

A Publication of the
**National Wildfire
Coordinating Group**

Sponsored by
United States
Department of Agriculture

United States
Department of the Interior

National Association of
State Foresters



PMS 438-4
NFES 2184

Fire Behavior Worksheets for the HP-71B Calculator

NOVEMBER 1991

Additional copies of this publication may be ordered from:

**Bolse Interagency Fire Center
ATTN: Supply
3905 Vista Avenue
Bolse, Idaho 83705**

Order NFES #2184

OUTPUT TABLES

SHEET ____ OF ____

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

HP-71B FIRE BEHAVIOR PROGRAM STRUCTURE

LEVEL 1

LEVEL 2

LEVEL 3

FUEL MODEL

DIRECT

SIZE
SCORCH
MAP
TWO

MAP

CONTAIN

SIZE

MAP

CONTAIN

SPOT

MAP

SCORCH

IGNITE

MOISTURE

MAP

SLOPE

WIND

RELATIVE HUMIDITY

PRINTER

QUIT

MAIN

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

DIRECT MAP - WIND - TWO - SLOPE WORKSHEET

SHEET _____ OF _____

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

DIRECT MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, RUN, QUIT, SIZE, SCORCH, MAP, TWO)

INPUT (INPUT, LIST)

0	----	PROJECTION POINT	_____
1	MODEL #	FUEL MODEL NUMBER (1-99)	_____
2	1H	1- H FUEL MOISTURE [1-60%]	_____
3	10H	¹ 10- H FUEL MOISTURE [1-60%]	_____
4	100H	¹ 100- H FUEL MOISTURE [1-60%]	_____
5	HERB	¹ LIVE HERB MOISTURE [30-300%]	_____
6	WOOD	¹ LIVE WOODY MOISTURE [30-300%]	_____
7	MFWS	MIDFLAME WINDSPEED [0-99 MI/H]	_____
8	SLP	SLOPE [0-100%/ 0-45 DEGREES]	_____
9	WDIR	² DIRECTION OF WIND VECTOR, DEG. CLOCK- WISE FROM UPHILL [0-360 DEGREES]	_____
	PREDICT AT MAX	(Y/N)	_____
10	SDIR	DIRECTION OF SPREAD CALC., DEG. CLOCKWISE FROM UPHILL OR FROM WIND VECTOR IF SLOPE IS ZERO. [0-360 DEGREES]	_____

OUTPUT (RUN)

0	NO MORE TABLES	
1	ROS	RATE OF SPREAD CH/H
2	H/A	HEAT PER UNIT AREA BTU/FT ²
3	FLI	FIRELINE INTENSITY BTU/FT/S
4	FL	FLAME LENGTH FT
5	RI	REACTION INTENSITY BTU/FT ² /MIN
6	EWS	EFFECTIVE WINDSPEED IN DIRECTION SDIR MI/H
7	MAXD	³ DIRECTION OF MAXIMUM SPREAD, DEG. CLOCK- WISE FROM UPHILL DEGREES

¹ INPUT ONLY IF CORRESPONDING FUEL LOAD IS NOT ZERO.² INPUT ONLY IF MIDFLAME WINDSPEED (MFWS) AND SLOPE (SLP) ARE NOT ZERO.³ OUTPUT ONLY IF CALCULATIONS ARE IN DIRECTION OF MAXIMUM SPREAD.**MAP MODULE**

(KEYWORDS: (INPUT, LIST, RUN, QUIT)

LIST NUMBER _____

INPUT (INPUT, LIST)

0	----	PROJECTION POINT	_____
1	SCL OPT	SCALE OPTION (1 OR 2)	_____
		1 - REPRESENTATIVE FRACTION	
		2 - INCHES PER MILE	
2	RF/1000	¹ REPRESENTATION FRACTION/1000 (1-500)	_____
		E.G., RF OF 1/24000=24	
3	IN/MI	² INCHES PER MILE (.0625-8)	_____
8	TIME	ELAPSED TIME [1-8H]	_____

OUTPUT (RUN)

1	MFSD	FORWARD SPREAD DISTANCE ON MAP (UNITS OPT = 1 OR 3)	INCHES	_____
2	MBSD	BACKING SPREAD DISTANCE ON MAP (SIZE LINKED ONLY)	INCHES	_____
3	MMXW	MAXIMUM FIRE WIDTH ON MAP (SIZE LINKED ONLY)	INCHES	_____

¹ INPUT ONLY FOR SCALE OPTION = 1
² INPUT ONLY FOR SCALE OPTION = 2

WIND ADJUSTMENT MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0	----	PROJECTION POINT	_____
1	20' W	20-FT WINDSPEED [0-99 MPH]	_____
2	EXPOSURE	EXPOSURE TO WIND (1-5)	_____
		1 = UNSHELTERED	
		2 = PARTIALLY SHELTERED	
		3 = FULLY SHELTERED, OPEN STAND.	
		4 = FULLY SHELTERED, CLOSED STAND.	
		5 = ENTER WIND ADJUST- MENT FACTOR	
3	WAF	¹ WIND ADJUSTMENT FACTOR (0-1)	_____
4	MODEL #	² FUEL MODEL NUMBER (1-99)	_____

OUTPUT (RUN)

1	MFWS	MIDFLAME WINDSPEED	MI/H	_____
---	------	--------------------	------	-------

¹ INPUT ONLY FOR EXPOSURE = 5.² INPUT ONLY FOR EXPOSURE = 1.

FINE DEAD FUEL MOISTURE CALCULATIONS

A.	PROJECTION POINT	_____	_____	_____	_____
B.	DAY OR NIGHT (D/N)	D/N	D/N	D/N	D/N
DAY TIME CALCULATIONS					
C.	DRY BULB TEMPERATURE, °F	_____	_____	_____	_____
D.	RELATIVE HUMIDITY, %	_____	_____	_____	_____
E.	REFERENCE FUEL MOISTURE, % (FROM TABLE A)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
F.	MONTH	_____	_____	_____	_____
G.	UNSHADED OR SHADED (U/S)	U/S	U/S	U/S	U/S
H.	TIME	_____	_____	_____	_____
I.	ELEVATION CHANGE	B/L/A	B/L/A	B/L/A	B/L/A
	B = 1000' - 2000' BELOW SITE L = ± 1000' OF SITE LOCATION A = 1000' - 2000' ABOVE SITE	_____	_____	_____	_____
J.	ASPECT	_____	_____	_____	_____
K.	SLOPE	_____	_____	_____	_____
L.	FUEL MOISTURE CORRECTION, % (FROM TABLE B, C, OR D)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
M.	FINE DEAD FUEL MOISTURE, % (LINE E + LINE I)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

NIGHT TIME CALCULATIONS

N.	DRY BULB TEMPERATURE, °F	_____	_____	_____	_____
O.	RELATIVE HUMIDITY, %	_____	_____	_____	_____
P.	REFERENCE FUEL MOISTURE, % (FROM TABLE E)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	USE TABLE F ONLY IF A STRONG INVERSION EXISTS AND A CORRECTION MUST BE MADE FOR ELEVATION OR ASPECT CHANGE.	_____	_____	_____	_____
Q.	ASPECT OF PROJECTION POINT	_____	_____	_____	_____
R.	ASPECT OF SITE LOCATION	_____	_____	_____	_____
S.	TIME	_____	_____	_____	_____
T.	ELEVATION CHANGE	B/L/A	B/L/A	B/L/A	B/L/A
	B = 1000' - 2000' BELOW SITE L = ± 1000' OF SITE LOCATION A = 1000' - 2000' ABOVE SITE	_____	_____	_____	_____
U.	CORRECTION FOR PROJECTION POINT LOCATION (FROM TABLE F)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
V.	CORRECTION FOR SITE LOCATION (L) (FROM TABLE F)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
W.	FUEL MOISTURE CORRECTION, % (LINE U - LINE V)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
X.	FINE DEAD FUEL MOISTURE, % (LINE P + LINE W)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

TWO MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

PASSED FROM DIRECT (LIST)

0	_____	PROJECTION POINT	_____
1	MODEL1	FIRST MODEL RUN BY DIRECT	_____
2	MODEL2	SECOND MODEL RUN BY DIRECT	_____
3	ROS1	SPREAD RATE FOR FIRST MODEL	_____
4	ROS2	SPREAD RATE FOR SECOND MODEL	_____

INPUT (INPUT, LIST)

5	COV1	PERCENT AREA COVERAGE [20 - 80%] FIRST MODEL	_____
---	------	---	-------

OUTPUT (RUN)

1	ROS	RATE OF SPREAD	CH/H	_____
---	-----	----------------	------	-------

SLOPE MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, RUN, QUIT)

FROM POINT _____ TO POINT _____

INPUT (INPUT, LIST)

0	-----	PROJECTION POINT	_____
1	SCL OPT	SCALE OPTION (1 OR 2)	_____
		1 = REPRESENTATIVE FRACTION	
		2 = INCHES PER MILE	
2	RF/1000	1 REPRESENTATIVE FRACTION/1000 (1 - 500)	_____
		E.G., RF OF 1/24000 = 24	
3	IN/MI	2 INCHES PER MILE (.0625 - 8 IN)	_____
4	CON INT	CONTOUR INTERVAL (10 - 500 FT)	_____
5	MAP DIST	MAP DISTANCE (.1 - 10 IN)	_____
6	# INTVLS	NUMBER OF CONTOUR INTERVALS (1 - 100)	_____

OUTPUT (RUN)

1	SLP %	SLOPE STEEPNESS	%	_____
2	SLP DEG	SLOPE STEEPNESS	DEGREES	_____
3	EL DIFF	ELEVATION CHANGE	FEET	_____
4	HORIZ DIST	HORIZONTAL DISTANCE	FEET	_____

1 INPUT ONLY FOR SCALE OPTION = 1

2 INPUT ONLY FOR SCALE OPTION = 2

DIR SCORCH - WIND - SLOPE - RH - WORKSHEET

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____ SHEET _____ OF _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ TO _____

DIRECT MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, BUN, QUIT, SIZE, SCORCH, MAP, TWO)

INPUT (INPUT, LIST)

PROJECTION POINT

MODEL # FUEL MODEL NUMBER (1-99)

1H 1-H FUEL MOISTURE [1-60%]

3 10H 10-H FUEL MOISTURE [1-60%]

4 100H 100-H FUEL MOISTURE [1-60%]

5 HERB LIVE HERB MOISTURE [30-300%]

6 WOOD LIVE WOODY MOISTURE [30-300%]

7 MFWS MIDFLAME WINDSPEED [0-99 MI/H]

8 SLP SLOPE [0-100%]

9 WDIR DIRECTION OF WIND VECTOR, DEG. CLOCK- [0-360 DEGREES]

PREDICT AT MAX WISE FROM UPHILL

DIRECTION OF SPREAD [0-360 DEGREES]

CALC. DEG. CLOCKWISE FROM UPHILL OR FROM WIND VECTOR IF SLOPE IS ZERO.

