-a-point mode. Graphic insert of waypoints is accomplished whenever no commands are active by simply clicking the mouse anywhere on the video screen.

Six of the TIPS waypoints are special points.   These points are:

TARGETS
INITIAL POINTS
OFFSET AIM POINTS
FINAL UPDATE POINTS
LOITER DESIGNATOR
REFUELING DESIGNATOR

These points may be added to the route only by clicking the mouse on the SPECIAL POINTS command box in the RGEN menu and then following the prompts that appear on the SPPT menu (see Figure V.2-2).

Figure V.2-2   Special Point (SPPT) Menu

Targets and Initial Points are inserted after the selected point and at a location designated by the user; either graphically or textually.   OAPs and FUPs are associated with the selected waypoint and are inserted at a user-designated location using the mouse or by typing.   If a Loiter or

Refueling Designator is being added, the FLOP menu (Figure
IV.2-3) is displayed. The FLOP menu allows the user to add
time to a leg (default time is 0:00), change the airspeed
(default airspeed is the airspeed for the selected leg), change
the altitude (default altitude is the altitude for the selected
leg) or specify an amount of fuel to onload (default is 0 for
refueling). The fuel onload option is unselectable for the
Loitering Designator. The user changes as many of the values
as desired and then adds the leg point by clicking the mouse in
the OK command box.
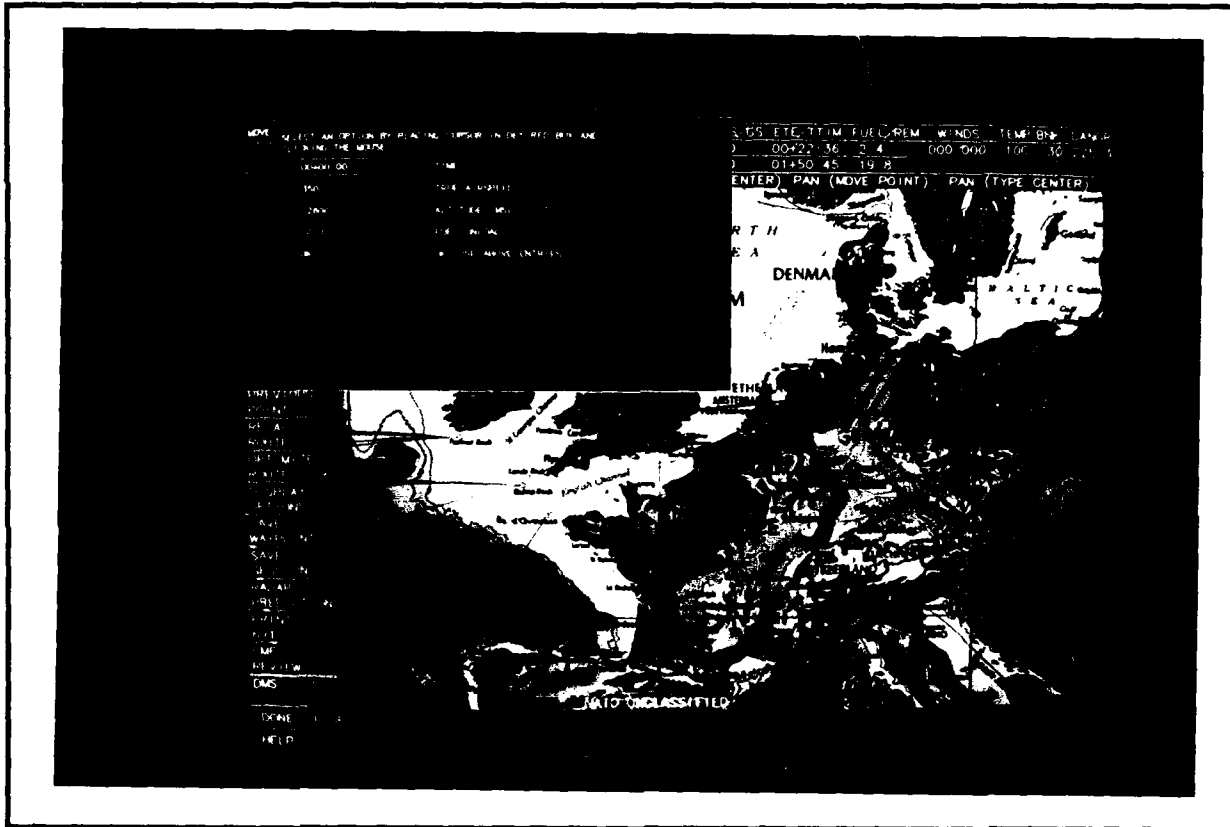
Figure V.2-3   Fuel and Loiter Point (FLOP) Menu

        The six scaling command boxes are located to the right of
the TEXT INSERT command box. The scaling commands enable the
user to change the scale, set a big scale and a small scale,
and move the map (pan) either textually or graphically.

        The column of command boxes beginning with Select Point
are used to graphically create and modify the route.

        When the RGEN menu is displayed, a series of nominally
four Form 691 lines are simultaneously displayed on the textual
screen. Form 691 data is displayed for the selected waypoint
(denoted by four asterisks) as well the point prior to the
selected waypoint (if that point exists) and two points
subsequent to that waypoint (if they exist).

The following are descriptions of the command boxes on the RGEN menu. They are divided into two sections; those boxes that are Form 691 items, and other RGEN boxes. They are arranged in the order they appear on the RGEN menu. Information on theses parameters as well as any of the command boxes may be displayed by selecting the HELP command box as described in this manual.

V.2.1 Form 691 COMMAND BOXES on the RGEN Menu

WAYPOINT IDENT - This box displays the name of the selected waypoint. It is a black command box and always non-selectable.

CHECKPOINT - This option displays the geographic coordinates of the selected waypoint. The selected waypoint may be moved by clicking the mouse on the CHECKPOINT command box and typing in new coordinates. One reason users may wish to change the selected waypoint in this way, would be if they originally entered the waypoint using the TEXT INSERT command box and made an error.

The format for the coordinate is normally latitude and longitude separated by one or more spaces. Examples are:

```
50N  5E             (50 deg N lat; 5 deg E lon
5034N 00030E        (50 deg, 34 min N; 0 deg, 30 min E)
5034.12N 00030.12E  (50 deg,34.12 min N; 0 deg, 30.12 min.E)
503457N 0003012E    (50deg, 34min 57sec N; 0deg,30min 12sec E)
```

where the hemisphere is optional, the defaults are North latitude and East longitude; hyphens between degrees and minutes and between minutes and seconds are optional.

If the geographical coordinate format is set to UTM, then instead of entering latitude and longitude, you must use the 6, 8, or 10 digit UTM coordinate. Examples are:

```
        32U MA28029529
        MA2895
```

The UTM zone is optional. If omitted, it defaults to 31U, 32U or 33U, depending on the UTM coordinate.

Regardless of the setting of the geographical coordinate format, the following are also valid coordinate designators:

```
ssssssss   (The 1 to 8 character name of a SID)
mmmm       (The 1 to 4 character name of a MIKE point)
nnnnnnnn   (The 1 to 8 character name of a 'known point')
```

TACAN SPECIFICATION - This option is used to move the selected waypoint or to calculate the Radial and DME values of a user-specified TACAN related to the selected waypoint.

