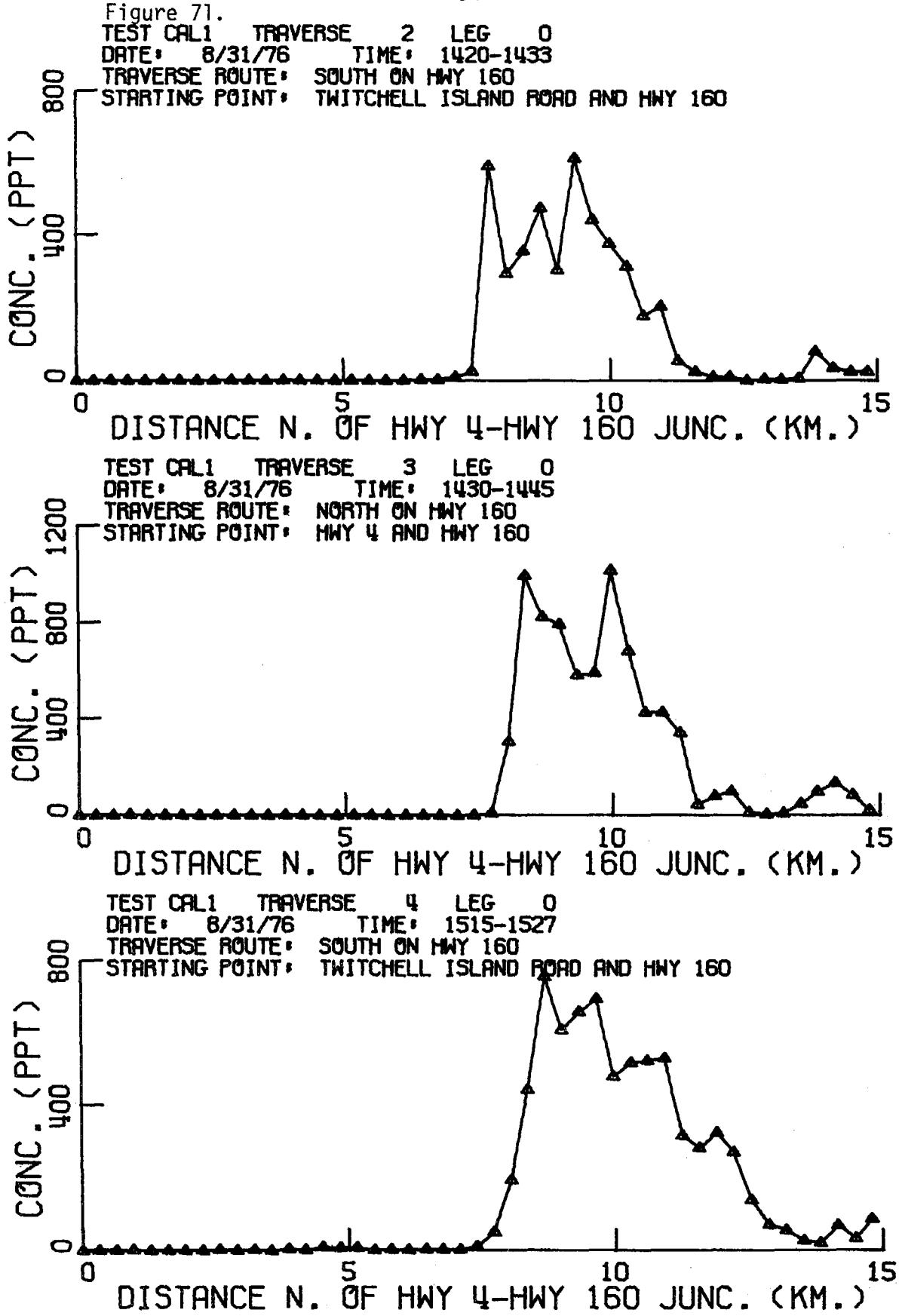
3.3 Automobile Traverse Tracer Data

The automobile traverse tracer data are plotted in the following figures as concentration versus distance along the traverse. The data from traverses along Highway 160 are plotted as a function of the distance north of the intersection of Highway 4 and Highway 160. Traverses with maximum concentrations less than 10 ppt are not plotted.

Figure 71.


TEST CAL1 TRAVERSE 2 LEG 0
DATE: 8/31/76 TIME: 1420-1433
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: TWITCHELL ISLAND ROAD AND HWY 160
CONC. (PPT)
0
400
800
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL1 TRAVERSE 3 LEG 0
DATE: 8/31/76 TIME: 1430-1445
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: HWY 4 AND HWY 160
CONC. (PPT)
0
400
800
1200
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL1 TRAVERSE 4 LEG 0
DATE: 8/31/76 TIME: 1515-1527
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: TWITCHELL ISLAND ROAD AND HWY 160
CONC. (PPT)
0
400
800
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

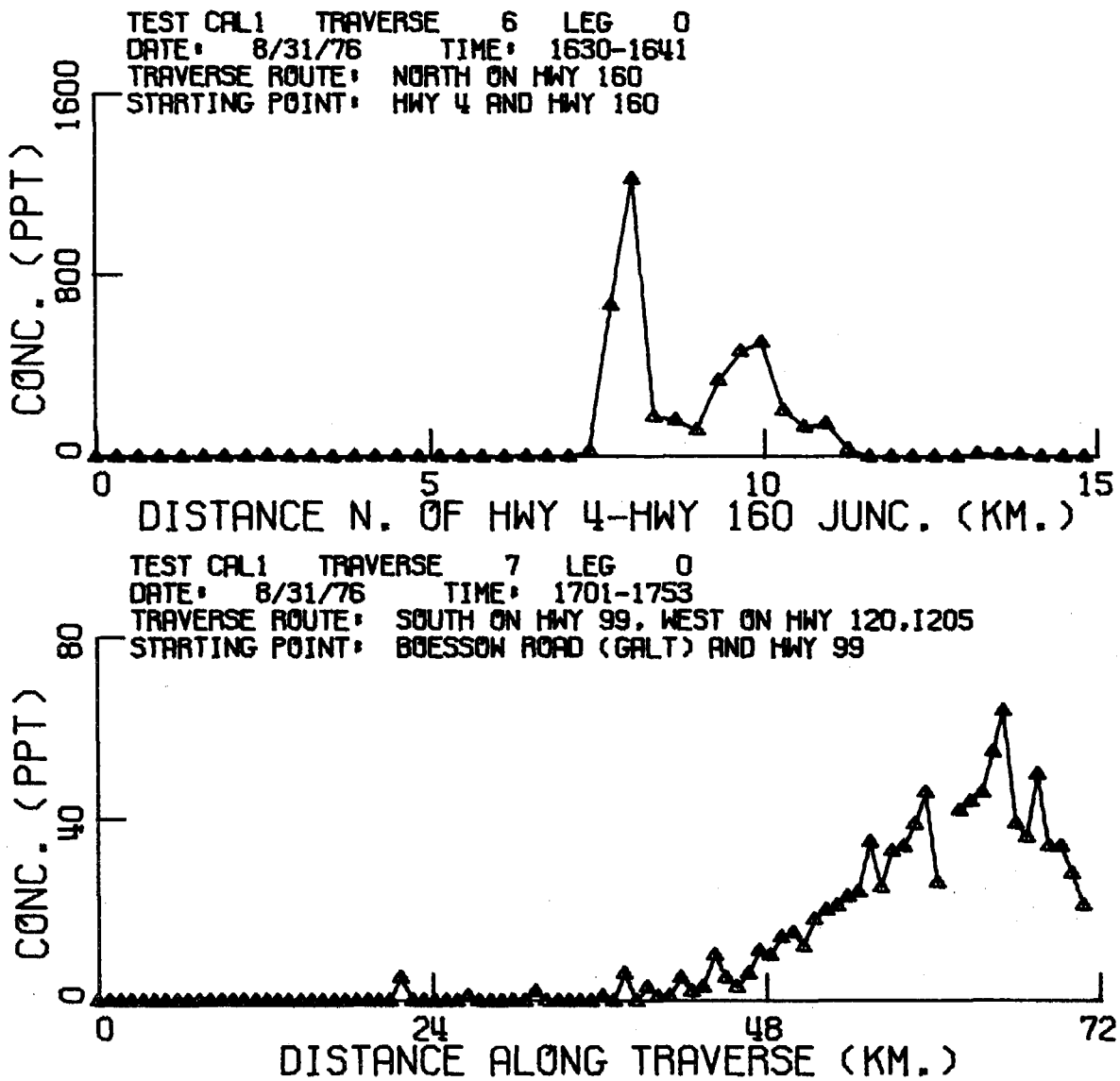

TEST CAL1 TRAVERSE 6 LEG 0
DATE: 8/31/76 TIME: 1630-1641
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: HWY 4 AND HWY 160
CONC. (PPT)
0
800
1600
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL1 TRAVERSE 7 LEG 0
DATE: 8/31/76 TIME: 1701-1753
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120,I205
STARTING POINT: BOESSOW ROAD (GALT) AND HWY 99
CONC. (PPT)
0
40
80
0
24
48
72
DISTANCE ALONG TRAVERSE (KM.)