OUTPUT (BUN)

NO MORE TABLES

1 ROS RATE OF SPREAD CH/H

2 H/A HEAT PER UNIT AREA BTU/FT²

3 FLI FIRELINE INTENSITY BTU/FT/S

4 FL FLAME LENGTH FT

5 RI REACTION INTENSITY BTU/FT² / MIN

6 EWS EFFECTIVE WINDSPEED MI/H

IN DIRECTION SDIR

3 DIRECTION OF MAXIMUM SPREAD, DEG. CLOCK- WISE FROM UPHILL

1 INPUT ONLY IF CORRESPONDING FUEL LOAD IS NOT ZERO.
2 INPUT ONLY IF MIDFLAME WINDSPEED (MFWS) AND SLOPE (SLP) ARE NOT ZERO.
3 OUTPUT ONLY IF CALCULATIONS ARE IN DIRECTION OF MAXIMUM SPREAD.

5

SCORCH MODULE

(KEYWORDS: INPUT, LIST, BUN, QUIT)

INPUT (INPUT, LIST)

0 PROJECTION POINT

1 TEMP AMBIENT AIR TEMPERATURE [33-120 °F]

2 FL FLAME LENGTH [1-20 FT]

3 MFWS MIDFLAME WINDSPEED [0-10 MI/H]

OUTPUT (BUN)

1 SCHT SCORCH HEIGHT

FEET

1 INPUT ONLY IF SCORCH IS USED AS AN INDEPENDENT MODULE.

OUTPUT TABLES

LIST NUMBER

TABLE NO.

TABLE ITEM

ROW ITEM

COL. ITEM

PROJECTION POINT

COLUMN VALUES:

ROW VALUE

TABLE VALUES

1.

2.

3.

ROW NO.

TABLE ITEM

ROW ITEM

COL. ITEM

PROJECTION POINT

COLUMN VALUES:

ROW VALUE

TABLE VALUES

1.

2.

3.

NOVEMBER 1991

WIND ADJUSTMENT MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0	-----	PROJECTION POINT	_____
1	20' W	20-FT WINDSPEED	[0 - 99 MPH] _____
2	EXPOSURE	EXPOSURE TO WIND	(1 - 5) _____
		1 - EXPOSED	
		2 - PARTIALLY SHELTERED	
		3 - FULLY SHELTERED, OPEN STAND	
		4 - FULLY SHELTERED, CLOSED STAND	
		5 - ENTER WIND ADJUSTMENT FACTOR	
3	WAF	1 WIND ADJUSTMENT FACTOR	(0-1) _____
4	MODEL #	2 FUEL MODEL NUMBER	(1 - 99) _____

OUTPUT (RUN)

1	MFWS	MIDFLAME WINDSPEED	MPH _____
---	------	--------------------	-----------

¹ INPUT ONLY FOR EXPOSURE = 5.

² INPUT ONLY FOR EXPOSURE = 1.

SLOPE MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, RUN, QUIT)

FROM POINT _____ TO POINT _____

INPUT (INPUT, LIST)

0	-----	PROJECTION POINT	_____
1	SCL OPT	SCALE OPTION	(1 OR 2) _____
		1 = REPRESENTATIVE FRACTION	
		2 = INCHES PER MILE	
2	RF/1000	1 REPRESENTATIVE FRACTION/1000	(1 - 500) _____
		E.G., RF OF 1/24000 = 24	
3	IN/MI	2 INCHES PER MILE	(.0625 - 8 IN) _____
4	CON INT	CONTOUR INTERVAL	(10 - 500 FT) _____
5	MAP DIST	MAP DISTANCE	(.1 - 10 IN) _____
6	#INTVLS	NUMBER OF CONTOUR INTERVALS	(1 - 100) _____

OUTPUT (RUN)

1	SLP %	SLOPE STEEPNESS	% _____
2	SLP DEG	SLOPE STEEPNESS	DEGREES _____
3	EL DIFF	ELEVATION CHANGE	FEET _____
4	HORIZ DIST	HORIZONTAL DISTANCE	FEET _____

¹ INPUT ONLY FOR SCALE OPTION = 1

² INPUT ONLY FOR SCALE OPTION = 2

RH MODULE

(KEYWORDS: INPUT, LIST, QUIT)

INPUT (INPUT, LIST)

0	-----	PROJECTION POINT	_____
1	DRYB	DRY BULB TEMPERATURE	[33 - 120 °F] _____
2	WETB	WET BULB TEMPERATURE	[0 - 120 °F] _____
3	EL	ELEVATION	[0 - 12000 FT] _____

OUTPUT (RUN)

1	%RH	RELATIVE HUMIDITY	% _____
2	DEWP	DEW POINT	°F _____

ERROR CODES:

-888 = WET BULB TEMPERATURE GREATER THAN DRY BULB TEMPERATURE.

-999 = DEW POINT TOO COLD FOR VALID CALCULATIONS.

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINTS _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

SPOT - MAP - IGNITE WORKSHEET

SHEET _____ OF _____

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____
DATE _____ TIME _____
PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

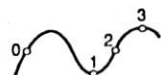
SPOT MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, CONTAIN, RUN, MAP, QUIT)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____
1 BRAND SRC FIREBRAND SOURCE (1-3) _____
1 - TORCHING TREES 3 - WIND DRIVEN
2 - BURNING PILES SURFACE FIRE
2 MCHT MEAN COVER HEIGHT [0-300 FT] _____
3 20'W 20-FT WINDSPEED [0-99 MPH] _____
4 RVEL RIDGE - TO - VALLEY ELEVATION DIFFERENCE [0-4000 FT] _____
5 RVHD RIDGE - TO - VALLEY HORIZONTAL DISTANCE [0-4 MI] _____
6 SRC LOC SPOTTING SOURCE LOCATION (0-3) _____



0 - MIDSLOPE, WINDWARD SIDE
1 - VALLEY BOTTOM
2 - MIDSLOPE, LEEWARD SIDE
3 - RIDGETOP

7 TREE SP 1 TREE SPECIES (1-6) _____
1 - ENGELMANN SPRUCE 3 - HEMLOCK 5 - WHITE PINE
2 - DOUGLAS-FIR 4 - PONDEROSA, LODGEPOLE PINE 6 - BALSAM PINE, GRAND FIR
8 DBH 1 TORCHING TREE DBH [5-40 INCHES] _____
9 TRHT 1 TORCHING TREE HEIGHT [10-300 FT] _____
10 #TR 1 NUMBER OF TORCHING TREES [1-30] _____
11 FLHT 2 CONTINUOUS FLAME HEIGHT [1-100 FT] _____
12 FL 3 FLAME LENGTH [1-50 FT] _____
13 MODEL # 3 FUEL MODEL (1-99) _____
14 HERB 4 HERBACEOUS MOISTURE [30-300%] _____

OUTPUT (RUN)

1 SPOT MAXIMUM SPOTTING DISTANCE MI _____

- 1 INPUT ONLY FOR FIREBRAND SOURCE = 1 (TORCHING TREE OPTION).
2 INPUT ONLY FOR FIREBRAND SOURCE = 2 (BURNING PILE OPTION).
3 INPUT ONLY FOR FIREBRAND SOURCE = 3 (WIND-DRIVEN SURFACE FIRE OPTION).
4 INPUT ONLY FOR DYNAMIC FUEL MODELS WITH A HERBACEOUS FUEL LOAD.