The TACAN command box is blank unless the selected waypoint has a TACAN associated with it. This is accomplished by the user having previously specified the TACAN in this command box or the TEXT INSERT command box or by entering a "known point" into the TEXT INSERT command box whose TACAN designator is known in the data base. To change or set the TACAN value, position the cursor in the TACAN command box, click the mouse and type in the TACAN in one of the following three forms:

ttt	(The 3-letter TACAN ID for TACAN overflight)
	(use this to relocate the waypoint)
ttt rrr/ddd	(The TACAN ID, radial and DME)
	(use this to relocate the waypoint)
ttt?	(If you wish TIPS to compute the radial and DME)
	(use this to find the TACAN radial and DME values)

REMARKS - The user may enter remarks in this field. There is an eight-character limit. To enter remarks, position the cursor in the REMARKS box, click on the mouse, then type your remarks. TIPS will sometimes automatically enter remarks in this column which the user may overwrite if desired.

ALTITUDE - This option allows the user to change the altitude for the selected leg (the leg prior to the selected point). To enter the altitude, position the cursor on the upper ALT/DST box, click the mouse, then type in the new altitude in feet, MSL.

DISTANCE - This box is always unselectable. It displays the distance of the leg in nautical miles.

MAGNETIC COURSE - This box is always unselectable. It displays the magnetic course.

MAGNETIC VARIATION - This box is always unselectable. It displays the magnetic variation.

AIRSPEED - This option allows the user to change the true airspeed along the selected leg (the leg prior to the selected point). This causes the ground speed to be recalculated. Only airspeeds between .35 and .95 MACH are allowable. Airspeed is entered and displayed in knots.

GROUNDSPEED - This option allows the user to change the ground speed along the selected leg (the leg prior to the selected point). This causes the true airspeed to be recalculated. This option is the lower TAS/GS command box. Ground speed is in knots.

LEG TIME - This option allows the user to change the amount of time spent on the selected leg (the leg prior to the selected point). The actual format for time is HH+MM:SS, where H=hours (optional), M=minutes (required) and S=seconds (optional). Hours are rarely used; the typical format is MM:SS (example 14:21, i.e., 14 minutes and 21 seconds). This option is the upper ETE/TTIM command box. It is selectable only if the selected point is a FUEL or LOITER point.

TOTAL TIME - This box displays the total time spent on the route up to this point. It is always unselectable. This option is the lower ETE/TTIM command box.

LEG FUEL - This option allows the user to change the amount of fuel consumed on the selected leg (the leg prior to the selected point). Once the new value is entered, TIPS will use the new value for this leg until 0 is entered in this box for this leg. After a 0 is entered, the program will once again calculate the fuel on a leg. The value entered is in thousands of pounds. This command box is the lower FUEL/REM box.

REMAINING FUEL - This option allows the user to change the amount of fuel onloaded during a refueling cycle. If 6000 pounds of fuel have been onloaded, and 8000 are needed, the user may change the fuel onload by clicking on the remaining fuel box and entering the new fuel onload (in this example 8.0). This box will then display the new fuel remaining after onload of the new fuel amount. This value is entered in thousands of pounds. This command box is the lower FUEL/REM command box. It is selectable only if the point is a fuel point.

WINDS - This option allows the user to enter or change wind conditions for the leg prior to the selected waypoint. The format for the wind input is direction/velocity where, direction is in degrees true and velocity is in knots. To enter or change wind conditions, position the cursor in the WINDS box, click the mouse and type the direction/velocity of the wind.

TEMPERATURE - This option allows the user to specify the temperature aloft. The format is : Degrees F or C; for example, 22C or 72F. If you enter a value without entering a temperature scale, degrees Celsius is assumed. This option is the TEMP command box.

BANK ANGLE - This option allows the user to change the bank angle. The value applies to the bank angle of the turn node exiting the leg. TIPS will attempt to make the turn after first overflying the waypoint using this bank angle to reach the next waypoint. A zero bank angle produces a "stick route," assuming point-to-point flight. To change the bank angle, position the cursor in the BNK box, click on the mouse and type

the new bank angle. All subsequently inserted waypoints will
have the new bank angle unless the bank angle is changed again.
The bank angle for the first point is the bank angle value from
the INIT menu. If the bank angle is not large enough to permit
overflying the next waypoint, the bank angle will revert to
zero and a message will be issued.

DANGER - This box is always unselectable. It displays
the danger of the selected leg. The danger is a measure of the
probability of attrition. To find out more about danger; how
it is calculated and what it means, obtain a copy of the FLAPS
Final Report, September 30, 1987 (see the References section of
this manual). This option is the DANGR command box.

V.2.2 Other COMMAND BOXES on the RGEN Menu

TEXT INSERT - This option allows the user to insert
waypoints by typing them in on the keyboard. To insert
waypoints, position the cursor on the TEXT INSERT box, click
the mouse, type in the waypoint coordinate and hit the carriage
return. To insert multiple points, continue typing in points,
hitting the carriage return after entering each point. The
display and Form 691 will be automatically updated after each
point has been inserted. When finished inserting points, hit
the carriage return an extra time to get out of text insert
mode and back in the graphics mode.

The format for the coordinate is normally latitude and
longitude separated by one or more spaces. Examples are:

```
50N  5E            (50 deg N lat; 5 deg E lon)
5034N 00030E       (50 deg, 34 min N; 0 deg, 30 min E)
5034.12N 00030.12E (50 deg,34.12 min N; 0 deg, 30.12 min E)
503457N 0003012E   (50deg, 34min 57sec N; 0deg,30min 12sec E)
```

where the hemisphere is optional; the defaults are North
latitude and East longitude; hyphens between degrees and
minutes and between minutes and seconds are also optional.

If the geographical coordinate format is set to UTM, then
instead of entering latitude and longitude, you must use the 6,
8, or 10 digit UTM coordinate. Examples are:

```
        32U MA28029529
        MA2895
```

The UTM zone is optional. If omitted, it defaults to
31U, 32U or 33U, depending on the UTM coordinate.

Regardless of the setting of the geographical coordinate
format, the following are also valid coordinate designators:

```
ttt            (The 3-letter TACAN ID for TACAN overflight)
ttt rrr/ddd    (The TACAN ID, radial and DME)
```

ssssssss   (The 1 to 8 character name of a SID)
mmmm   (The 1 to 4 character name of a MIKE point)
nnnnnnnn   (The 1 to 8 character name of a "known point")

GRAPHIC INSERT (not a command box) - If the mouse is
clicked on the video map, it will insert a waypoint into the
route. The new waypoint appears in the route after the
selected point.

SCALE (toggle) - This option allows the user to toggle to
another scale or reset the small or big scales. There are
seven scales - from the smallest, 1:250 (1:250,000), to the
largest, 1:30M (1:30,000,000). The current map scale is
displayed in the scale command box.

To use this option, click the mouse in the scale command
box. The word 'WAIT' replaces the scale and all RGEN menu
command boxes turn black (unselectable) except the scale
toggle, BIG = (now RESET BIG), SMALL = (now RESET SMALL) PAN
(CENTER) and PAN (TYPE CENTER) command boxes. Next, "WAIT" is
replaced by the next scale. The user should continue to click
the mouse in the scale toggle box until the desired scale
appears. Then, the user may click the mouse in the RESET BIG
command box to reset the big scale view to the scale displayed
in the scale toggle box; in the RESET SMALL to reset the small
scale view to the scale in the scale toggle box; in PAN
(CENTER) to choose a center point using the mouse and display
the map in the scale in the scale toggle box; or in the PAN
(TYPE CENTER) command box to type in a new center point and
display the map in the scale displayed in the scale toggle box.

BIG = - This option allows the user to display the large
scale map. Before this value is reset using the scale toggle,
its default scale is 1:5M.