Figure 72.

Figure 73.

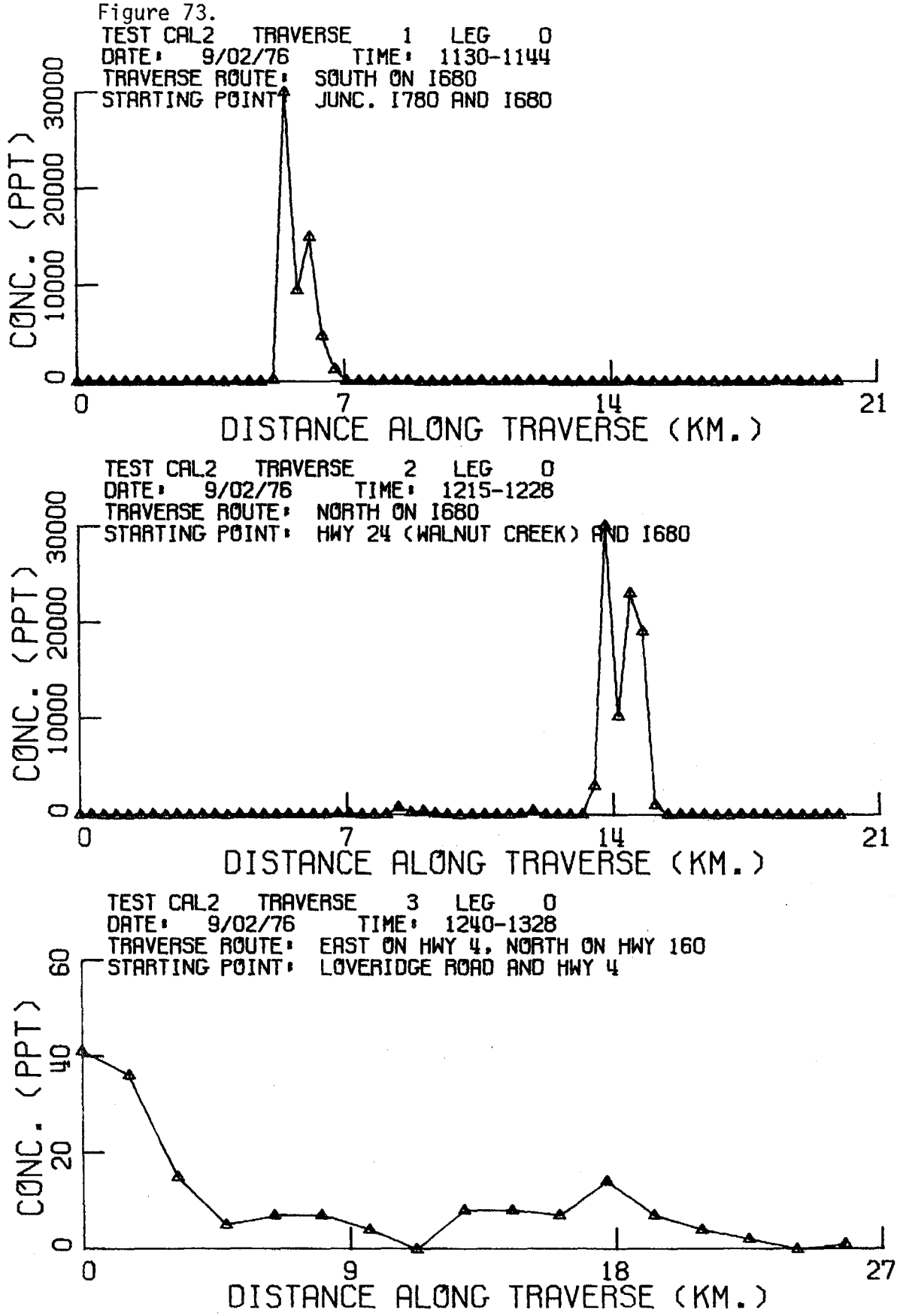

TEST CAL2 TRAVERSE 1 LEG 0
DATE: 9/02/76 TIME: 1130-1144
TRAVERSE ROUTE: SOUTH ON I680
STARTING POINT: JUNC. I780 AND I680
CONC. (PPT)
0
10000
20000
30000
0
7
14
21
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 2 LEG 0
DATE: 9/02/76 TIME: 1215-1228
TRAVERSE ROUTE: NORTH ON I680
STARTING POINT: HWY 24 (WALNUT CREEK) AND I680
CONC. (PPT)
0
10000
20000
30000
0
7
14
21
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 3 LEG 0
DATE: 9/02/76 TIME: 1240-1328
TRAVERSE ROUTE: EAST ON HWY 4, NORTH ON HWY 160
STARTING POINT: LOVERIDGE ROAD AND HWY 4
CONC. (PPT)
0
20
40
60
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)

Figure 74.