MAP MODULE

LIST NUMBER _____

(KEYWORDS: (INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINTS _____
1 SCL OPT SCALE OPTION (1 OR 2) _____
1 - REPRESENTATIVE FRACTION
2 - INCHES PER MILE
2 RF/1000 1 REPRESENTATION (1-500) _____
FRACTION/1000
E.G., RF OF 1/24000=24
3 IN/MI 2 INCHES PER MILE (.0625-8) _____
4 UNITS OPT UNITS OPTION _____
6 SPOT SPOT DISTANCE [.1-10 MI] _____

OUTPUT (RUN)

1 MSPT FORWARD SPOT DISTANCE ON MAP (UNITS OPT = 2) INCHES _____

- 1 INPUT ONLY FOR SCALE OPTION = 1
2 INPUT ONLY FOR SCALE OPTION = 2

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1. _____
2. _____
3. _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1. _____
2. _____
3. _____

IGNITE MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0 ----- PROJECTION POINT _____

1 TEMP AMBIENT AIR TEMPERATURE [33 - 120°F] _____

2 1H 1 - H FUEL MOISTURE [1 - 60%] _____

3 SHAD SHADE [0 - 100%] _____

OUTPUT (RUN)

1 P (I) PROBABILITY OF IGNITION % _____

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

FINE DEAD FUEL MOISTURE CALCULATIONS

A. PROJECTION POINT _____

B. DAY OR NIGHT (D/N) _____ D/N _____ D/N _____ D/N _____

DAY TIME CALCULATIONS

C. DRY BULB TEMPERATURE, °F _____

D. RELATIVE HUMIDITY, % _____

E. REFERENCE FUEL MOISTURE, %
(FROM TABLE A) _____

F. MONTH _____

G. UNSHADED OR SHADED (U/S) _____ U/S _____ U/S _____ U/S _____

H. TIME _____

I. ELEVATION CHANGE _____ B/L/A _____ B/L/A _____ B/L/A _____ B/L/A _____

B = 1000' - 2000' BELOW SITE
L = ± 1000' OF SITE LOCATION
A = 1000' - 2000' ABOVE SITE

J. ASPECT _____

K. SLOPE _____

L. FUEL MOISTURE CORRECTION,
% (FROM TABLE B, C, OR D) _____

M. FINE DEAD FUEL MOISTURE,
% (LINE E + LINE I) _____

NIGHT TIME CALCULATIONS

N. DRY BULB TEMPERATURE, °F _____

O. RELATIVE HUMIDITY, % _____

P. REFERENCE FUEL MOISTURE,
% (FROM TABLE E) _____

USE TABLE F ONLY IF A STRONG INVERSION
EXISTS AND A CORRECTION MUST BE MADE
FOR ELEVATION OR ASPECT CHANGE.

Q. ASPECT OF PROJECTION POINT _____

R. ASPECT OF SITE LOCATION _____

S. TIME _____

T. ELEVATION CHANGE _____ B/L/A _____ B/L/A _____ B/L/A _____ B/L/A _____

B = 1000' - 2000' BELOW SITE
L = ± 1000' OF SITE LOCATION
A = 1000' - 2000' ABOVE SITE

U. CORRECTION FOR PROJECTION POINT
LOCATION (FROM TABLE F) _____

V. CORRECTION FOR SITE LOCATION (L)
(FROM TABLE F) _____

W. FUEL MOISTURE CORRECTION, %
(LINE U - LINE V) _____

X. FINE DEAD FUEL MOISTURE, %
(LINE P + LINE W) _____

SIZE - MAP - CONTAIN

SHEET _____ OF _____

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____
 DATE _____ TIME _____
 PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

SIZE MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, ¹CONTAIN, RUN, MAP, QUIT)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____
 1 ROS ² RATE OF SPREAD [1-500 CH/H] _____
 2 EWS ² EFFECTIVE WINDSPEED [0-99 MI/H] _____
 3 ET ³ ELAPSED TIME [1 - 8H] _____

OUTPUT (RUN)

0 NO MORE TABLES
 1 AREA AREA ACRES _____
 2 PER PERIMETER CH _____
 3 LW LENGTH-TO WIDTH RATIO _____
 4 FSD FORWARD SPREAD DISTANCE CH _____
 5 BSD BACKING SPREAD DISTANCE CH _____
 6 MXW MAXIMUM FIRE WIDTH CH _____

¹ SIZE CAN LINK TO CONTAIN ONLY IF LINKED TO DIRECT.

² INPUT ONLY WHEN SIZE IS USED AS AN INDEPENDENT MODULE.

³ ONLY INPUT WHEN LINKED FROM DIRECT.

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

MAP MODULE

LIST NUMBER _____

(KEYWORDS: (INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0 ----- PROJECTION POINT _____
 1 SCL OPT SCALE OPTION (1 OR 2) _____
 1- REPRESENTATIVE FRACTION
 2- INCHES PER MILE
 2 RF/1000 ¹ REPRESENTATION (1-500) _____
 FRACTION/1000
 E.G., RF OF 1/24000=24
 3 IN/MI ² INCHES PER MILE (.0625-8) _____
 4 UNITS OPT UNITS OPTION (1-3) _____
 1 - SPREAD DISTANCE
 2 - SPOTTING DISTANCE
 3 - RATE OF SPREAD
 5 DIST ³ SPREAD DISTANCE [0-1000 CH] _____
 6 SPOT ⁴ SPOTTING DISTANCE [1-10 MI] _____
 7 ROS ⁵ RATE OF SPREAD [1-500 CH/H] _____
 8 TIME ⁵ ELAPSED TIME [1-8H] _____
 5 FSD ⁶ FORWARD SPREAD DISTANCE CH _____
 6 BSD ⁶ BACKING SPREAD DISTANCE CH _____
 7 MXW ⁶ MAXIMUM FIRE WIDTH CH _____

OUTPUT (RUN)

1 MFSD FORWARD SPREAD DISTANCE ON MAP (UNITS OPT = 1 OR 3) INCHES _____
 1 MSPT SPOTTING DISTANCE ON MAP (UNITS OPT = 2) INCHES _____
 2 MBSD BACKING SPREAD DISTANCE ON MAP (SIZE LINKED ONLY) INCHES _____
 3 MMXW MAXIMUM FIRE WIDTH ON MAP (SIZE LINKED ONLY) INCHES _____

1 INPUT ONLY FOR SCALE OPTION = 1.
 2 INPUT ONLY FOR SCALE OPTION = 2.
 3 INPUT ONLY FOR UNITS OPTION = 1.
 4 INPUT ONLY FOR UNITS OPTION = 2.
 5 INPUT ONLY FOR UNITS OPTION = 3.
 6 PASSED FROM SIZE FOR LINKED RUN ONLY. NO INPUT IS NEEDED.

CONTAIN MODULE

LIST NUMBER _____

INPUT (INPUT, LIST) (KEYWORDS: INPUT, LIST, RUN, QUIT)

0	----	PROJECTION POINT	_____
1	RUN OPT	(1 OR 2)	_____
		1 = CALCULATE TOTAL LINE BUILDING RATE	
		2 = CALCULATE BURNED AREA	
2	ATTACK OPT	(1 OR 2)	_____
		1 = HEAD	
		2 = REAR	
3	ROS	1 RATE OF SPREAD	[1-500 CH/H] _____
4	AREA	1 INITIAL FIRE AREA	[1-100 ACRES] _____
5	LW	1 LENGTH - TO-WIDTH RATIO	[1-5] _____
6	BAT	2 BURNED AREA TARGET	[1-2000 ACRES] _____
7	TLBR	3 TOTAL LINE BUILDING RATE	[1-800 CH/H] _____

OUTPUT (RUN)

1	PER	TOTAL LENGTH OF LINE	CHAINS	_____
2	TIME	CONTAINMENT TIME	HOURS	_____
3	FFS	4 FINAL FIRE SIZE	ACRES	_____
3	TLBR	5 TOTAL LINE BUILDING RATE	CH/H	_____
4	MAXA	5 MAXIMUM AREA CALCULABLE	ACRES	_____
5	MINA	5 MINIMUM AREA CALCULABLE	ACRES	_____

ERROR CODES:

- 1 = BURNED AREA TARGET TOO LARGE, CANNOT CALCULATE SLOW ENOUGH LINE BUILDING RATE.
- 2 = LINE BUILDING RATE TOO SLOW TO CATCH FIRE.
- 3 = LW RATIO TOO LARGE.
- 4 = BURNED AREA TARGET TOO CLOSE TO INITIAL FIRE SIZE.
- 5 = LINE BUILDING RATE TOO FAST.
- 1 INPUT ONLY WHEN CONTAIN IS USED AS AN INDEPENDENT MODULE.
- 2 INPUT ONLY FOR RUN OPTION = 1 (CALCULATE TOTAL LINE BUILDING RATE).
- 3 INPUT ONLY FOR RUN OPTION = 2 (CALCULATE BURNED AREA TARGET).
- 4 OUTPUT ONLY FOR RUN OPTION = 2.
- 5 OUTPUT ONLY FOR RUN OPTION = 1.

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____	TABLE ITEM _____	ROW ITEM _____	COL ITEM _____
PROJECTION POINT _____ COLUMN VALUES: _____			
ROW NO. _____	ROW VALUE _____	TABLE VALUES	
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

TABLE NO. _____	TABLE ITEM _____	ROW ITEM _____	COL ITEM _____
PROJECTION POINT _____ COLUMN VALUES: _____			
ROW NO. _____	ROW VALUE _____	TABLE VALUES	
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

TABLE NO. _____	TABLE ITEM _____	ROW ITEM _____	COL ITEM _____
PROJECTION POINT _____ COLUMN VALUES: _____			
ROW NO. _____	ROW VALUE _____	TABLE VALUES	
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

MOISTURE

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

MOISTURE MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0	PROJECTION POINT	_____
1	RUN OPT	RUN OPTION (1 OR 2) 1 - BURN TIME CALCULATIONS 2 - HOURLY CALCULATIONS
TIME AND LOCATION		
2	BURN MONTH	MONTH OF BURN (1-12)
3	BURN DAY	DAY OF BURN (1-31)
4	LATITUDE	LATITUDE OF FIRE (-90 TO 90 DEGREES)
5	BURN TIME	TIME OF BURN (0-2359 H)
FUEL MODEL		
6	MODEL #	FUEL MODEL NUMBER (1-99)
SLOPE, ELEVATION, ASPECT		
11	SLP	SLOPE STEEPNESS [0-100% / 0-45 DEGREES]
12	ELFL	ELEVATION OF FIRE LOCATION [0-12000 FT]
	RH OBS AT FIRE	(Y/N)
13	ELOB	ELEVATION OF T&RH OBSERVATIONS (0-12000 FT)
14	ASPECT	ASPECT OF FIRE LOCATION (0-360 DEGREES)
0 - NORTH 180 - SOUTH 90 - EAST 270 - WEST		
TIMBER OVERSTORY DESCRIPTION		
15	CCLO	CROWN CLOSURE [0-100%]
16	FOLIAGE	FOLIAGE PRESENCE (0 OR 1) 0 - ABSENT 1 - PRESENT
17	SHADE TOL	SHADE TOLERANCE (0 OR 1) 0 - INTOLERANT 1 - TOLERANT
18	DOM TYPE	DOMINANT TREE TYPE (1 OR 2) 1 - CONIFEROUS 2 - DECIDUOUS
19	AVTH	AVERAGE TREE HEIGHT [10-300 FT]
20	H/H	CROWN HEIGHT/TREE HEIGHT RATIO [1-1]
21	H/D	CROWN HEIGHT/CROWN DIAMETER RATIO [2-5]