SMALL = - This option allows the user to display the
small scale map. The user is prompted to put the cursor on the
desired center point. The small scale map is displayed with
the new center point. Before the value is reset using the
scale toggle, its default scale is 1:500,000.

PAN (CENTER) - This option allows the user to choose a
new center point with the mouse. After selecting this option,
the user is prompted to click the mouse at a location to be the
new center point. If this command was chosen in conjunction
with changing the scale, a new map scale and center point are
displayed. If this command was chosen without choosing a new
scale, the same map scale is displayed with a new center point.
It is possible to shift the map up to one-half a map length at
a time using this command.

PAN (MOVE POINT) - This option allows the user to change
the position of a point on the display. After selecting this
option, the user is first prompted to select a point on the map

to move. Next, the user is prompted to select a location on
the screen on which to move the point that was previously
selected. It is possible to shift the map up to one map length
at a time using this command.

PAN (TYPE CENTER) - This option allows the user to move
the map by typing a location for a new center point. To use
this option, the user clicks the mouse in the PAN (TYPE CENTER)
command box. The user is prompted to enter a LAT/LON, a TACAN,
a "known point" or the ID of a point on the route (e.g., "1" or
"TGT"). A location outside the currently displayed map's
boundaries may be entered, thus there is no limit to how far
the map may be shifted (as long as those maps are available on
the video disk). If this command was chosen in conjunction
with changing the scale, the new map scale and area are
displayed. If this command was chosen without choosing a new
scale, the same map scale with a new area is displayed.

SELECT POINT - This option allows the user to select a
waypoint along the route. The selected waypoint is denoted by
a blinking pink circle around the point. To select a waypoint,
position the cursor on the SELECT POINT option and then click
the mouse. Next, position the cursor on or near the point you
want to select, then click the mouse. If the cursor isn't
positioned exactly on the waypoint, it will select the waypoint
closest to the cursor position. If you select a point where
two or more points share the same location, the LIST menu will
be displayed with a list of the co-located points and prompt
the user select the desired point.

DELETE POINT - The DELETE POINT option allows the user to
delete the selected waypoint. To delete a waypoint, select the
waypoint you want to delete then position the cursor on the
DELETE POINT option and then click the mouse. The new selected
waypoint is the point prior to the deleted point.

MOVE POINT - The MOVE option allows the user to move the
selected point from its current location to a location chosen
with the cursor. The user is prompted to click the mouse at
the new location.

MASS CHANGE - The MASS CHANGE option allows the user to
change two or more contiguous waypoints at once when using the
following RGEN options:

    DELETE POINT
    ALTITUDE
    TRUE AIRSPEED
    GROUND SPEED
    WINDS
    TEMPERATURE
    BANK ANGLE

The user is prompted first to click the mouse on the
starting point of the points to be changed and is prompted
again to click the mouse on the end point of the points to be
changed. The user then clicks on one of the seven RGEN options
listed above and types in the new value.

SPECIAL POINTS - The SPECIAL POINTS option allows the
user to input special points on the route. Special points are
targets, initial points, offset aim points, final update points
and loiter and refueling designators. To insert special
points, position the cursor on the SPECIAL POINTS box and click
the mouse. The SPPT menu is displayed and prompts the user to
make a selection.

NEXT POINT - The NEXT POINT option allows the user to
select the next waypoint along the route after the selected
waypoint. To use this option, position the cursor on the NEXT
POINT command box and click the mouse.

PREVIOUS POINT - The PREVIOUS POINT option allows the
user to select the previous waypoint along the route prior to
the selected waypoint. To use this option, position the cursor
on the PREVIOUS POINT command and click the mouse.

RECALL ROUTE - This option allows the user to recall a
prestored series of waypoints that were stored with the SAVE
WAYPOINTS option of this menu. To recall a route, position the
cursor on the RECALL ROUTE command box, click the mouse and
then type in the name of the stored route. The stored route is
inserted after the selected waypoint.

OPTIMIZE ROUTE - This option allows the user to optimize
a route between the selected waypoint and the next waypoint.
To optimize a route, position the cursor on the OPTIMIZE ROUTE
command and click the mouse. If part of the route being
optimized is in hostile territory, then the LIST menu
containing the altitudes at which the best paths may be
calculated is displayed and the user is prompted to choose an
altitude. After optimization, only the parts of the route just
optimized that are in hostile territory have that altitude.
This option is only selectable when TIPS is running in the War
Mode.

DISPLAY OPTIONS - This command allows the user to display
threat circles and danger contours at different penetration
altitudes and also allows the user to display EC ROZ boxes, the
TCOR network, FLOTs, LLTRs and Chart updates. To display
options, position the cursor on the DISPLAY OPTIONS command
then click the mouse. This displays the DISP menu which
prompts the user to choose the display options. After choosing
options, the RGEN menu is redisplayed with the selected
options.

SAVE WAYPOINTS - The SAVE WAYPOINT(S) command allows the
user to store the entire route or a series of points. To
store, position the cursor on the SAVE WAYPOINT(S) command box
then click the mouse. The SAVE menu is displayed and the user
is prompted to choose to save the entire route or part of the
route and to enter a name and a description of the route or
points to be saved. Note that this command saves waypoints
only; no additional information (such as speed, altitude,
danger, etc.) is saved as when saving a session.

SAVE SESSION - This option allows the user to store an
entire session, that is, all waypoints along with all values in
the route are saved in the TIPS data base and may be recalled
the next time the user logs on to TIPS. It is good practice to
make use of this command frequently while creating your route.
Having a session saved serves as a protection in the event of a
system crash in which you would otherwise lose your work.

To store, position the cursor on the SAVE SESSION command
box then click the mouse. The SAVE menu is displayed and the
user is prompted to enter a name and identification for the
session. If you are saving for backup purposes in the event of
a system crash, you need only enter the name of the session
once. The next time the SAVE menu appears, that file name will
be displayed in the IDENTIFIER box (as will the description in
the DESCRIPTION box if you entered one) and you need only click
on the ALL POINTS box and the current session will overwrite
the old session. To keep the old session and also save a new
session, you must enter a new IDENTIFIER and click the mouse on
the ALL POINTS command box. The SELECT POINTS command box is
unselectable.

RADAR PREDICTION - This command allows the user to make
radar predictions. To make a radar prediction, select a
waypoint or offset aim point whose previous leg you wish to
make a radar prediction from. Next, position the cursor on the
RADAR PREDICTION box and click the mouse. The RADR menu will
be displayed.

PRINT 691 - This option allows the user to output the
Form 691 on the printer. To get a Form 691 printout, position
the cursor on the PRINT command box then click the mouse.

CMF REVIEW - This option allows the user to enter the CMF
review function. To enter CMF Review, position the cursor on
the CMF REVIEW command then click the mouse. The CMFR menu
will be displayed.

DECIMAL DEGREES - This option is a 4-way toggle switch.
It allows the user to switch between the geographical
coordinate formats TIPS uses to present latitude/longitude.
The 4 formats the user can toggle between are:

DMS (degrees-minutes-seconds) - The format for DMS is:

     dd-mm-ssH ddd-mm-ssH   Example: 50-30-15N 007-59-06E

DM (degrees-minutes) - The format for degrees-minutes is:
     dd-mm.mmH ddd-mm.mmH   Example: 50-30.25N 007-59.10E

D (degrees) - The format for degrees is:
     dd.ddddH ddd.ddddH   Example: 50.5042N 007.9850E

UTM (UTM coordinates) - The format for UTM coordinates is:
     IIZ CCIIIIIII   Example: 32U MA2809529

d=degrees, m=minutes, s=seconds, H=hemisphere,
I=integer, Z=UTM zone, C=character

V.2.2.1 Optimization on the RGEN Menu

     Optimization is a TIPS option that computes the best path
between the selected waypoint and the next waypoint. The path
is the best in that it follows the minimum danger path on the
hostile side of the IFF-ON line, and follows the transit
corridor route (TCOR) and low level transit route (LLTR) on the
friendly side of the IFF-ON line.