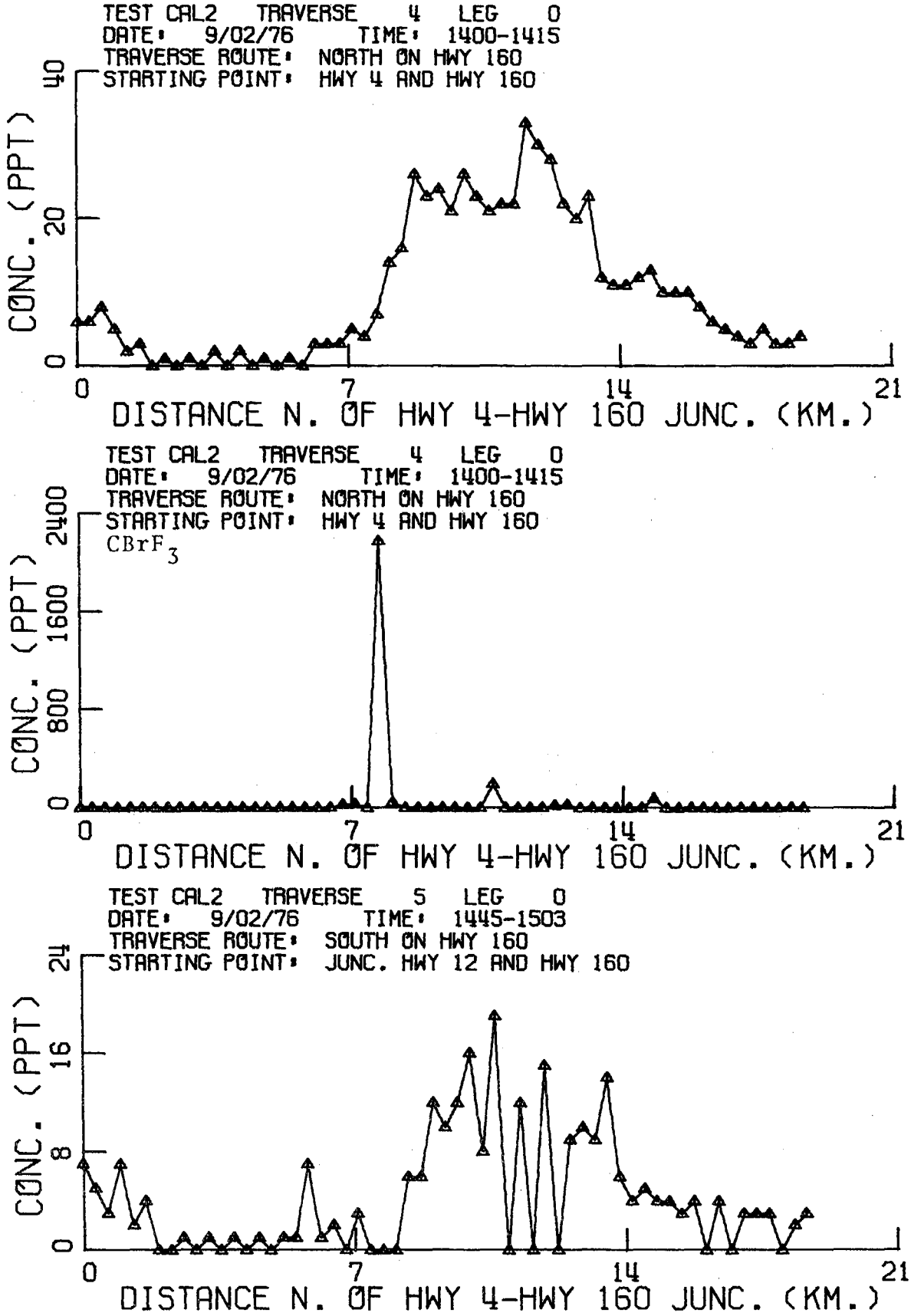

TEST CAL2 TRAVERSE 4 LEG 0
DATE: 9/02/76 TIME: 1400-1415
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: HWY 4 AND HWY 160
CONC. (PPT)
0
20
40
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL2 TRAVERSE 4 LEG 0
DATE: 9/02/76 TIME: 1400-1415
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: HWY 4 AND HWY 160
CBrF3
CONC. (PPT)
0
800
1600
2400
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL2 TRAVERSE 5 LEG 0
DATE: 9/02/76 TIME: 1445-1503
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CONC. (PPT)
0
8
16
24
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 75.

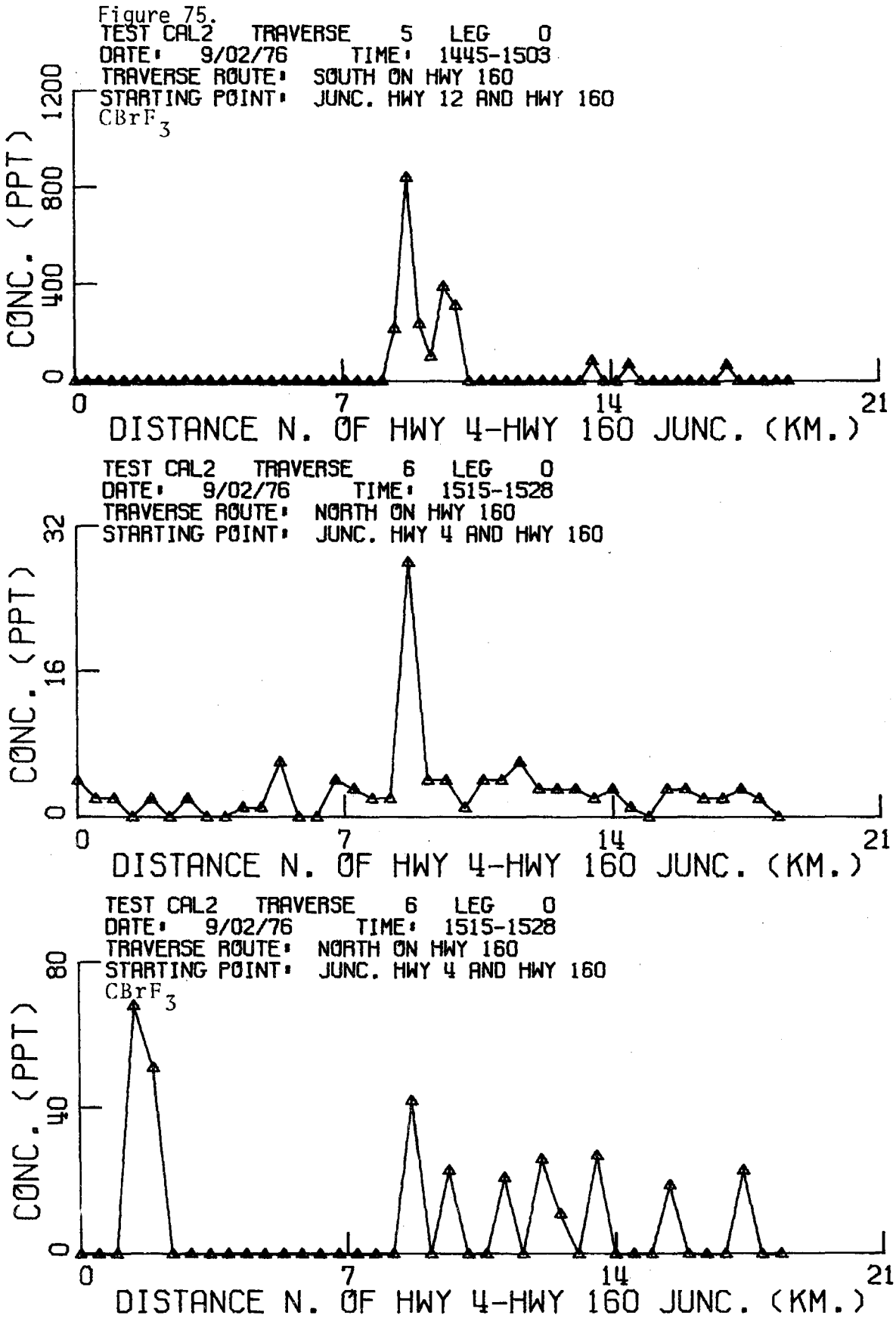

TEST CAL2 TRAVERSE 5 LEG 0
DATE: 9/02/76 TIME: 1445-1503
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CBrF3
CONC. (PPT)
0
400
800
1200
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL2 TRAVERSE 6 LEG 0
DATE: 9/02/76 TIME: 1515-1528
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: JUNC. HWY 4 AND HWY 160
CONC. (PPT)
0
16
32
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL2 TRAVERSE 6 LEG 0
DATE: 9/02/76 TIME: 1515-1528
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: JUNC. HWY 4 AND HWY 160
CBrF3
CONC. (PPT)
0
40
80
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 76.