LY AFTERNOON WEATHER

22	14T	BURN DAY 1400 TEMPERATURE	[33-120 °F]	_____
23	14RH	BURN DAY 1400 RELATIVE HUMIDITY	[1-100%]	_____
24	14W	BURN DAY 1400 20-FT WINDSPEED	[0-99 MI/H]	_____
25	14CC	BURN DAY CLOUD COVER	[0-100%]	_____
26	14HZ	BURN DAY 1400 HAZINESS	[1-4]	_____

1 - VERY CLEAR SKY
2 - AVERAGE CLEAR FOREST ATMOSPHERE
3 - MODERATE BLUE HAZE
4 - DENSE HAZE-MODERATE SMOKE

SUNSET WEATHER

27	SST	SUNSET TEMPERATURE	[33-120 °F]	_____
28	SSHR	SUNSET RELATIVE HUMIDITY	[1-100%]	_____
29	SSW	SUNSET 20-FT WINDSPEED	[0-99 MI/H]	_____
30	SSCC	SUNSET CLOUD COVER	[0-100%]	_____

SUNRISE WEATHER

31	SRT	SUNRISE TEMPERATURE	[33-120 °F]	_____
32	SRRH	SUNRISE RELATIVE HUMIDITY	[1-100%]	_____
33	SRW	SUNRISE 20-FT WINDSPEED	[0-99 MI/H]	_____
34	SRCC	SUNRISE CLOUD COVER	[0-100%]	_____

BURN TIME WEATHER

35	BT	BURN TIME TEMPERATURE	[33-120 °F]	_____
36	BTRH	BURN TIME RELATIVE HUMIDITY	[1-100%]	_____
37	BTW	BURN TIME 20-FT WINDSPEED	[0-99 MI/H]	_____
38	BTCC	BURN TIME CLOUD COVER	[0-100%]	_____
39	BTHZ	BURN TIME HAZINESS	[1-4]	_____

1 - VERY CLEAR SKY
2 - AVERAGE CLEAR FOREST ATMOSPHERE
3 - MODERATE BLUE HAZE
4 - DENSE HAZE-MODERATE SMOKE

FUEL LEVEL WIND ADJUSTMENT

40	EXPOSURE	EXPOSURE OF FUELS TO WIND (1-5) 1 - UNEXPOSED 2 - PARTIALLY EXPOSED 3 - FULLY EXPOSED - OPEN STAND 4 - FULLY EXPOSED - CLOSED STAND 5 - DIRECT ENTRY OF WIND
41	WAF	WIND ADJUSTMENT FACTOR (0-1) EXPOSURE 5 ONLY

MOISTURE INITIALIZATION OPTION

43 MOIS OPT MOISTURE INITIALIZATION OPTION (1-5)

- 1 - FINE FUEL MOISTURE KNOWN FOR DAY BEFORE BURN
- 2 - NOT ALLOWED
- 3 - INCOMPLETE DATA; RAIN THE WEEK BEFORE BURN.
- 4 - INCOMPLETE DATA; NO RAIN THE WEEK BEFORE BURN
- 5 - INCOMPLETE DATA; WEATHER PATTERN CHANGING.

MOISTURE OPTION 1

44 FM-1 BURN DAY - 1 FINE FUEL MOISTURE [1 - 100%]

MOISTURE OPTION 3

51 RDAY NUMBER OF DAYS BEFORE BURN RAIN OCCURRED [1 - 7 DAYS]

52 RAIN RAIN AMOUNT, HUNDREDTHS OF AN INCH [0 - 400]

53 RDT 1400 TEMPERATURE ON RAIN DAY [33 - 120 °F]

54 SKY CODE SKY CONDITION FROM RAIN DAY - BURN DAY [1 - 3]

- 1 - CLEAR
- 2 - CLOUDY
- 3 - PARTLY CLOUDY

MOISTURE OPTION 4

NO ADDITIONAL INPUT

MOISTURE OPTION 5

55 TD - 1 BURN DAY - 1 1400 TEMPERATURE [33 - 120 °F]

56 RD - 1 BURN DAY - 1 1400 RELATIVE HUMIDITY [1 - 100%]

57 WD - 1 BURN DAY - 1 1400 20 FT WINDSPEED [0 - 99]

58 CD - 1 BURN DAY - 1 1400 CLOUD COVER [0 - 100%]

59 WTHR WEATHER CONDITION PRIOR TO BURN DAY - 1 [1 - 3]

- 1 - HOT AND DRY
- 2 - COOL AND WET
- 3 - BETWEEN 1 AND 2

OUTPUT (RUN)

1 MOIS 1 - HOUR FUEL MOISTURE %

2 TEMP FUEL LEVEL TEMPERATURE °F

3 %RH FUEL LEVEL RELATIVE HUMIDITY %

4 SHAD PERCENT OF AREA SHADED %

5 P(I) PROBABILITY OF IGNITION %

HOURLY OUTPUT (RUN)

TIME FMOIST % FTEMP °F FRH %

14

15

16

17

18

19

20

21

22

23

24

1

2

3

4

5

6

7

8

9

10

11

12

BURN TIME

OUTPUT TABLES

SHEET ____ OF ____

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1. _____

2. _____

3. _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1. _____

2. _____

3. _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1. _____

2. _____

3. _____

HP-71B FIRE BEHAVIOR PROGRAM STRUCTURE

LEVEL 1

LEVEL 2

LEVEL 3

FUEL MODEL

DIRECT

SIZE
SCORCH
MAP
TWO

MAP

CONTAIN

SIZE

MAP

CONTAIN

SPOT

MAP

SCORCH

IGNITE

MOISTURE

MAP

SLOPE

WIND

RELATIVE HUMIDITY

PRINTER

QUIT

MAIN

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

DIRECT - MAP - WIND - TWO - SLOPE WORKSHEET

SHEET ____ OF ____

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

DIRECT MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, RUN, QUIT, SIZE, SCORCH, MAP, TWO)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____

1 MODEL # FUEL MODEL NUMBER (1-99) _____

2 1H 1- H FUEL MOISTURE [1-60%] _____

3 10H 10- H FUEL MOISTURE [1-60%] _____

4 100H 100- H FUEL MOISTURE [1-60%] _____

5 HERB 1 LIVE HERB MOISTURE [30-300%] _____

6 WOOD 1 LIVE WOODY MOISTURE [30-300%] _____

7 MFWS MIDFLAME WINDSPEED [0-99 MPH] _____

8 SLP SLOPE [0-100% / 0-45 DEGREES] _____

9 WDIR 2 DIRECTION OF WIND VECTOR, DEG. CLOCKWISE FROM UPHILL [0-360 DEGREES] _____

PREDICT AT MAX (Y/N) _____

10 SDIR DIRECTION OF SPREAD CALC., DEG. CLOCKWISE FROM UPHILL OR FROM WIND VECTOR IF SLOPE IS ZERO. [0-360 DEGREES] _____

OUTPUT (RUN)

0 NO MORE TABLES

1 ROS RATE OF SPREAD CH/H _____

2 R/A HEAT PER UNIT AREA BTU/FT² _____

3 FLP FIRELINE INTENSITY BTU/FT/S _____

4 FL FLAME LENGTH FT _____

5 RI REACTION INTENSITY BTU/FT /MIN _____

6 EWS EFFECTIVE WINDSPEED IN DIRECTION SDIR MPH _____

7 MAXD 3 DIRECTION OF MAXIMUM SPREAD, DEG. CLOCKWISE FROM UPHILL DEGREES _____

¹ INPUT ONLY IF CORRESPONDING FUEL LOAD IS NOT ZERO.

² INPUT ONLY IF MIDFLAME WINDSPEED (MFWS) AND SLOPE (SLP) ARE NOT ZERO.

³ OUTPUT ONLY IF CALCULATIONS ARE IN DIRECTION OF MAXIMUM SPREAD.

MAP MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

LIST NUMBER _____

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____

1 SCL OPT SCALE OPTION (1 OR 2) _____
1 - REPRESENTATIVE FRACTION
2 - INCHES PER MILE

2 RF/1000 ¹ REPRESENTATION (1-500) _____
FRACTION/1000
E.G., RF OF 1/24000=24

3 IN/MI ² INCHES PER MILE (.0625-8) _____

8 TIME ELAPSED TIME [1-8H] _____

OUTPUT (RUN)

1 MFSD FORWARD SPREAD DISTANCE INCHES _____
ON MAP
(UNITS OPT = 1 OR 3)

2 MBSD BACKING SPREAD DISTANCE INCHES _____
ON MAP
(SIZE LINKED ONLY)

3 MMXW MAXIMUM FIRE WIDTH ON INCHES _____
MAP (SIZE LINKED ONLY)
¹ INPUT ONLY FOR SCALE OPTION = 1
² INPUT ONLY FOR SCALE OPTION = 2

WIND ADJUSTMENT MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____

1 20' W 20-FT WINDSPEED [0-99 MPH] _____

2 EXPOSURE EXPOSURE TO WIND (1-5) _____
1 - UNSHELTERED
2 - PARTIALLY SHELTERED
3 - FULLY SHELTERED, OPEN STAND.
4 - FULLY SHELTERED, CLOSED STAND.
5 - ENTER WIND ADJUSTMENT FACTOR

3 WAF ¹ WIND ADJUSTMENT FACTOR (0-1) _____

4 MODEL # ² FUEL MODEL NUMBER (1-99) _____

OUTPUT (RUN)

1 MFWS MIDFLAME WINDSPEED MPH _____

¹ INPUT ONLY FOR EXPOSURE = 5.