     The optimization command may be invoked only when running
TIPS in the War Mode by selecting the OPTIMIZE ROUTE command on
the RGEN menu. Below are several cases describing how the
optimized path is drawn with respect to the location of the
selected point and the next point.

- •   If the selected point and the next point are
        on the hostile side of the IFF-ON line, TIPS
        calculates the minimum danger path for the
        optimization.

- • If one of the two points is on the hostile side of the IFF-
  ON line, and one is on the friendly side then:

  - •   If the point on the friendly side is on or
          next to an LLTR, TIPS uses that LLTR between
          that point and the point of the LLTR that
          intersects with the IFF-ON line and uses the
          minimum danger from the end of the LLTR to
          the point in the hostile territory for the
          optimization.

  - •   If the point on the friendly side is not on
          or near an LLTR, TIPS uses the minimum danger
          from the hostile point to the least dangerous
          LLTR and follows that LLTR to the friendly
          point for the optimization.

- • If both points are on the friendly side of the IFF-ON line
  then:

- • If·one of the points (either the selected
    point or the next point) is on the LLTR, the
    route follows that LLTR and the shortest TCOR
    to the other point for the optimization.

- • If neither the selected point or the next
    point is on the LLTR, the route follows the
    shortest TCOR for the optimization.

- • If both the selected point and the next point
    are on the same LLTR, the route follows that
    LLTR for the optimization.

- • If the selected point and the next point are
    on different LLTRs, the shortest TCOR path
    connecting the two LLTRs is used for
    optimization.

- • Regardless of the location of the selected waypoint or the
  next waypoint, if there are no LLTRs or TCORs, then a
  straight line route on the friendly side and the minimum
  danger on the hostile side of the IFF-ON line are used for
  the optimization.

V.2.3 Display Menu

The display (DISP) menu (Figure V.2.3-1) is a quarter-
screen menu accessed through the RGEN menu. It allows the user
to display graphics representing threat circles, danger
contours, EC ROZ boxes, a TCOR network, a FLOT, LLTRs and Chart
updates (CHUM data) on the video map. All graphics may be
displayed when running TIPS in the War Mode, but only Chart
updates may be displayed when running TIPS in the Peace Mode.
The following describes each of the display options.

THREAT CIRCLES - This option allows the user to toggle
threat circles on or off the video display. All threat circles
in the data base are displayed. The size of the threat circles
is dependent on the penetration altitude displayed in the box
to the right of the THREAT CIRCLE and DANGER CONTOUR boxes.
This value may be changed as described below under "AT
PENETRATION ALTITUDE." Threat circle markers are red circles.
This option is selectable only if TIPS is in the War Mode.

DANGER CONTOURS - This option allows the user to toggle
danger contours on or off. Danger contours have been averaged
over eight directions using an unsuppressed statespace. Danger
contours are displayed at the penetration altitude displayed in
the box to the right of the THREAT CIRCLE and DANGER CONTOUR
boxes. White danger contours depict areas of greatest danger,
while areas of lesser danger are different shades of blue with
the darkest shade of blue depicting the least dangerous areas.
This box is selectable only if TIPS is in the War Mode.

AT PENETRATION ALTITUDE - This toggle switch allows the
user to choose the penetration altitude at which threat circles
and danger contours are to be displayed. The penetration
altitude is the altitude at which the statespace was built.
Typically there are four penetration altitudes used to build a
statespace.   This option is selectable only in the War Mode
and only if at least one option, THREAT CIRCLES or DANGER
CONTOURS are toggled ON.

EC ROZ BOXES - This option allows the user to toggle the
EC ROZ boxes on and off. EC ROZ BOXES are displayed as green
rectangles of various sizes. This option is selectable only in
the War Mode.

TCOR NETWORK - This option allows the user to toggle the
TCOR network on and off. The TCOR network marker is a network
of yellow lines. This option is selectable only in the War
Mode.
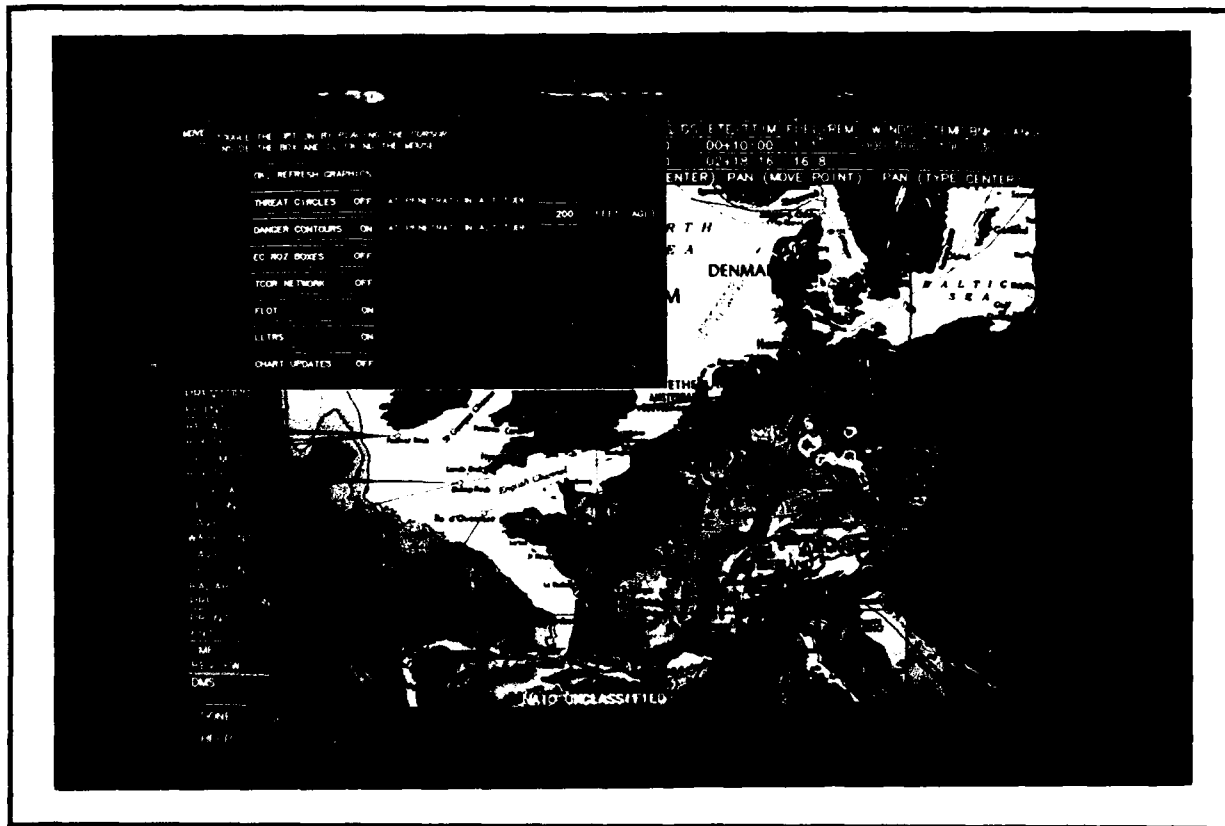
Figure V.2.3-1   Display (DISP) Menu

FLOT - This option allows the user to toggle the FLOT,
IFF-ON and IFF-OFF lines on and off   They are displayed as
yellow lines. This option is selectable only if TIPS is in the
War Mode.