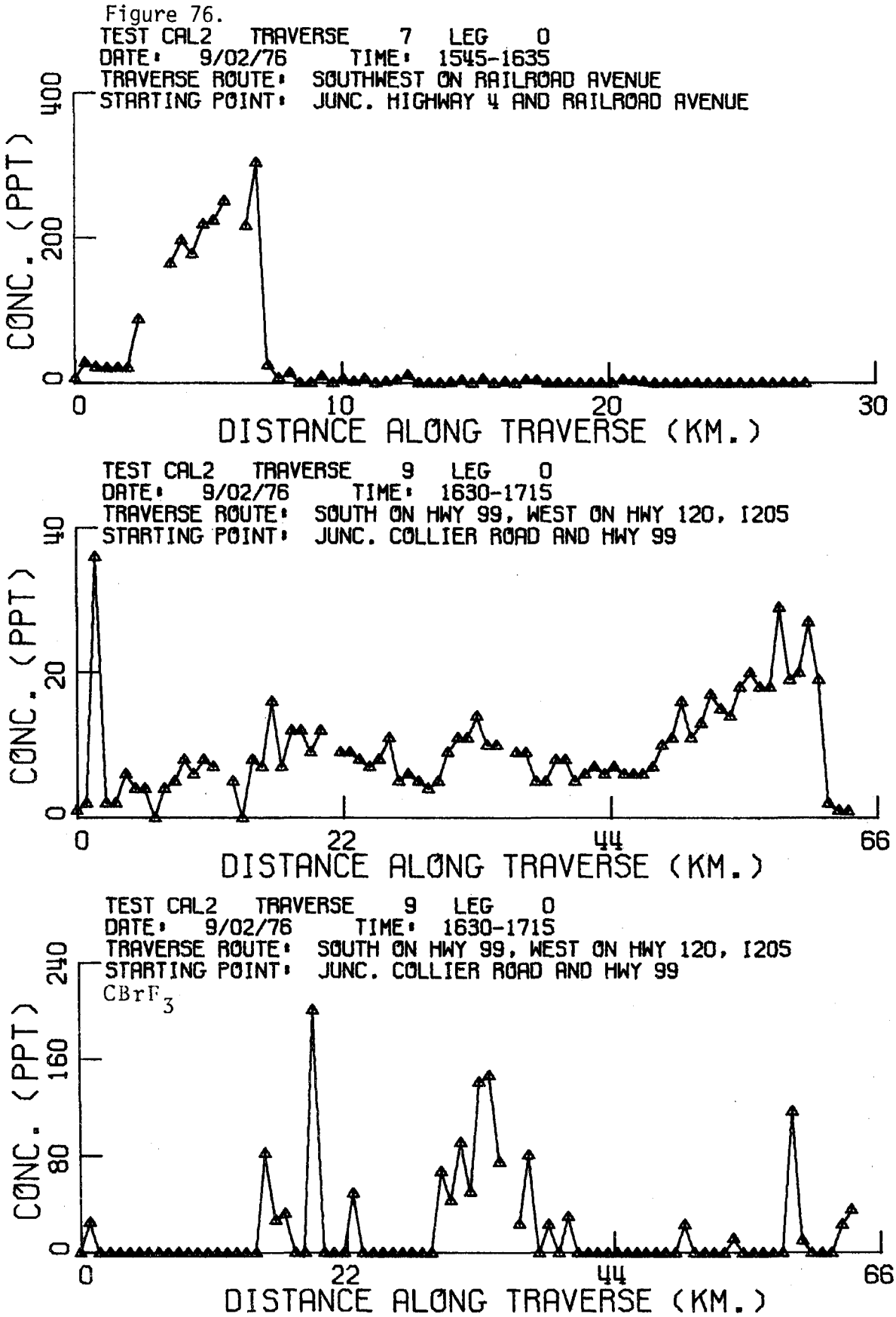

TEST CAL2 TRAVERSE 7 LEG 0
DATE: 9/02/76 TIME: 1545-1635
TRAVERSE ROUTE: SOUTHWEST ON RAILROAD AVENUE
STARTING POINT: JUNC. HIGHWAY 4 AND RAILROAD AVENUE
CONC. (PPT)
0
200
400
0
10
20
30
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 9 LEG 0
DATE: 9/02/76 TIME: 1630-1715
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. COLLIER ROAD AND HWY 99
CONC. (PPT)
0
20
40
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 9 LEG 0
DATE: 9/02/76 TIME: 1630-1715
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. COLLIER ROAD AND HWY 99
CBrF3
CONC. (PPT)
0
80
160
240
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 77.

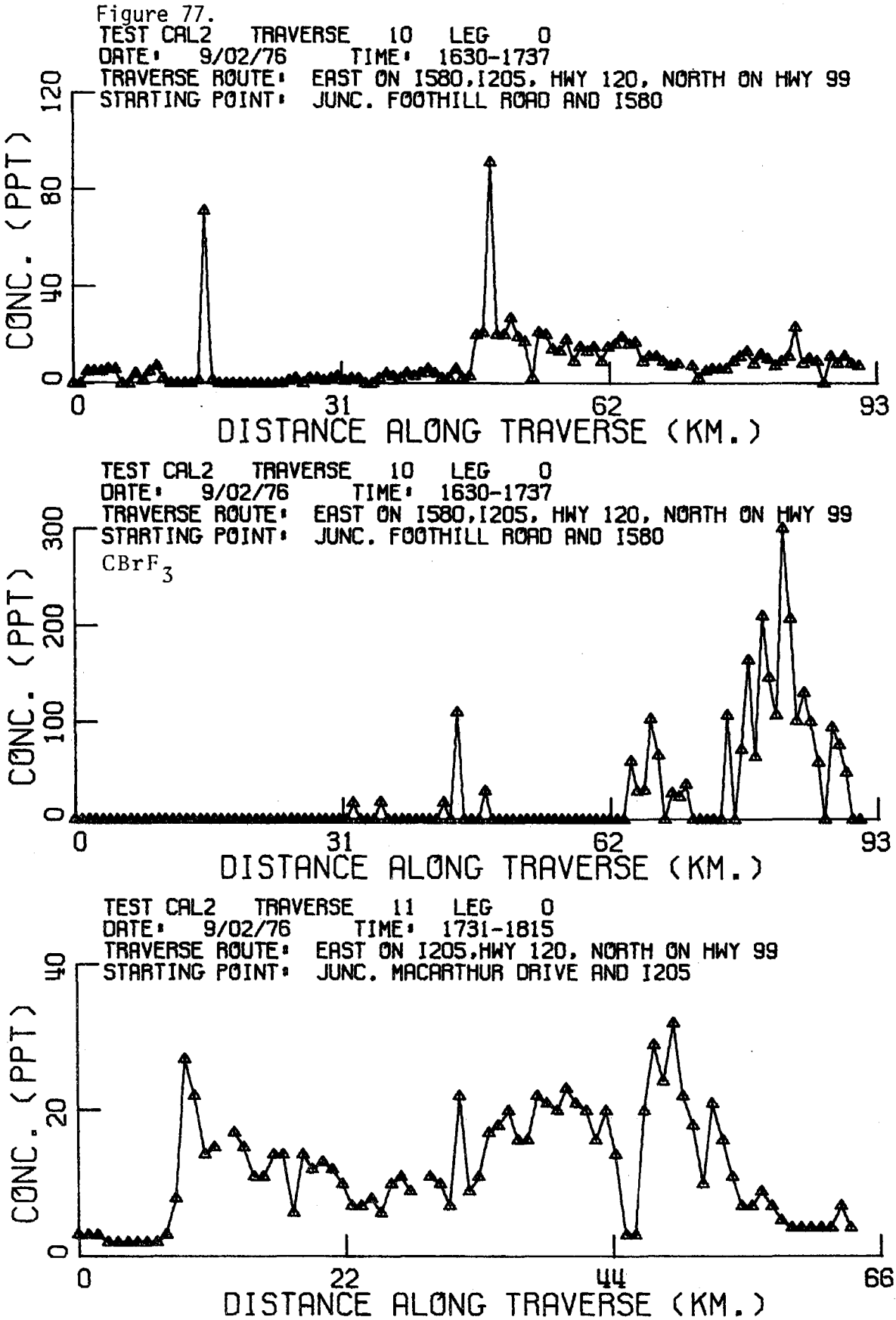

TEST CAL2 TRAVERSE 10 LEG 0
DATE: 9/02/76 TIME: 1630-1737
TRAVERSE ROUTE: EAST ON I580,I205, HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. FOOTHILL ROAD AND I580
CONC. (PPT)
0
40
80
120
0
31
62
93
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 10 LEG 0
DATE: 9/02/76 TIME: 1630-1737
TRAVERSE ROUTE: EAST ON I580,I205, HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. FOOTHILL ROAD AND I580
CBrF3
CONC. (PPT)
0
100
200
300
0
31
62
93
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 11 LEG 0
DATE: 9/02/76 TIME: 1731-1815
TRAVERSE ROUTE: EAST ON I205,HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. MACARTHUR DRIVE AND I205
CONC. (PPT)
0
20
40
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 78.