² INPUT ONLY FOR EXPOSURE = 1.

FINE DEAD FUEL MOISTURE CALCULATIONS

A.	PROJECTION POINT	_____	_____	_____	_____
B.	DAY OR NIGHT (D/N)	D/N	D/N	D/N	D/N
DAY TIME CALCULATIONS					
C.	DRY BULB TEMPERATURE, °F	_____	_____	_____	_____
D.	RELATIVE HUMIDITY, %	_____	_____	_____	_____
E.	REFERENCE FUEL MOISTURE, % (FROM TABLE A)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
F.	MONTH	_____	_____	_____	_____
G.	UNSHADED OR SHADED (U/S)	U/S	U/S	U/S	U/S
H.	TIME	_____	_____	_____	_____
I.	ELEVATION CHANGE	B/L/A	B/L/A	B/L/A	B/L/A
B = 1000' - 2000' BELOW SITE L = ± 1000' OF SITE LOCATION A = 1000' - 2000' ABOVE SITE					
J.	ASPECT	_____	_____	_____	_____
K.	SLOPE	_____	_____	_____	_____
L.	FUEL MOISTURE CORRECTION, % (FROM TABLE B, C, OR D)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
M.	FINE DEAD FUEL MOISTURE, % (LINE E + LINE I)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

NIGHT TIME CALCULATIONS

N.	DRY BULB TEMPERATURE, °F	_____	_____	_____	_____
O.	RELATIVE HUMIDITY, %	_____	_____	_____	_____
P.	REFERENCE FUEL MOISTURE, % (FROM TABLE E)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
USE TABLE F ONLY IF A STRONG INVERSION EXISTS AND A CORRECTION MUST BE MADE FOR ELEVATION OR ASPECT CHANGE.					
Q.	ASPECT OF PROJECTION POINT	_____	_____	_____	_____
R.	ASPECT OF SITE LOCATION	_____	_____	_____	_____
S.	TIME	_____	_____	_____	_____
T.	ELEVATION CHANGE	B/L/A	B/L/A	B/L/A	B/L/A
B = 1000' - 2000' BELOW SITE L = ± 1000' OF SITE LOCATION A = 1000' - 2000' ABOVE SITE					
U.	CORRECTION FOR PROJECTION POINT LOCATION (FROM TABLE F)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
V.	CORRECTION FOR SITE LOCATION (L) (FROM TABLE F)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
W.	FUEL MOISTURE CORRECTION, % (LINE U - LINE V)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
X.	FINE DEAD FUEL MOISTURE, % (LINE P + LINE W)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

TWO MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

PASSED FROM DIRECT (LIST)

0	PROJECTION POINT	_____
1	MODEL1 FIRST MODEL RUN BY DIRECT	_____
2	MODEL2 SECOND MODEL RUN BY DIRECT	_____
3	ROS1 SPREAD RATE FOR FIRST MODEL	_____
4	ROS2 SPREAD RATE FOR SECOND MODEL	_____

INPUT (INPUT, LIST)

5	COV1 PERCENT AREA COVERAGE [20 - 80%] FIRST MODEL	_____
---	--	-------

OUTPUT (RUN)

1	ROS RATE OF SPREAD	CH/H	_____
---	--------------------	------	-------

SLOPE MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

FROM POINT _____ TO POINT _____

INPUT (INPUT, LIST)

0	PROJECTION POINT	_____
1	SCL OPT SCALE OPTION (1 OR 2)	_____
		1 = REPRESENTATIVE FRACTION
		2 = INCHES PER MILE
2	RF/1000 REPRESENTATIVE FRACTION/1000 E.G., RF OF 1/24000 = 24	_____
3	IN/MI INCHES PER MILE	_____
4	CON INT CONTOUR INTERVAL	_____
5	MAP DIST MAP DISTANCE	_____
6	# INTVLS NUMBER OF CONTOUR INTERVALS	_____

OUTPUT (RUN)

1	SLP % SLOPE STEEPNESS	%	_____
2	SLP DEG SLOPE STEEPNESS	DEGREES	_____
3	EL DIFF ELEVATION CHANGE	FEET	_____
4	HORIZ DIST HORIZONTAL DISTANCE	FEET	_____

1 INPUT ONLY FOR SCALE OPTION = 1

2 INPUT ONLY FOR SCALE OPTION = 2

DIRECT - SCORCH - WIND - SLOPE - RH - WORKSHEET

SHEET _____ OF _____

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

DIRECT MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, RUN, QUIT, SIZE, SCORCH, MAP, TWO)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____

1 MODEL # FUEL MODEL NUMBER (1-99) _____

2 1H 1- H FUEL MOISTURE [1-60%] _____

3 10H 10- H FUEL MOISTURE [1-60%] _____

4 100H 100- H FUEL MOISTURE [1-60%] _____

5 HERB 1 LIVE HERB MOISTURE [30-300%] _____

6 WOOD 1 LIVE WOODY MOISTURE [30-300%] _____

7 MFWS MIDFLAME WINDSPEED [0-99 MI/H] _____

8 SLP SLOPE [0-100% / 0-45 DEGREES] _____

9 WDIR 2 DIRECTION OF WIND VECTOR, DEG. CLOCKWISE FROM UPHILL [0-360 DEGREES] _____

PREDICT AT MAX (Y/N) _____

10 SDIR DIRECTION OF SPREAD CALC., DEG. CLOCKWISE FROM UPHILL OR FROM WIND VECTOR IF SLOPE IS ZERO. [0-360 DEGREES] _____

OUTPUT (RUN)

0 NO MORE TABLES

1 ROS RATE OF SPREAD CH/H _____

2 H/A HEAT PER UNIT AREA BTU/FT² _____

3 FLI FIRELINE INTENSITY BTU/FT/S _____

4 FL FLAME LENGTH FT _____

5 RI REACTION INTENSITY BTU/FT/MIN _____

6 EWS EFFECTIVE WINDSPEED IN DIRECTION SDIR MI/H _____

7 MAXD 3 DIRECTION OF MAXIMUM SPREAD, DEG. CLOCKWISE FROM UPHILL _____

¹ INPUT ONLY IF CORRESPONDING FUEL LOAD IS NOT ZERO.

² INPUT ONLY IF MIDFLAME WINDSPEED (MFWS) AND SLOPE (SLP) ARE NOT ZERO.

³ OUTPUT ONLY IF CALCULATIONS ARE IN DIRECTION OF MAXIMUM SPREAD.

SCORCH MODULE

(KEYWORDS: (INPUT, LIST, RUN, QUIT))

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____

1 TEMP AMBIENT AIR TEMPERATURE [33-120 °F] _____

2 FL 1 FLAME LENGTH [1-20 FT] _____

3 MFWS 1 MIDFLAME WINDSPEED [0-10 MI/H] _____

OUTPUT (RUN)

1 SCHT SCORCH HEIGHT FEET _____

¹ INPUT ONLY IF SCORCH IS USED AS AN INDEPENDENT MODULE.

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. _____ ROW VALUE _____ TABLE VALUES _____

1. _____
2. _____
3. _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL. ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. _____ ROW VALUE _____ TABLE VALUES _____

1. _____
2. _____
3. _____

WIND ADJUSTMENT MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0 PROJECTION POINT
1 20' W 20-FT WINDSPEED [0 - 99 M/H] _____
2 EXPOSURE EXPOSURE TO WIND (1 - 5) _____
1 - EXPOSED
2 - PARTIALLY SHELTERED
3 - FULLY SHELTERED, OPEN STAND
4 - FULLY SHELTERED, CLOSED STAND
5 - ENTER WIND ADJUSTMENT FACTOR
3 WAF 1 WIND ADJUSTMENT FACTOR (0 - 1) _____
4 MODEL # 2 FUEL MODEL NUMBER (1 - 99) _____
OUTPUT (RUN)
1 MFWS MIDFLAME WINDSPEED M/H _____

1 INPUT ONLY FOR EXPOSURE = 5.
2 INPUT ONLY FOR EXPOSURE = 1.

SLOPE MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

FROM POINT TO POINT LIST NUMBER _____

INPUT (INPUT, LIST)

0 PROJECTION POINT
1 SCL OPT SCALE OPTION (1 OR 2) _____
1 = REPRESENTATIVE FRACTION
2 RF/1000 1 REPRESENTATIVE FRACTION/1000 (1 - 500) _____
E.G., RF OF 1/24000 = 24
3 IN/M 2 INCHES PER MILE (0.0625 - 8 IN) _____
4 CON INT CONTOUR INTERVAL (10 - 500 FT) _____
5 MAP DIST MAP DISTANCE (1 - 10 IN) _____
6 # INTVLS NUMBER OF CONTOUR INTERVALS (1 - 100) _____

OUTPUT (RUN)

1 SLP % SLOPE STEEPNESS DEGREES
2 SLP DEG SLOPE STEEPNESS FEET
3 EL DIFF ELEVATION CHANGE FEET
4 HORIZ HORIZONTAL DISTANCE FEET
DIST

1 INPUT ONLY FOR SCALE OPTION = 1
2 INPUT ONLY FOR SCALE OPTION = 2

RH MODULE

(KEYWORDS: INPUT, LIST, QUIT)

INPUT (INPUT, LIST)

0 PROJECTION POINT
1 DRYB DRY BULB TEMPERATURE [33 - 120 ° F] _____
2 WETB WET BULB TEMPERATURE [0 - 120 ° F] _____
3 EL ELEVATION [0 - 12000 FT] _____

OUTPUT (RUN)

1 %RH RELATIVE HUMIDITY % _____
2 DEWP DEW POINT ° F _____

ERROR CODES:

-888 = WET BULB TEMPERATURE GREATER THAN DRY BULB TEMPERATURE.
-999 = DEW POINT TOO COLD FOR VALID CALCULATIONS.