LLTRS - This option allows the user to toggle the LLTRs on and off. LLTRs are displayed as bright pink lines. This option is selectable only if TIPS is in the War Mode.

CHART UPDATES - This option toggles the Chart updates on and off. Chart updates are denoted by orange circles and a 1- 24 character description. This option is selectable when running TIPS in the War Mode and is the only display option selectable when running TIPS in the Peace Mode.

V.3 CMF REVIEW

The purpose of the Combat Mission Folder Review (CMFR) Menu (Figure V.3-1) is to allow the user to review the combat mission folder, make changes to it and print the CMF pages. Requirements stated in USAFR 55-125 were used as a guide to design the CMF review function.
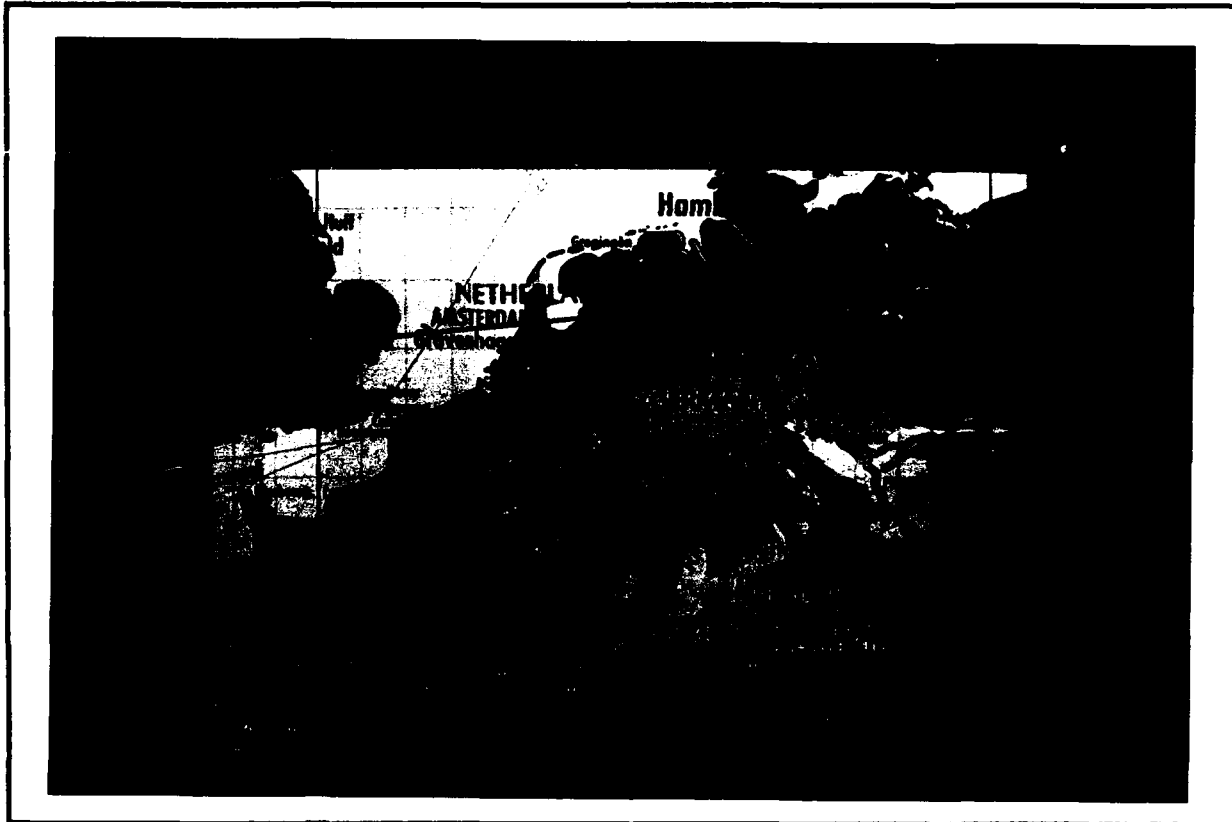
Figure V.3-1   Combat Mission Folder Review (CMFR) Menu

Upon entering the CMFR menu, the entire route is displayed on the smallest map scale capable of accommodating the route. The user may then display individual legs on the route. Once a leg is displayed, the picture of the entire route may be redisplayed only by exiting and then reentering the CMFR menu. Individual legs on the route may be displayed at any scale depending upon the setting at the toggle scale

option. Initially this is set to AUTO SCALE. When AUTO SCALE
is on, the scale the leg is displayed at depends on the
altitude of that leg. If the leg has an altitude of 6,000 feet
or higher, the leg is displayed at a scale of 1:5M. If the leg
has an altitude lower than 6,000 feet, the leg is displayed at
a scale of 1:500,000. The scale determines how many legs will
fit on a page.

The individual legs of the route include doghouses, which
are associated with a leg, doghouse tags, which are associated
with waypoints and waypoint IDs. All three of these objects
may be moved using the MOVE OBJECT command box. The rotated
leg(s) is centered across the screen from left to right.
Doghouses and doghouse tags are displayed across the bottom of
the screen from left to right. The point IDs are displayed
beside the points they identify. Figure (V.3-2) shows the data
contained in a doghouse and doghouse tag.

DOGHOUSES
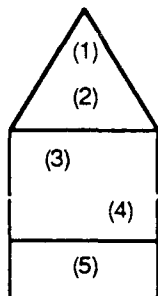
(1) Magnetic variation of waypoint
(2) True course after rollout to next waypoint
(3) Time to go to next waypoint
(4) Distance to next waypoint in nm
(5) Blank area for handwritten remarks

DOGHOUSE TAGS
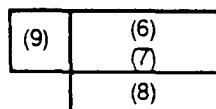
(6) Latitude for waypoint
(7) Longitude for waypoint
(8) Will be left blank for elevation above mean
      sea level of waypoint
(9) Waypoint ID

Figure V.3-2 Doghouse and Doghouse Tags

There are seven different types of points in the TIPS
program and six different symbols for these points (the fuel
and refueling designators are both symbolized by an orbit
point). All of these symbols are shown and described in Figure
V.3-3.

Moving an object, rescaling, specifying a maximum number
of legs to be shown on the page, changing the
latitude/longitude format and specifying the waypoint with
which to begin a leg are the only changes the user may make on

the CMFR menu.   If users wish to make adjustments to the route,
they must reenter the RGEN menu.

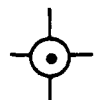**WAYPOINT** - Circle centered on waypoint
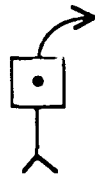
INITIAL POINT - Square centered on IP, course line
perpendicular to base

TARGET - Equilateral triangle with base perpendicular to
course line.

OFFSET AIM POINT - Parallel to leg associated with it
(IP - target leg).

**FINAL UPDATE POINT** - Parallel to leg associated with it
(IP - target leg).

ORBIT POINT - Race track to right of course line.

Figure V.3-3   Point Symbols

Tick marks (Figure V.3-4) are small marks perpendicular
to the route that note the distance to the next waypoint
(distance tick marks) and the time elasped (time tick marks).
Distance tick marks are drawn to the left of the route every 10
miles.   Every other ten mile marker is labeled begining with
the 10 mile marker (i.e., 10, 30, 50, 70...).   Time tick marks
are drawn to the right of the route every minute.   Only even
minutes are labeled.   Starting at the take-off base, the time
tick marks represent the time that has elapsed since take-off.