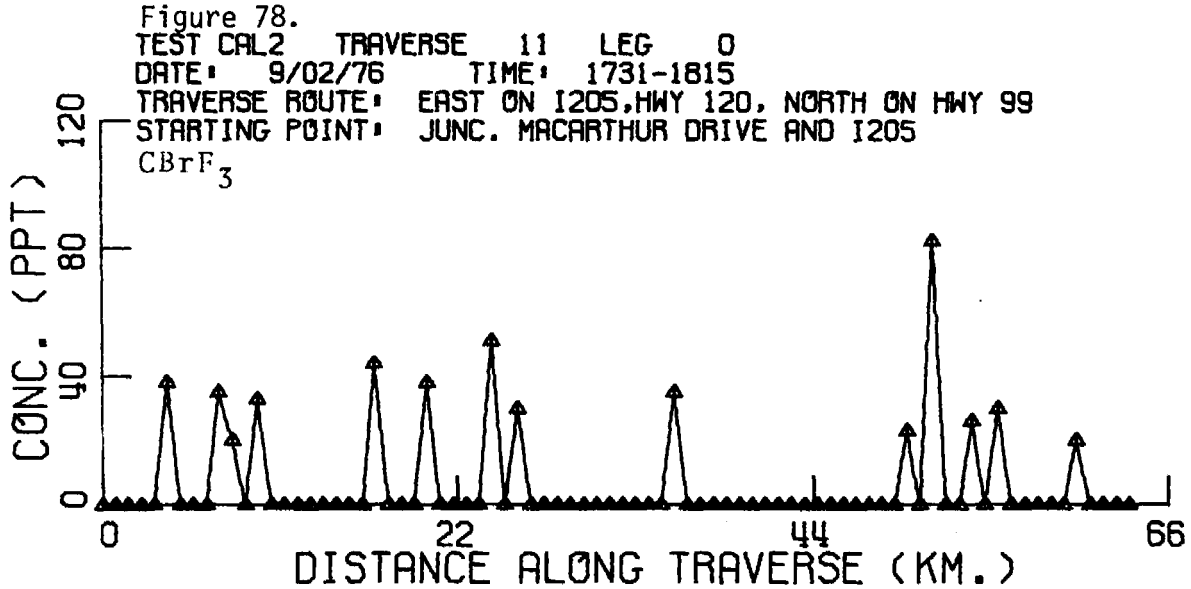

TEST CAL2 TRAVERSE 11 LEG 0
DATE: 9/02/76 TIME: 1731-1815
TRAVERSE ROUTE: EAST ON I205,HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. MACARTHUR DRIVE AND I205
CBrF3
CONC. (PPT)
0
40
80
120
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 79.

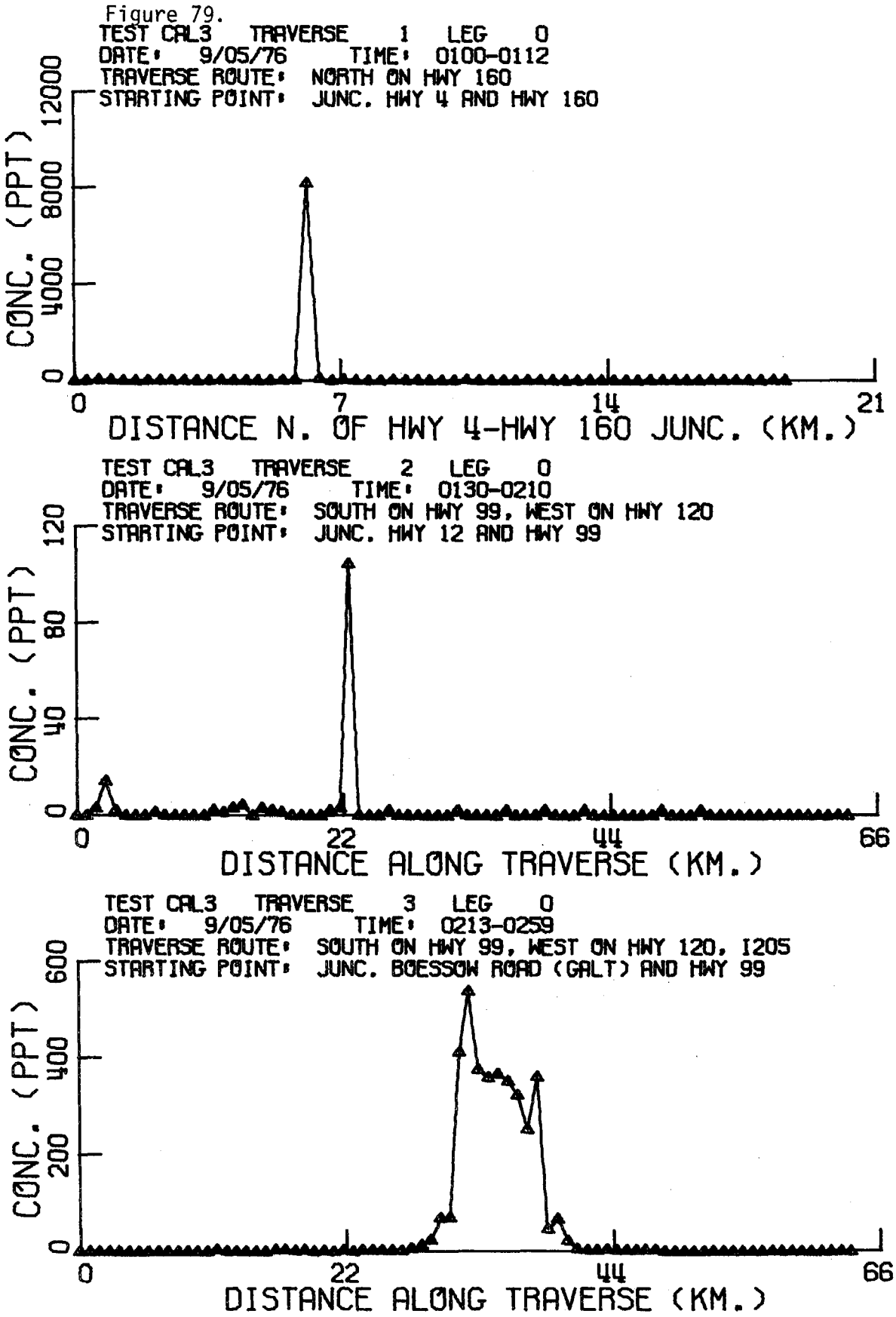

TEST CAL3 TRAVERSE 1 LEG 0
DATE: 9/05/76 TIME: 0100-0112
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: JUNC. HWY 4 AND HWY 160
CONC. (PPT)
0
4000
8000
12000
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 2 LEG 0
DATE: 9/05/76 TIME: 0130-0210
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120
STARTING POINT: JUNC. HWY 12 AND HWY 99
CONC. (PPT)
0
40
80
120
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL3 TRAVERSE 3 LEG 0
DATE: 9/05/76 TIME: 0213-0259
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. BOESSOW ROAD (GALT) AND HWY 99
CONC. (PPT)
0
200
400
600
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 80.