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. TABLE ITEM ROW ITEM COL ITEM

PROJECTION POINT COLUMN VALUES: TABLE VALUES

ROW NO. ROW VALUE TABLE VALUES

1. _____
2. _____
3. _____

TABLE NO. TABLE ITEM ROW ITEM COL ITEM

PROJECTION POINT COLUMN VALUES: TABLE VALUES

ROW NO. ROW VALUE TABLE VALUES

1. _____
2. _____
3. _____

SPOT - MAP - IGNITE WORKSHEET

NAME OF FIRE _____ SHEET _____ OF _____
 DATE _____ FIRE PREDICTION SPEC. _____
 TIME _____
 PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

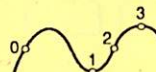
SPOT MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, CONTAIN, RUN, MAP, QUIT)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT
 1 BRAND SRC FIREBRAND SOURCE (1-3)
 1 - TORCHING TREES 3 - WIND DRIVEN
 2 - BURNING PILES SURFACE FIRE
 2 MCHT MEAN COVER HEIGHT [0-300 FT]
 3 20'W 20-FT WINDSPEED [0-99 MVH]
 4 RVEL RIDGE - TO - VALLEY ELEVATION DIFFERENCE [0-4000 FT]
 5 RVHD RIDGE - TO - VALLEY HORIZONTAL DISTANCE [0-4 MI]
 6 SRC LOC SPOTTING SOURCE LOCATION (0-3)



0 - MIDSLOPE, WINDWARD SIDE
 1 - VALLEY BOTTOM
 2 - MIDSLOPE, LEEWARD SIDE
 3 - RIDGETOP

7 TREE SP ¹ TREE SPECIES (1-6)
 1 - ENGELMANN SPRUCE 3 - HEMLOCK 5 - WHITE PINE
 2 - DOUGLAS-FIR 4 - PONDEROSA 6 - BALSAM PINE, GRAND FIR
 SUBALPINE FIR LODGEPOLE PINE
 8 DBH ¹ TORCHING TREE DBH [5-40 INCHES]
 9 TRHT ¹ TORCHING TREE HEIGHT [10-300 FT]
 10 #TR ¹ NUMBER OF TORCHING TREES [1-30]
 11 FLHT ² CONTINUOUS FLAME HEIGHT [1-100 FT]
 12 FL ³ FLAME LENGTH [1-50 FT]
 13 MODEL # ³ FUEL MODEL (1-99)
 14 HERB ⁴ HERBACEOUS MOISTURE [30-300%]

OUTPUT (RUN)

1 SPOT MAXIMUM SPOTTING DISTANCE MI

2 INPUT ONLY FOR

¹ INPUT ONLY FOR FIREBRAND SOURCE = 1 (TORCHING TREE OPTION).

² INPUT ONLY FOR FIREBRAND SOURCE = 2 (BURNING PILE OPTION).

³ INPUT ONLY FOR FIREBRAND SOURCE = 3 (WIND-DRIVEN SURFACE FIRE OPTION).

⁴ INPUT ONLY FOR DYNAMIC FUEL MODELS WITH A HERBACEOUS FUEL LOAD.

MAP MODULE

LIST NUMBER _____

(KEYWORDS: (INPUT, LIST, RUN, QUIT))

INPUT (INPUT, LIST)

0 ---- PROJECTION POINTS
 1 SCL OPT SCALE OPTION (1 OR 2)
 1 - REPRESENTATIVE FRACTION
 2 - INCHES PER MILE
 2 RF/1000 ¹ REPRESENTATION FRACTION/1000 (1-500)
 E.G., RF OF 1/24000=24
 3 IN/MI ² INCHES PER MILE (.0625-8)
 4 UNITS OPT UNITS OPTION 2
 6 SPOT SPOT DISTANCE [.1-10 MI]

OUTPUT (RUN)

1 MSPT FORWARD SPOT DISTANCE INCHES
 ON MAP
 (UNITS OPT = 2)

¹ INPUT ONLY FOR SCALE OPTION = 1

² INPUT ONLY FOR SCALE OPTION = 2

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. TABLE ITEM ROW ITEM COL ITEM

PROJECTION POINT COLUMN VALUES:

ROW NO. ROW VALUE TABLE VALUES

1.
2.
3.

TABLE NO. TABLE ITEM ROW ITEM COL ITEM

PROJECTION POINT COLUMN VALUES:

ROW NO. ROW VALUE TABLE VALUES

1.
2.
3.

IGNITE MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0 ----- PROJECTION POINT _____
 1 TEMP AMBIENT AIR TEMPERATURE [33 - 120 °F] _____
 2 1H 1 - H FUEL MOISTURE [1 - 60%] _____
 3 SHAD SHADE [0 - 100%] _____

OUTPUT (RUN)

1 P (I) PROBABILITY OF IGNITION % _____

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO.	ROW VALUE	TABLE VALUES
1.	_____	_____
2.	_____	_____
3.	_____	_____

FINE DEAD FUEL MOISTURE CALCULATION

A. PROJECTION POINT _____
 B. DAY OR NIGHT (D/N) _____

DAY TIME CALCULATIONS

C. DRY BULB TEMPERATURE, °F _____
 D. RELATIVE HUMIDITY, % _____
 E. REFERENCE FUEL MOISTURE, %
 (FROM TABLE A)
 F. MONTH _____
 G. UNSHADED OR SHADED (U/S) _____
 H. TIME _____
 I. ELEVATION CHANGE _____

B = 1000' - 2000' BELOW SITE
 L = ± 1000' OF SITE LOCATION
 A = 1000' - 2000' ABOVE SITE

J. ASPECT _____
 K. SLOPE _____
 L. FUEL MOISTURE CORRECTION,
 % (FROM TABLE B, C, OR D)
 M. FINE DEAD FUEL MOISTURE,
 % (LINE E + LINE L)

NIGHT TIME CALCULATIONS

N. DRY BULB TEMPERATURE, °F _____
 O. RELATIVE HUMIDITY, % _____
 P. REFERENCE FUEL MOISTURE,
 % (FROM TABLE E)

USE TABLE F ONLY IF A STRONG INVERSION
 EXISTS AND A CORRECTION MUST BE MADE
 FOR ELEVATION OR ASPECT CHANGE.

Q. ASPECT OF PROJECTION POINT _____
 R. ASPECT OF SITE LOCATION _____
 S. TIME _____
 T. ELEVATION CHANGE _____
 B = 1000' - 2000' BELOW SITE
 L = ± 1000' OF SITE LOCATION
 A = 1000' - 2000' ABOVE SITE

U. CORRECTION FOR PROJECTION POINT
 LOCATION (FROM TABLE F)
 V. CORRECTION FOR SITE LOCATION (L)
 (FROM TABLE F)
 W. FUEL MOISTURE CORRECTION, %
 (LINE U - LINE V)
 X. FINE DEAD FUEL MOISTURE, %
 (LINE P + LINE W)

SIZE - MAP - CONTAIN

NAME OF FIRE _____ SHEET _____ OF _____
 DATE _____ FIRE PREDICTION SPEC. _____
 PROJ. PERIOD DATE _____ TIME _____
 PROJ. TIME FROM _____ TO _____

SIZE MODULE

LIST NUMBER _____

(KEYWORDS: INPUT, LIST, ¹CONTAIN, RUN, MAP, QUIT)

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____
 1 ROS ² RATE OF SPREAD [1-500 CH/H] _____
 2 EWS ² EFFECTIVE WINDSPEED [0-99 MI/H] _____
 3 ET ³ ELAPSED TIME [1-8H] _____

OUTPUT (RUN)

0 NO MORE TABLES
 1 AREA AREA ACRES _____
 2 PER PERIMETER CH _____
 3 LW LENGTH-TO WIDTH RATIO _____
 4 FSD FORWARD SPREAD DISTANCE CH _____
 5 BSD BACKING SPREAD DISTANCE CH _____
 6 MXW MAXIMUM FIRE WIDTH CH _____

¹ SIZE CAN LINK TO CONTAIN ONLY IF LINKED TO DIRECT.
² INPUT ONLY WHEN SIZE IS USED AS AN INDEPENDENT MODULE.
³ ONLY INPUT WHEN LINKED FROM DIRECT.

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____
 ROW NO. ROW VALUE TABLE VALUES
 1. _____
 2. _____
 3. _____

MAP MODULE

LIST NUMBER _____

(KEYWORDS: (INPUT, LIST, RUN, QUIT))

INPUT (INPUT, LIST)

0 ---- PROJECTION POINT _____
 1 SCL OPT SCALE OPTION (1 OR 2) _____
 1- REPRESENTATIVE FRACTION
 2- INCHES PER MILE
 2 RF/1000 ¹ REPRESENTATION FRACTION/1000 (1-500) _____
 E.G., RF OF 1/24000=24
 3 IN/MI ² INCHES PER MILE (.0625-8) _____
 4 UNITS OPT UNITS OPTION (1-3) _____
 1- SPREAD DISTANCE
 2- SPOTTING DISTANCE
 3- RATE OF SPREAD
 5 DIST ³ SPREAD DISTANCE [0-1000 CH] _____
 6 SPOT ⁴ SPOTTING DISTANCE [.1-10 MI] _____
 7 ROS ⁵ RATE OF SPREAD [1-500 CH/H] _____
 8 TIME ⁵ ELAPSED TIME [1-8H] _____
 5 FSD ⁶ FORWARD SPREAD DISTANCE CH _____
 6 BSD ⁶ BACKING SPREAD DISTANCE CH _____
 7 MXW ⁶ MAXIMUM FIRE WIDTH CH _____

OUTPUT (RUN)

1 MFSD FORWARD SPREAD DISTANCE ON MAP (UNITS OPT = 1 OR 3) INCHES _____
 1 MSPT SPOTTING DISTANCE ON MAP (UNITS OPT = 2) INCHES _____
 2 MBSD BACKING SPREAD DISTANCE ON MAP (SIZE LINKED ONLY) INCHES _____
 3 MMXW MAXIMUM FIRE WIDTH ON MAP (SIZE LINKED ONLY) INCHES _____
 1 INPUT ONLY FOR SCALE OPTION = 1.
 2 INPUT ONLY FOR SCALE OPTION = 2.
 3 INPUT ONLY FOR UNITS OPTION = 1.
 4 INPUT ONLY FOR UNITS OPTION = 2.
 5 INPUT ONLY FOR UNITS OPTION = 3.
 6 PASSED FROM SIZE FOR LINKED RUN ONLY. NO INPUT IS NEEDED.