At the IP, time starts at zero and is the time elapsed since
the IP point. At the last target, the time elapsed is zeroed
again and from the last target to the recovery base the time is
the time elapsed from the last target. Tick marks appear only
on maps with scale less than 1:5 million (i.e., 1:250,000,
1:500,000, 1:1 million, 1:2 million)
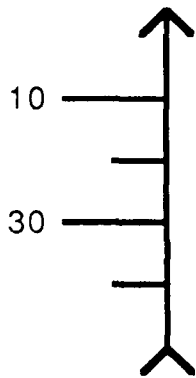
DISTANCE MARKS - to left of the route. A mark every 10nm.
Long marks (1/2 inch). Short marks (1/4
inch). Long marks on odd multiples of
10 and labeled.

10

30
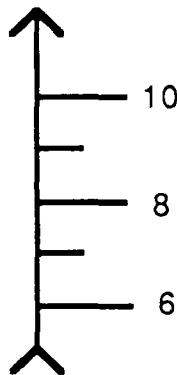
TIMING MARKS - to right of the route. A mark every minute.
Elapsed time. Length of marks same as
distance marks. Long marks labeled with
even values.

10

8

6

Figure V.3-4   Tick Marks

The following are options on the CMFR menu.

ROUTE GENERATION - This option transfers control back to
the RGEN menu. In the RGEN menu, the selected waypoint is the
take-off base and the map scale is the smallest scale that can
accommodate the entire route.

If any of the options on the CMFR menu are toggled, this
option becomes unselectable until the screen is refreshed by
selecting NEXT PAGE, SAME PAGE or SELECT STARTING POINT.

RADAR PREDICTION - This option transfers control to the
Radar Prediction (RADR) menu. The user is prompted to move the
mouse to the desired radar crosshair point. TIPS picks the
waypoint or OAP or FUP closest to the mouse.

If any of the options on the CMFR menu are toggled, this option becomes unselectable until the screen is refreshed by selecting NEXT PAGE, SAME PAGE or SELECT STARTING POINT.

PRINT CMF - This option enables the user to obtain a printout of the current display. The user is prompted to push the CAPTURE button on the Graftel printer interface.

If any of the options on the CMFR menu are toggled, the option becomes unselectable until the screen is refreshed by selecting NEXT PAGE, SAME PAGE or SELECT STARTING POINT.

MOVE OBJECT - This option allows the user to move doghouses, doghouse tags or point names. The user is prompted to click the mouse on the doghouse, doghouse tag or point name to be moved. The user is next prompted to click the mouse on the desired screen location to which they wish to move the doghouse, doghouse tag or point name. This option is only selectable when legs are displayed.

If any of the options on the CMFR menu are toggled, this option becomes unselectable until the screen is refreshed by selecting NEXT PAGE, SAME PAGE or SELECT STARTING POINT.

NEXT PAGE - This option displays the next set of legs on the route.

1.   If you are currently displaying the entire route, which is the case when you first enter the CMFR menu, this option displays the first leg(s) starting at the take-off base.

2.   If you are currently displaying a portion of the entire route (because the entire route wouldn't fit on a single page of the largest scale map available), this option displays the next portion of the entire route.

3.   If you are currently displaying a set of legs, this option displays a set of legs starting at the last waypoint currently displayed (plus some overlap).

4.   If you are currently displaying a portion of a leg, this option displays the next portion of the same leg plus any additional legs that fit on the page. This occurs if the leg you are displaying is too long to fit on one page.

If this option is selected after toggling one or more of the toggle boxes, it will also refresh the screen with the new selections.

SAME PAGE - This option allows the user to refresh the screen after making one or more changes to the map using the toggle boxes.

SELECT STARTING PT. - This option allows the user to choose a waypoint that will be the starting point of an individual leg to be displayed on a page. The user is prompted to enter a waypoint ID or a LAT/LON of a starting point. If a LAT/LON is entered, TIPS starts the page with the waypoint closest to the given LAT/LON.

If this option is selected after toggling one or more of the toggle boxes, it will also refresh the screen with the new selections.

DMS - This option is a 4-way toggle switch. It allows the user to switch between the geographical coordinate formats that TIPS uses to present latitude/longitude. The four formats the user can toggle between are:

DMS (degrees-minutes-seconds) - The format for DMS is:
    dd-mm-ssH ddd-mm-ssH   Example: 50-30-15N 007-59-06E

DM (degrees-minutes) - The format for degrees-minutes is:
    dd-mm.mmH ddd-mm.mmH   Example: 50-30.25N 007-59.10E

D (degrees) - The format for degrees is:
    dd.ddddH ddd.ddddH   Example: 50.5042N 007.9850E

UTM (UTM coordinates) - The format for UTM coordinates is:
    IIZ CCIIIIIIII   Example: 32U MA2809529

d=degrees, m=minutes, s=seconds, H=hemisphere,
I=integer, Z=UTM zone, C=character

In the case of UTMs, the formats are valid for both input and output, that is, if the user sets UTM, all output will be in UTM and only UTM is acceptable for input. Attempts to input other than UTM results in an error message. This however is not the case for DMS, DM, and D. If any one of the three formats are toggled, only the one toggled to is output, but any of the three may be entered without receiving an error message. DMS is the default (it is the toggle displayed in the box when you first enter the menu).

AUTO SCALE - This is a toggle that allows the user to toggle to different scales or to AUTO SCALE. TIPS automatically chooses the scale based on the altitude of the legs to be displayed when AUTO SCALE is selected. AUTO SCALE is the default (it is the toggle displayed in the box when you first enter the CMFR menu).

NO LEG LIMIT - This is a toggle that allows the user to toggle a limit to the number of legs to be displayed when

displaying the legs of the route. The default is NO LEG LIMIT.
NO LEG LIMIT means that TIPS will figure out how many legs can
fit on a page.

V.4 RADAR PREDICTION

TIPS produces radar predictions which are intended to
predict the actual air-borne radar displays at user-selected
locations along the route. The TIPS algorithm for making radar
predictions is based entirely on digitized terrain data and does
not make use of cultural data features (e.g., cities). Even with
this limitation, the TIPS radar predictions are quite accurate.