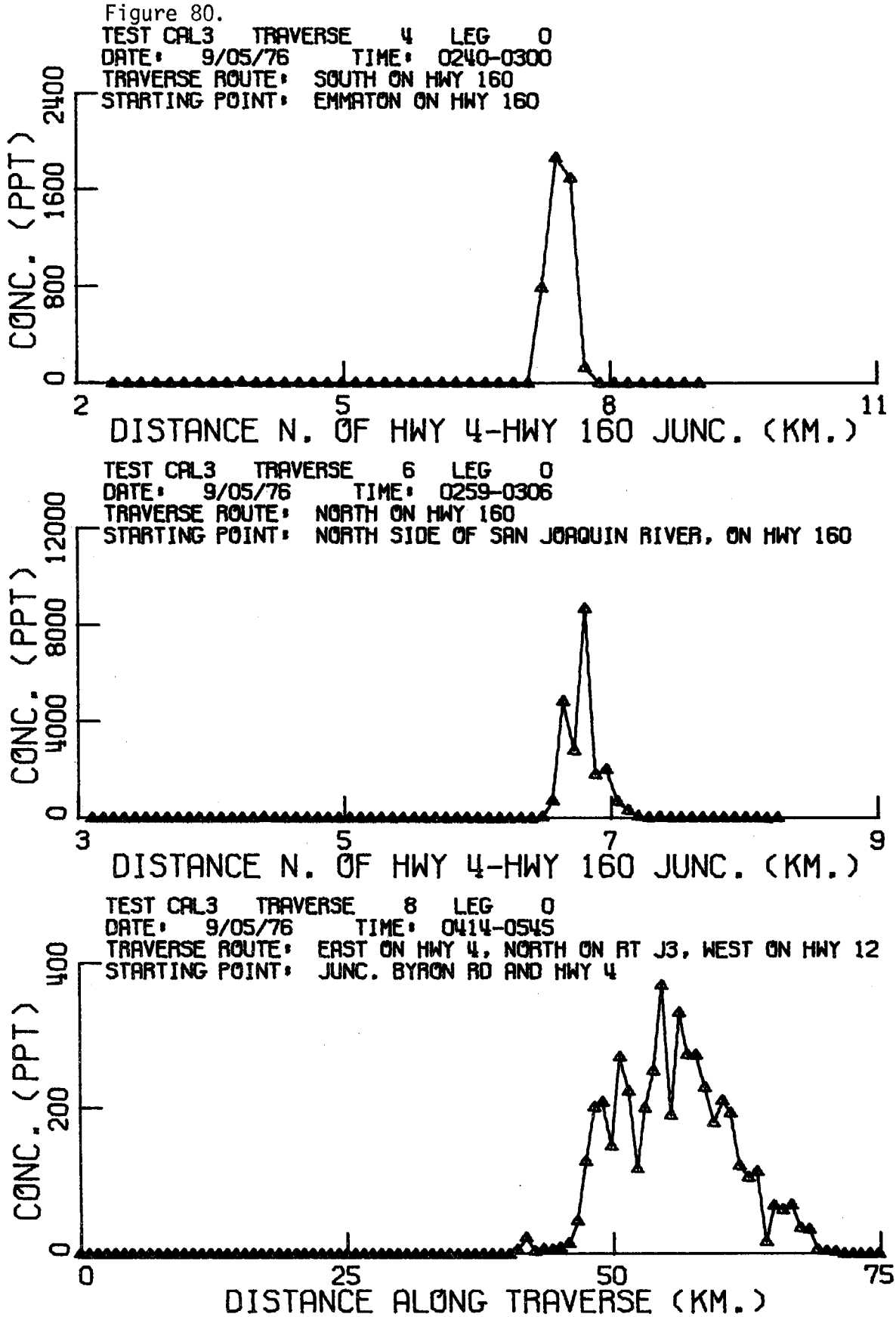

TEST CAL3 TRAVERSE 4 LEG 0
DATE: 9/05/76 TIME: 0240-0300
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: EMMATON ON HWY 160
CONC. (PPT)
0
800
1600
2400
2
5
8
11
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 6 LEG 0
DATE: 9/05/76 TIME: 0259-0306
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE OF SAN JOAQUIN RIVER, ON HWY 160
CONC. (PPT)
0
4000
8000
12000
3
5
7
9
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 8 LEG 0
DATE: 9/05/76 TIME: 0414-0545
TRAVERSE ROUTE: EAST ON HWY 4, NORTH ON RT J3, WEST ON HWY 12
STARTING POINT: JUNC. BYRON RD AND HWY 4
CONC. (PPT)
0
200
400
0
25
50
75
DISTANCE ALONG TRAVERSE (KM.)

Figure 81.

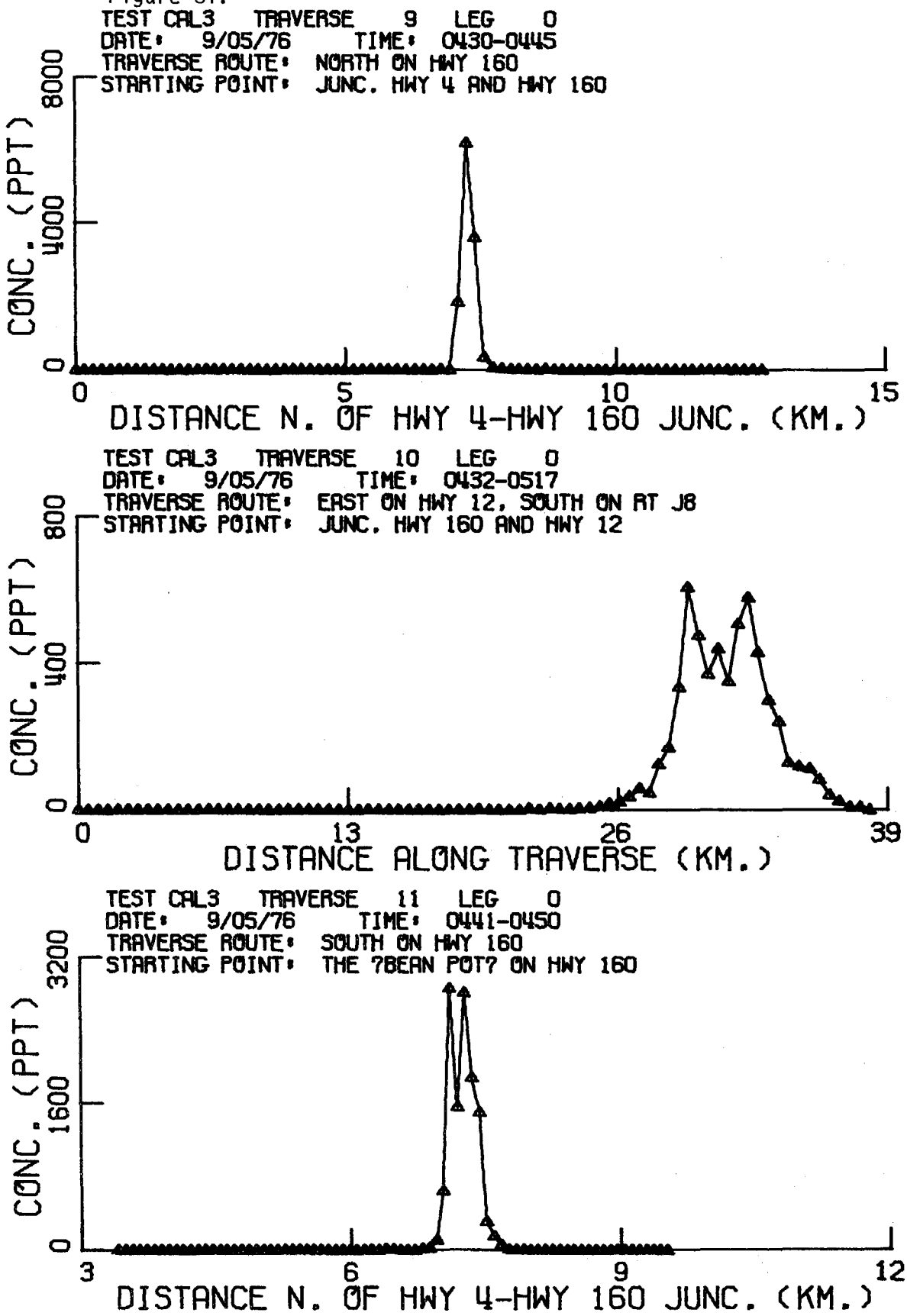

TEST CAL3 TRAVERSE 9 LEG 0
DATE: 9/05/76 TIME: 0430-0445
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: JUNC. HWY 4 AND HWY 160
CONC. (PPT)
0
4000
8000
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 10 LEG 0
DATE: 9/05/76 TIME: 0432-0517
TRAVERSE ROUTE: EAST ON HWY 12, SOUTH ON RT J8
STARTING POINT: JUNC. HWY 160 AND HWY 12
CONC. (PPT)
0
400
800
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL3 TRAVERSE 11 LEG 0
DATE: 9/05/76 TIME: 0441-0450
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: THE ?BEAN POT? ON HWY 160
CONC. (PPT)
0
1600
3200
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 82.