CONTAIN MODULE

LIST NUMBER _____

INPUT (INPUT, LIST) (KEYWORDS: INPUT, LIST, RUN, QUIT)

0	----	PROJECTION POINT	_____
1	RUN OPT	RUN OPTION (1 OR 2)	_____
		1 = CALCULATE TOTAL LINE BUILDING RATE	
		2 = CALCULATE BURNED AREA	
2	ATTACK OPT	ATTACK OPTION (1 OR 2)	_____
		1 = HEAD	
		2 = REAR	
3	ROS	¹ RATE OF SPREAD [1-500 CH/H]	_____
4	AREA	¹ INITIAL FIRE AREA [1-100 ACRES]	_____
5	L/W	¹ LENGTH -TO-WIDTH RATIO [1-5]	_____
6	BAT	² BURNED AREA TARGET [1-2000 ACRES]	_____
7	TLBR	³ TOTAL LINE BUILDING [1-800 CH/H]	_____

OUTPUT (RUN)

1	PER	TOTAL LENGTH OF LINE CHAINS	_____
2	TIME	CONTAINMENT TIME HOURS	_____
3	FFS	⁴ FINAL FIRE SIZE ACRES	_____
3	TLBR	⁵ TOTAL LINE BUILDING RATE CH/H	_____
4	MAXA	⁵ MAXIMUM AREA CALCULABLE ACRES	_____
5	MINA	⁵ MINIMUM AREA CALCULABLE ACRES	_____

ERROR CODES:

- 1 = BURNED AREA TARGET TOO LARGE, CANNOT CALCULATE SLOW ENOUGH LINE BUILDING RATE.
- 2 = LINE BUILDING RATE TOO SLOW TO CATCH FIRE.
- 3 = L/W RATIO TOO LARGE.
- 4 = BURNED AREA TARGET TOO CLOSE TO INITIAL FIRE SIZE.
- 5 = LINE BUILDING RATE TOO FAST.

¹ INPUT ONLY WHEN CONTAIN IS USED AS AN INDEPENDENT MODULE.

² INPUT ONLY FOR RUN OPTION = 1 (CALCULATE TOTAL LINE BUILDING RATE).

³ INPUT ONLY FOR RUN OPTION = 2 (CALCULATE BURNED AREA TARGET).

⁴ OUTPUT ONLY FOR RUN OPTION = 2.

⁵ OUTPUT ONLY FOR RUN OPTION = 1.

OUTPUT TABLES

LIST NUMBER _____

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1.
2.
3.

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1.
2.
3.

TABLE NO. _____ TABLE ITEM _____ ROW ITEM _____ COL ITEM _____

PROJECTION POINT _____ COLUMN VALUES: _____

ROW NO. ROW VALUE TABLE VALUES

1.
2.
3.

MOISTURE

NAME OF FIRE _____ FIRE PREDICTION SPEC. _____

DATE _____ TIME _____

PROJ. PERIOD DATE _____ PROJ. TIME FROM _____ TO _____

MOISTURE MODULE

(KEYWORDS: INPUT, LIST, RUN, QUIT)

INPUT (INPUT, LIST)

0	PROJECTION POINT	_____
1	RUN OPT	RUN OPTION (1 OR 2) _____ 1 - BURN TIME CALCULATIONS 2 - HOURLY CALCULATIONS
TIME AND LOCATION		
2	BURN MONTH	MONTH OF BURN (1-12) _____
3	BURN DAY	DAY OF BURN (1-31) _____
4	LATITUDE	LATITUDE OF FIRE (-90 TO 90 DEGREES) _____
5	BURN TIME	TIME OF BURN (0-2359 H) _____
FUEL MODEL		
6	MODEL #	FUEL MODEL NUMBER (1-99) _____
SLOPE, ELEVATION, ASPECT		
11	SLP	SLOPE STEEPNESS (0-100% / 0-45 DEGREES) _____
12	ELFL	ELEVATION OF FIRE LOCATION (0-12000 FT) _____
	RH OBS AT FIRE	(Y/N) _____
13	ELOB	ELEVATION OF T&RH OBSERVATIONS (0-12000 FT) _____
14	ASPECT	ASPECT OF FIRE LOCATION (0-360 DEGREES) _____
		0 - NORTH 180 - SOUTH 90 - EAST 270 - WEST
TIMBER OVERSTORY DESCRIPTION		
15	CCLO	CROWN CLOSURE (0-100%) _____
16	FOLIAGE	FOLIAGE PRESENCE (0 OR 1) _____ 0 - ABSENT 1 - PRESENT
17	SHADE TOL	SHADE TOLERANCE (0 OR 1) _____ 0 - INTOLERANT 1 - TOLERANT
18	DOM TYPE	DOMINANT TREE TYPE (1 OR 2) _____ 1 - CONIFEROUS 2 - DECIDUOUS
19	AVTH	AVERAGE TREE HEIGHT (10-300 FT) _____
20	H/H	CROWN HEIGHT/TREE HEIGHT RATIO (1-1) _____
21	H/D	CROWN HEIGHT/CROWN DIAMETER RATIO (2-5) _____

EARLY AFTERNOON WEATHER

22	14T	BURN DAY 1400 TEMPERATURE	(33-120 °F) _____
23	14RH	BURN DAY 1400 RELATIVE HUMIDITY	(1-100%) _____
24	14W	BURN DAY 1400 20-FT WINDSPEED	(0-99 MPH) _____
25	14CC	BURN DAY CLOUD COVER	(0-100%) _____
26	14HZ	BURN DAY 1400 HAZINESS	(1-4) _____

1 - VERY CLEAR SKY
2 - AVERAGE CLEAR FOREST ATMOSPHERE
3 - MODERATE BLUE HAZE
4 - DENSE HAZE-MODERATE SMOKE

SUNSET WEATHER

27	SST	SUNSET TEMPERATURE	(33-120 °F) _____
28	SSRH	SUNSET RELATIVE HUMIDITY	(1-100%) _____
29	SSW	SUNSET 20-FT WINDSPEED	(0-99 MPH) _____
30	SSCC	SUNSET CLOUD COVER	(0-100%) _____

SUNRISE WEATHER

31	SRT	SUNRISE TEMPERATURE	(33-120 °F) _____
32	SRRH	SUNRISE RELATIVE HUMIDITY	(1-100%) _____
33	SRW	SUNRISE 20-FT WINDSPEED	(0-99 MPH) _____
34	SRCC	SUNRISE CLOUD COVER	(0-100%) _____

BURN TIME WEATHER

35	BTT	BURN TIME TEMPERATURE	(33-120 °F) _____
36	BTRH	BURN TIME RELATIVE HUMIDITY	(1-100%) _____
37	BTW	BURN TIME 20-FT WINDSPEED	(0-99 MPH) _____
38	BTCC	BURN TIME CLOUD COVER	(0-100%) _____
39	BTHZ	BURN TIME HAZINESS	(1-4) _____

1 - VERY CLEAR SKY
2 - AVERAGE CLEAR FOREST ATMOSPHERE
3 - MODERATE BLUE HAZE
4 - DENSE HAZE-MODERATE SMOKE

FUEL LEVEL WIND ADJUSTMENT

40	EXPOSURE	EXPOSURE OF FUELS TO WIND (0-5) _____ 1 - UNSHELTERED 2 - PARTIALLY SHELTERED 3 - FULLY SHELTERED - OPEN STAND 4 - FULLY SHELTERED - CLOSED STAND 5 - DIRECT ENTRY OF WIND ADJUSTMENT FACTOR
41	WAF	WIND ADJUSTMENT FACTOR - EXPOSURE 5 ONLY (0-1) _____