The Radar Prediction (RADR) menu (Figure V.4-1) has 20
parameters for setting up a radar prediction. Each parameter
must have a value in it for a radar prediction to be made. Most
of the command boxes are filled in with default values. Mission
planners need not worry about changing most of the values; most
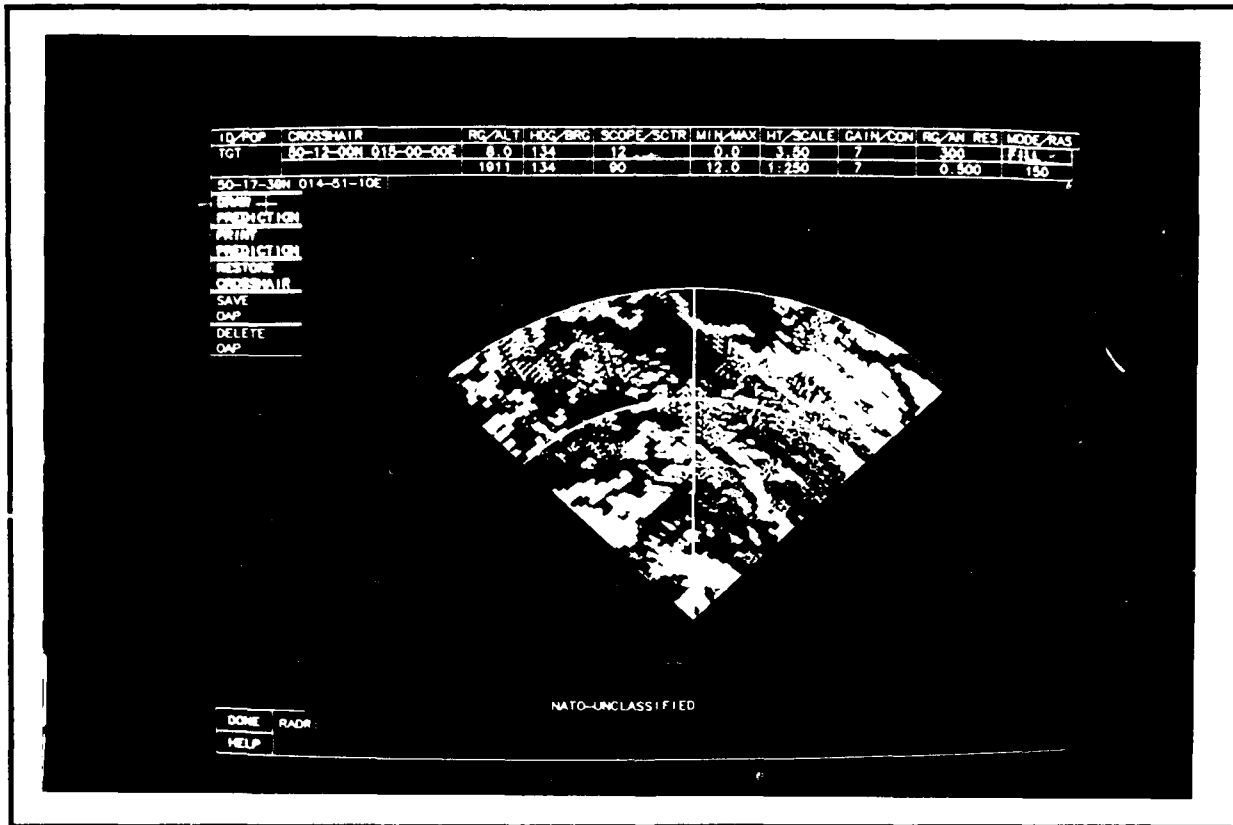should remain set at the default values.

Figure V.4-1   Radar Prediction (RADR) Menu

Table V.4-1 lists the names of the parameters in the order
they are found on the menu, the default values, whether or not
the command is selectable and short description of the parameter.

All 20 parameters are defined more fully below.

ID (point ID) - The name of the radar crosshair point. This
option is always unselectable. If the previous menu was the RGEN
or CMFR menu, this box is filled in with the name of the selected
waypoint. If the previous menu was the MAIN menu, the box is
blank since the MAIN menu does not display the route.

POP (point of prediction) - Gives the LAT/LON of the
airplane. It is an informative parameter only and therefore non-
selectable.

CHECKPOINT (crosshair location) - The crosshair location is
displayed in the upper CHECKPOINT command box. The value is
displayed in one of the geographical formats, D, DM, DMS or UTM,
depending on what the the geographical format was last set to in
the INIT, RGEN or CMFR menu. This option is selectable and the
crosshair location may be moved by typing in one of the formats
described below.

Table V.4-1
Radar Prediction Parameters

NAME	DEFAULT	S/NS	DESCRIPTION
ID	NONE	NS	Name of Crosshair Point
POP	NONE	NS	LAT/LON of Aircraft
Checkpoint	NONE	S	LAT/LON of x-hair Pt.
Checkpoint	NONE	NS	TACAN of x-hair point
RG	8.0	S	Crosshair range (NM)
ALT	400	S	Aircraft Altitude (Feet)
HDG	360	S	Radar Heading (Deg. Mag.)
BRG	360	S	Bearing to crosshair (Deg. Mag.)
SCOPE	12.0	S	Radar Scope Setting (N.M.)
SCTR	90.0	S	Radar Sector Angle (Deg.)
MIN	0.0	S	Minimum Range to Plot (N.M.)
MAX	12.0	S	Maximum Range to Plot (N.M.)
HT	3.5	S	Hardcopy Height (inches)
SCALE	1:250000	S	Hardcopy Map Scale
GAIN	7	S	Radar Gain (1 to 10)
CON	7	S	Radar Contrast (1 to 20)
RG RES	300	S	Range Resolution (Feet)
AN RES	0.5	S	Angular Resolution (Deg.)
MODE	FILL	S	Toggle FILL or LINES
RAS	150	S	Hardcopy Rasters per inch

S = selectable command box
NS = non-selectable command box

If the geographical format was last set to D, DM or DMS, you
may type in a value in D, DM, or DMS, but the format of the
output will be displayed in the geographical coordinate format
that was last set.

50N 5E   (50 deg N lat; 5 deg E lon)
5034N 00030E   (50 deg, 34 min N; 0 deg, 30 min E)

```
5034.12N 00030.12E (50 deg, 34.12 min N; 0 deg, 30.12 min
                       E)
503457N 0003012E    (50 deg, 34 min 57 sec N; 0 deg, 30 min
                       12 sec E)
```

where the hemisphere is optional, the defaults are North latitude and East longitude; hyphens between degrees and minutes and between minutes and seconds are optional.

If the geographical coordinate format was previously set to UTM, then instead of entering latitude and longitude, you must use the 6, 8, or 10 digit UTM coordinate. Examples are:

```
        32U MA28029529
        MA2895
```

The UTM zone is optional. If omitted, it defaults to 31U, 32U or 33U, depending on the UTM crosshair location.

Regardless of the setting of the geographical coordinate format, the following are also valid crosshair location designators:

```
    ppppppp   (The 1 to 8 character name of a waypoint)
    ssssssss  (The 1 to 8 character name of a SID)
    mmmm      (The 1 to 4 character name of a MIKE point)
    nnnnnnnn  (The 1 to 8 character name of a 'known point')
```

CHECKPOINT (TACAN) - A TACAN is displayed only if one was put into the RGEN menu. This parameter is non-selectable.

RG (range) - The distance from the point of prediction to the radar crosshair in nautical miles.

ALT (altitude) - The altitude of the aircraft above the ground in feet, AGL.

HDG (radar heading) - The heading of the aircraft in degrees magnetic.

BRG (bearing) - The bearing from the point of prediction to the radar crosshair in degrees magnetic. Normally this is the same as the heading, except in the case of offset aim points.

SCOPE - The maximum range of the radar in nautical miles.

SCTR (sector) - The total angular width of the radar display in degrees.

MIN RANGE (minimum range) - The minimum range to be plotted, in nautical miles. The minimum range is normally zero, but any value up to the crosshair range may be selected. When the minimum range is changed, either the size or the map scale is automatically recomputed. Normally map scale is recomputed, and

size is unchanged. However, if the user has reset the map scale, then size is recomputed and map scale is unchanged.

MAX RANGE (maximum range) - The maximum range to be plotted in nautical miles. The MAX RANGE is normally the same as the scope setting, but any value between the crosshair range and the scope setting may be selected. When the MAX RANGE is changed, either the size or the map scale is automatically recomputed. Normally map scale is recomputed, and size is unchanged. However, if the user has reset the map scale, then size is recomputed and map scale is unchanged.

HT (height) - The height of the hardcopy output in inches. When the size is changed, the map scale is automatically recalculated.

SCALE - The map scale of the hardcopy ouput. When the map scale is changed, the size is automatically recalculated.

GAIN - The radar gain. Higher values of gain allow weaker radar returns to be displayed. The suggested gain is 7.