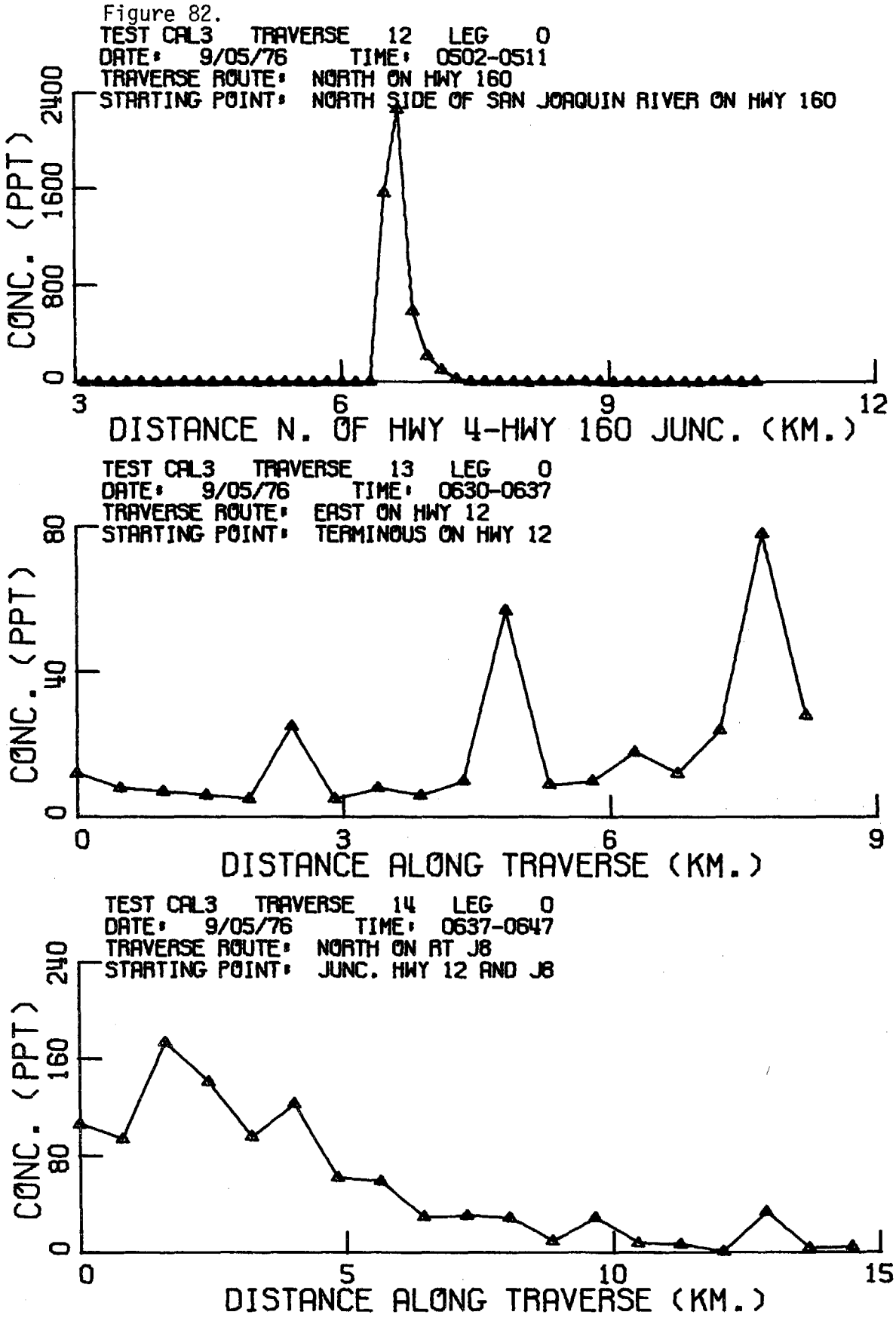

TEST CAL3 TRAVERSE 12 LEG 0
DATE: 9/05/76 TIME: 0502-0511
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE OF SAN JOAQUIN RIVER ON HWY 160
CONC. (PPT)
0
800
1600
2400
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 13 LEG 0
DATE: 9/05/76 TIME: 0630-0637
TRAVERSE ROUTE: EAST ON HWY 12
STARTING POINT: TERMINOUS ON HWY 12
CONC. (PPT)
0
40
80
0
3
6
9
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL3 TRAVERSE 14 LEG 0
DATE: 9/05/76 TIME: 0637-0647
TRAVERSE ROUTE: NORTH ON RT J8
STARTING POINT: JUNC. HWY 12 AND J8
CONC. (PPT)
0
80
160
240
0
5
10
15
DISTANCE ALONG TRAVERSE (KM.)

Figure 83.

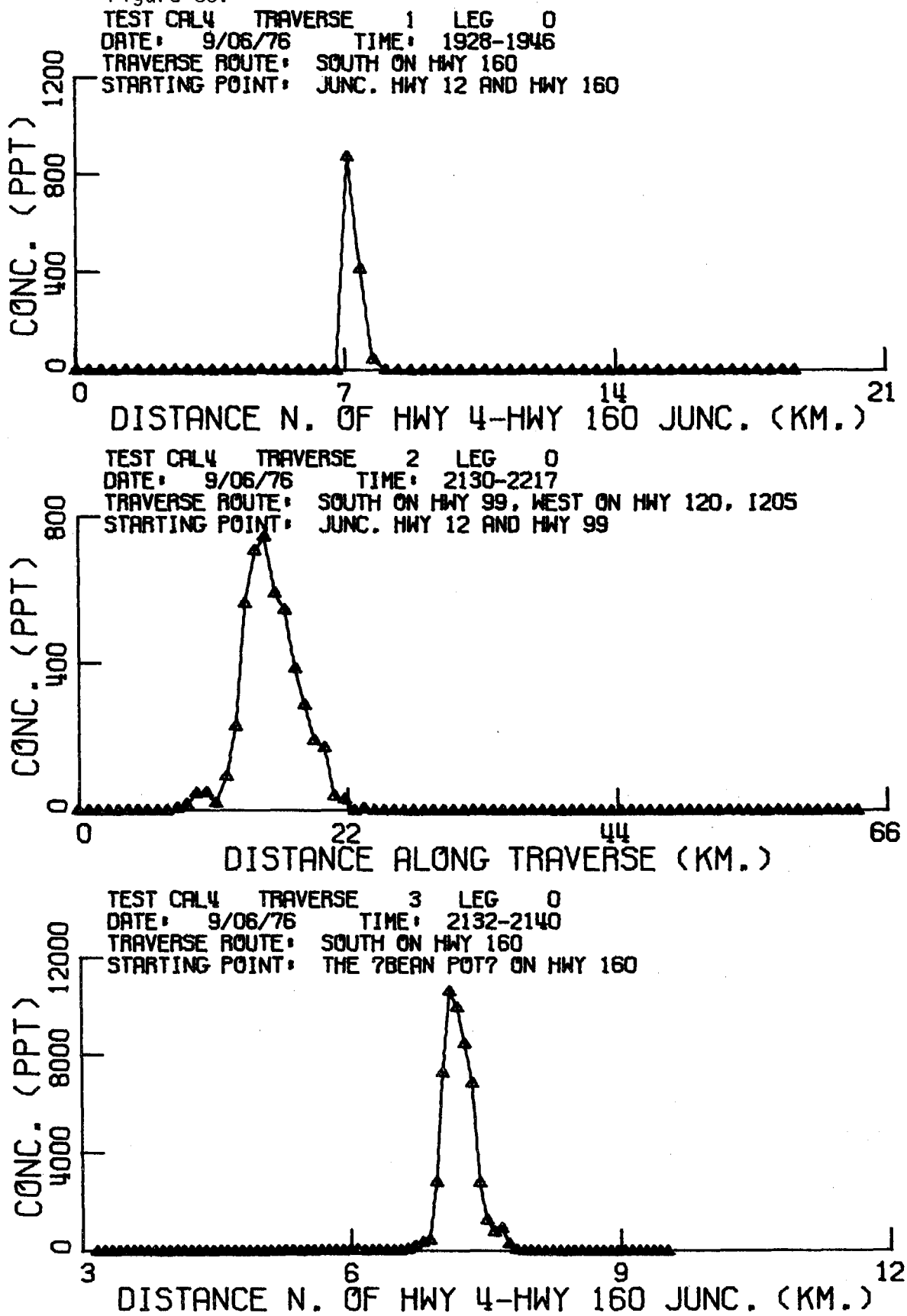

TEST CAL4 TRAVERSE 1 LEG 0
DATE: 9/06/76 TIME: 1928-1946
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CONC. (PPT)
0
400
800
1200
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL4 TRAVERSE 2 LEG 0
DATE: 9/06/76 TIME: 2130-2217
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 AND HWY 99
CONC. (PPT)
0
400
800
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL4 TRAVERSE 3 LEG 0
DATE: 9/06/76 TIME: 2132-2140
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: THE ?BEAN POT? ON HWY 160
CONC. (PPT)
0
4000
8000
12000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 84.