TABLE OF FINE AREAS

Perimeter in Chains	1	2	3	4	5
1	.01	.01	.01	.01	.01
2	.02	.02	.02	.02	.02
3	.03	.03	.03	.03	.03
4	.04	.04	.04	.04	.04
5	.05	.05	.05	.05	.05
6	.06	.06	.06	.06	.06
7	.07	.07	.07	.07	.07
8	.08	.08	.08	.08	.08
9	.09	.09	.09	.09	.09
10	.10	.10	.10	.10	.10
11	.11	.11	.11	.11	.11
12	.12	.12	.12	.12	.12
13	.13	.13	.13	.13	.13
14	.14	.14	.14	.14	.14
15	.15	.15	.15	.15	.15
16	.16	.16	.16	.16	.16
17	.17	.17	.17	.17	.17
18	.18	.18	.18	.18	.18
19	.19	.19	.19	.19	.19
20	.20	.20	.20	.20	.20
21	.21	.21	.21	.21	.21
22	.22	.22	.22	.22	.22
23	.23	.23	.23	.23	.23
24	.24	.24	.24	.24	.24
25	.25	.25	.25	.25	.25
26	.26	.26	.26	.26	.26
27	.27	.27	.27	.27	.27
28	.28	.28	.28	.28	.28
29	.29	.29	.29	.29	.29
30	.30	.30	.30	.30	.30
31	.31	.31	.31	.31	.31
32	.32	.32	.32	.32	.32
33	.33	.33	.33	.33	.33
34	.34	.34	.34	.34	.34
35	.35	.35	.35	.35	.35
36	.36	.36	.36	.36	.36
37	.37	.37	.37	.37	.37
38	.38	.38	.38	.38	.38
39	.39	.39	.39	.39	.39
40	.40	.40	.40	.40	.40
41	.41	.41	.41	.41	.41
42	.42	.42	.42	.42	.42
43	.43	.43	.43	.43	.43
44	.44	.44	.44	.44	.44
45	.45	.45	.45	.45	.45
46	.46	.46	.46	.46	.46
47	.47	.47	.47	.47	.47
48	.48	.48	.48	.48	.48
49	.49	.49	.49	.49	.49
50	.50	.50	.50	.50	.50
51	.51	.51	.51	.51	.51
52	.52	.52	.52	.52	.52
53	.53	.53	.53	.53	.53
54	.54	.54	.54	.54	.54
55	.55	.55	.55	.55	.55
56	.56	.56	.56	.56	.56
57	.57	.57	.57	.57	.57
58	.58	.58	.58	.58	.58
59	.59	.59	.59	.59	.59
60	.60	.60	.60	.60	.60
61	.61	.61	.61	.61	.61
62	.62	.62	.62	.62	.62
63	.63	.63	.63	.63	.63
64	.64	.64	.64	.64	.64
65	.65	.65	.65	.65	.65
66	.66	.66	.66	.66	.66
67	.67	.67	.67	.67	.67
68	.68	.68	.68	.68	.68
69	.69	.69	.69	.69	.69
70	.70	.70	.70	.70	.70
71	.71	.71	.71	.71	.71
72	.72	.72	.72	.72	.72
73	.73	.73	.73	.73	.73
74	.74	.74	.74	.74	.74
75	.75	.75	.75	.75	.75
76	.76	.76	.76	.76	.76
77	.77	.77	.77	.77	.77
78	.78	.78	.78	.78	.78
79	.79	.79	.79	.79	.79
80	.80	.80	.80	.80	.80
81	.81	.81	.81	.81	.81
82	.82	.82	.82	.82	.82
83	.83	.83	.83	.83	.83
84	.84	.84	.84	.84	.84
85	.85	.85	.85	.85	.85
86	.86	.86	.86	.86	.86
87	.87	.87	.87	.87	.87
88	.88	.88	.88	.88	.88
89	.89	.89	.89	.89	.89
90	.90	.90	.90	.90	.90
91	.91	.91	.91	.91	.91
92	.92	.92	.92	.92	.92
93	.93	.93	.93	.93	.93
94	.94	.94	.94	.94	.94
95	.95	.95	.95	.95	.95
96	.96	.96	.96	.96	.96
97	.97	.97	.97	.97	.97
98	.98	.98	.98	.98	.98
99	.99	.99	.99	.99	.99
100	1.00	1.00	1.00	1.00	1.00

This table is to help you estimate the area of a fire. To use it, pace the distance around the fire in chains (1 chain = 66 feet), and determine the general shape of the fire. Then select the one column (1-5) which best fits the fire's shape. Read under the column the acreage listed opposite the number of chains that you paced.

Explanation of columns representing shapes of fires:

1. Fire in the general shape of a Circle.
2. Fire in the shape of either a square or rectangle which is not more than twice as long as it is wide with a moderately irregular perimeter.
3. Fire in the shape of a rectangle, about three times longer than it is wide. This column also gives the area of a triangle with a moderately irregular perimeter.
4. Fire in the shape of a rectangle about four times longer than it is wide and having a fairly irregular perimeter.
5. Fire which is long and narrow with an irregular perimeter.
6. Fire with two or three long fingers or a very irregular perimeter.

Notes: For larger fires it is recommended that ground or aerial surveys be made to compute acreage.

TABLE OF FINE AREAS

Perimeter in Chains	1	2	3	4	5	6
1	.01	.01	.01	.01	.01	.01
2	.02	.02	.02	.02	.02	.02
3	.03	.03	.03	.03	.03	.03
4	.04	.04	.04	.04	.04	.04
5	.05	.05	.05	.05	.05	.05
6	.06	.06	.06	.06	.06	.06
7	.07	.07	.07	.07	.07	.07
8	.08	.08	.08	.08	.08	.08
9	.09	.09	.09	.09	.09	.09
10	.10	.10	.10	.10	.10	.10
11	.11	.11	.11	.11	.11	.11
12	.12	.12	.12	.12	.12	.12
13	.13	.13	.13	.13	.13	.13
14	.14	.14	.14	.14	.14	.14
15	.15	.15	.15	.15	.15	.15
16	.16	.16	.16	.16	.16	.16
17	.17	.17	.17	.17	.17	.17
18	.18	.18	.18	.18	.18	.18
19	.19	.19	.19	.19	.19	.19
20	.20	.20	.20	.20	.20	.20
21	.21	.21	.21	.21	.21	.21
22	.22	.22	.22	.22	.22	.22
23	.23	.23	.23	.23	.23	.23
24	.24	.24	.24	.24	.24	.24
25	.25	.25	.25	.25	.25	.25
26	.26	.26	.26	.26	.26	.26
27	.27	.27	.27	.27	.27	.27
28	.28	.28	.28	.28	.28	.28
29	.29	.29	.29	.29	.29	.29
30	.30	.30	.30	.30	.30	.30
31	.31	.31	.31	.31	.31	.31
32	.32	.32	.32	.32	.32	.32
33	.33	.33	.33	.33	.33	.33
34	.34	.34	.34	.34	.34	.34
35	.35	.35	.35	.35	.35	.35
36	.36	.36	.36	.36	.36	.36
37	.37	.37	.37	.37	.37	.37
38	.38	.38	.38	.38	.38	.38
39	.39	.39	.39	.39	.39	.39
40	.40	.40	.40	.40	.40	.40
41	.41	.41	.41	.41	.41	.41
42	.42	.42	.42	.42	.42	.42
43	.43	.43	.43	.43	.43	.43
44	.44	.44	.44	.44	.44	.44
45	.45	.45	.45	.45	.45	.45
46	.46	.46	.46	.46	.46	.46
47	.47	.47	.47	.47	.47	.47
48	.48	.48	.48	.48	.48	.48
49	.49	.49	.49	.49	.49	.49
50	.50	.50	.50	.50	.50	.50
51	.51	.51	.51	.51	.51	.51
52	.52	.52	.52	.52	.52	.52
53	.53	.53	.53	.53	.53	.53
54	.54	.54	.54	.54	.54	.54
55	.55	.55	.55	.55	.55	.55
56	.56	.56	.56	.56	.56	.56
57	.57	.57	.57	.57	.57	.57
58	.58	.58	.58	.58	.58	.58
59	.59	.59	.59	.59	.59	.59
60	.60	.60	.60	.60	.60	.60
61	.61	.61	.61	.61	.61	.61
62	.62	.62	.62	.62	.62	.62
63	.63	.63	.63	.63	.63	.63
64	.64	.64	.64	.64	.64	.64
65	.65	.65	.65	.65	.65	.65
66	.66	.66	.66	.66	.66	.66
67	.67	.67	.67	.67	.67	.67
68	.68	.68	.68	.68	.68	.68
69	.69	.69	.69	.69	.69	.69
70	.70	.70	.70	.70	.70	.70
71	.71	.71	.71	.71	.71	.71
72	.72	.72	.72	.72	.72	.72
73	.73	.73	.73	.73	.73	.73
74	.74	.74	.74	.74	.74	.74
75	.75	.75	.75	.75	.75	.75
76	.76	.76	.76	.76	.76	.76
77	.77	.77	.77	.77	.77	.77
78	.78	.78	.78	.78	.78	.78
79	.79	.79	.79	.79	.79	.79
80	.80	.80	.80	.80	.80	.80
81	.81	.81	.81	.81	.81	.81
82	.82	.82	.82	.82	.82	.82
83	.83	.83	.83	.83	.83	.83
84	.84	.84	.84	.84	.84	.84
85	.85	.85	.85	.85	.85	.85
86	.86	.86	.86	.86	.86	.86
87	.87	.87	.87	.87	.87	.87
88	.88	.88	.88	.88	.88	.88
89	.89	.89	.89	.89	.89	.89
90	.90	.90	.90	.90	.90	.90
91	.91	.91	.91	.91	.91	.91
92	.92	.92	.92	.92	.92	.92
93	.93	.93	.93	.93	.93	.93
94	.94	.94	.94	.94	.94	.94
95	.95	.95	.95	.95	.95	.95
96	.96	.96	.96	.96	.96	.96
97	.97	.97	.97	.97	.97	.97
98	.98	.98	.98	.98	.98	.98
99	.99	.99	.99	.99	.99	.99
100	1.00	1.00	1.00	1.00	1.00	1.00

This table is to help you estimate the area of a fire. To use it, pace the distance around the fire in chains (1 chain = 66 feet), and determine the general shape of the fire. Then select the one column (1-6) which best fits the fire's shape. Read under the column the acreage listed opposite the number of chains that you paced.

Explanation of columns representing shapes of fires:

1. Fire in the general shape of a Circle.
2. Fire in the shape of either a square or rectangle which is not more than twice as long as it is wide with a moderately irregular perimeter.
3. Fire in the shape of a rectangle, about three times longer than it is wide. This column also gives the area of a triangle with a moderately irregular perimeter.
4. Fire in the shape of a rectangle about four times longer than it is wide and having a fairly irregular perimeter.
5. Fire which is long and narrow with an irregular perimeter.
6. Fire with two or three long fingers or a very irregular perimeter.

Notes: For larger fires it is recommended that ground or aerial surveys be made to compute acreage.