CON (contrast) - The radar contrast. Higher values of contrast result in more shades of gray that distinguish strong from weak radar returns. The suggested contrast is 7.

RG RES (range resolution) - The range increment used for the radar prediction.

AN RES (angular resolution) - The angle between successive filled rectangles or line segments in the display in degrees.

MODE - MODE should be set equal to FILL, if filled rectangles are to be plotted; or LINE, for line segments. Filled rectangles are considered best for hardcopy output; some analysts consider line segments best for visual display. When the user changes fill, it is automatically toggled from FILL to LINE, or LINE to FILL.

RAS (raster) - The number of rasters per inch for the Versatec printer.

V.4.1 User Interface to Make a Radar Prediction

To make a radar prediction, the user must access the RADR menu. The RADR menu may be accessed through three different menus: the CMFR menu, (which is used to prepare the CMF), the RGEN menu, (which is used to construct routes) and the MAIN menu, (which is the menu that branches to the main TIPS functions). Most users will enter radar prediction through the CMFR menu. The three ways to access the Radar Prediction function are described below:

CMFR menu - This is the menu that most mission planners will go through to produce a radar prediction. In the CMFR menu, the user clicks on the RADAR PREDICTION box, then clicks again close to the route point or offset aim point at which the radar crosshair is to be located.

RGEN menu - Go through this menu if you are creating a route and want to see if the IP you are considering is a good one. In the RGEN menu, make sure that the IP is the selected point, and then click on the RADAR PREDICTION command box.

MAIN menu - Go through this menu if you want to see the radar prediction of a specific point for which you know the geographic coordinate. A radar prediction produced in this way is not associated with a route. In the MAIN menu, click on the RADAR PREDICTION command box. In the RADR menu, the user needs to specify four of the 20 radar prediction parameters, crosshair location, RANGE, HEADING and BEARING before a radar prediction can be made.

In addition to the 20 parameters for setting up a radar prediction, the RADR menu has five command boxes that perform some function when selected and a graphic input mode that moves the crosshair. These options are explained below:

DRAW PREDICTION - This option displays the radar prediction on the screen.

PRINT PREDICTION - This option enables the user to obtain a printout of the current display. The user is prompted to press the capture button on the Graftel printer interface.

RESTORE CROSSHAIR - This option restores the crosshair to the original crosshair position (the position of the crosshair when the prediction was first drawn).

SAVE OAP - This option is selectable only if the user enters the RADR menu from the RGEN menu. Selecting this option allows the user to make the crosshair point an OAP. To save an OAP at the crosshair point, the user clicks the mouse on the SAVE OAP command box. If there is already a point at the crosshair location, an error message is issued.

DELETE OAP - This option is selectable only if the user enters the RADR menu from the RGEN menu. Selecting this option allows the user to delete any OAP. To delete an OAP, the user clicks on the DELETE OAP option with the mouse and is then prompted to position the cursor on the OAP to be deleted. The cursor must be within one nautical mile of the OAP in order for it to be deleted.

Graphic Input Mode (not an option) - The Graphic Input Mode for the RADR menu allows the user to move the crosshair without changing the prediction. Moving the crosshair will change the

CHECKPOINT crosshair and the CHECKPOINT TACAN if there is/was a
TACAN for that location, the ID, RG (range) and BRG (bearing). To
use the Graphic Input Mode, simply click the mouse at the
position you desire to relocate the crosshair.

REFERENCES

1)   Digital Equipment Corporation, "LA210 Letterprinter User Guide," (EK-LA210-UG), (UNCLASSIFIED).

2)   Digital Equipment Corporation, "Microvax II^{TM} Hardware Information," Order Number ZNAAB-GZ, 1985, (UNCLASSIFIED).

3)   Graftel, "Preliminary VP240 User's Manual," Dwg. No. 6005910E, 1987, (UNCLASSIFIED).

4)   Systems control Technology, "FLAPS Final Report," September 30, 1987, (UNCLASSFIED).

5)   Systems Control Technology, "TIPS Data Base Administrator's Manual/Data Base Specification Manual," August 1988, (UNCLASSIFIED).

GLOSSARY

AGL---------------------------Above Ground Level

CHUM--------------------------Information which has been gathered by
    the Defense Mapping Agency since the map was last
    published. Chart updates in the TIPS display menu are made
    from CHUM data.

CMF---------------------------Combat Mission Folder

Command Box-------------------A rectangular box on TIPS menus that are
    able to be selected with the cursor. Command boxes are
    blue, red, green or black depending on their function.

Cursor------------------------The TIPS cursor is a small white cross.
    It is a point of reference on the screen which the user
    controls by moving the mouse. When you press any one of
    the buttons on the mouse, the screen position of the cursor
    is passed to the program which takes the appropriate
    action.

Danger------------------------A measure of the probability of attrition
    from threats as a function of latitude, longitude and
    altitude (AGL).

Data Base Administrator-Maintains the TIPS data base using the
    FLAPS and SUPR programs.

DME---------------------------(Distance Measuring Equipment) Refers to
    the measured distance in nautical miles between a route
    point and a TACAN location.

Doghouse----------------------Doghouse-shaped objects on a TIPS' CMFR
    maps containing information specific to a leg.

Doghouse Tags-----------------A tag on TIPS' CMFR maps containing
    information specific to a waypoint.

EC ROZ------------------------Restricted Operating Zone dedicated to EC
    aircraft.

Egress------------------------The part of the route between the first
    or only target and the recovery base.

FLOT--------------------------Forward Line of Our Own Troops

Form 691----------------------Standard military flight plan which lists
    the points along the route.

FUP---------------------------Final Update Point

GS----------------------------Ground Speed

IFF-OFF----------------Identification If Friend or Foe - point
        at which IFF is turned off.

IFF-ON-----------------Identification If Friend or Foe - point
        at which IFF os turned on.

Ingress----------------The part of the route between the take-
        off base and the first target.

IP---------------------Initial Point

Known Point------------Locations which the Data Base
        Administrator has inserted into TIPS' data base. These
        correspond to good visual references for the UK and Western
        Europe. If the Data Base Administrator has inserted such
        points, the planner can refer to them by typing in the name
        of the point.

LLTR-------------------(Low Level Transit Route) A suggested
        "safe" route for friendly aircraft to fly across the FLOT
        between hostile and friendly territory.

Menu-------------------Displays in TIPS that provide two or more
        options from which the user is to make a selection.

Mike Point-------------One of the points that make up the LLTRs
        and TCORs.

Mission Planner--------The person using TIPS.

Mouse------------------A device used with the graphics terminal.
        It is used in the TIPS program to control graphics input
        and to input menu responses.

MSL--------------------Mean Sea Level - method of designating
        altitude.

OAP--------------------Offset Aim Point

Radial-----------------Heading outbound from a TACAN.

SCL--------------------Standard Configuration Load

Selected Waypoint------The waypoint on the route that serves as
        a point of reference for making changes to the route. This
        waypoint has its Form 691 information displayed on the RGEN
        menu. It is denoted by a blinking pink circle around the
        waypoint.

SID--------------------Standard Instrument Departure

SUPR--------------------Statespace Update Program created by SCT, Inc. This program is used for processing of threat information into an array known as the statespace.

TACAN-------------------Navigational aid.

TAS---------------------True Airspeed

TCOR--------------------Transit Corridor Network - suggested routing through friendly territory.

TIPS--------------------Tactical Interim Planning Software created by SCT, Inc.

TIPSDB------------------A software program created by SCT, Inc. Used to manage the TIPS data base files.

UTM---------------------Universal Transverse Mercator - geographic coordinate system.

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