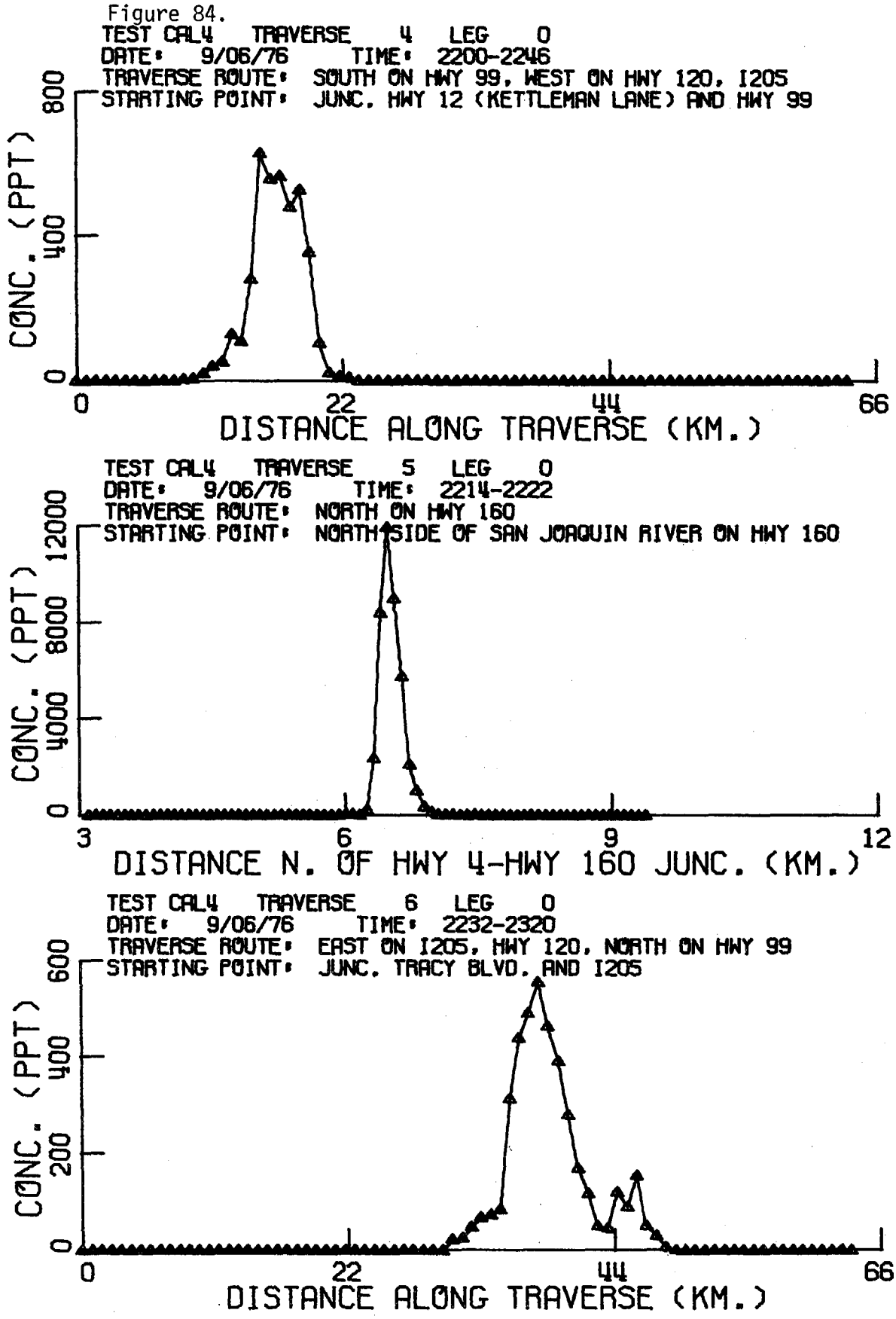

TEST CAL4 TRAVERSE 4 LEG 0
DATE: 9/06/76 TIME: 2200-2246
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 (KETTLEMAN LANE) AND HWY 99
CONC. (PPT)
0
400
800
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL4 TRAVERSE 5 LEG 0
DATE: 9/06/76 TIME: 2214-2222
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE OF SAN JOAQUIN RIVER ON HWY 160
CONC. (PPT)
0
4000
8000
12000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL4 TRAVERSE 6 LEG 0
DATE: 9/06/76 TIME: 2232-2320
TRAVERSE ROUTE: EAST ON I205, HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. TRACY BLVD. AND I205
CONC. (PPT)
0
200
400
600
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 85.

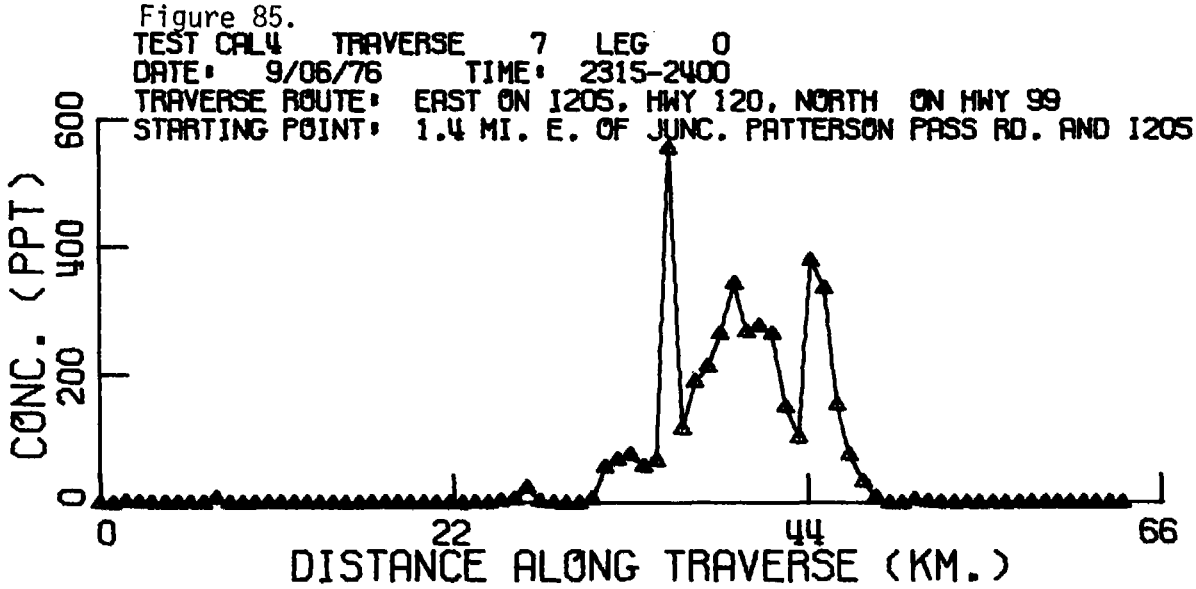

TEST CAL4 TRAVERSE 7 LEG 0
DATE: 9/06/76 TIME: 2315-2400
TRAVERSE ROUTE: EAST ON I205, HWY 120, NORTH ON HWY 99
STARTING POINT: 1.4 MI. E. OF JUNC. PATTERSON PASS RD. AND I205
CONC. (PPT)
0
200
400
600
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 86.

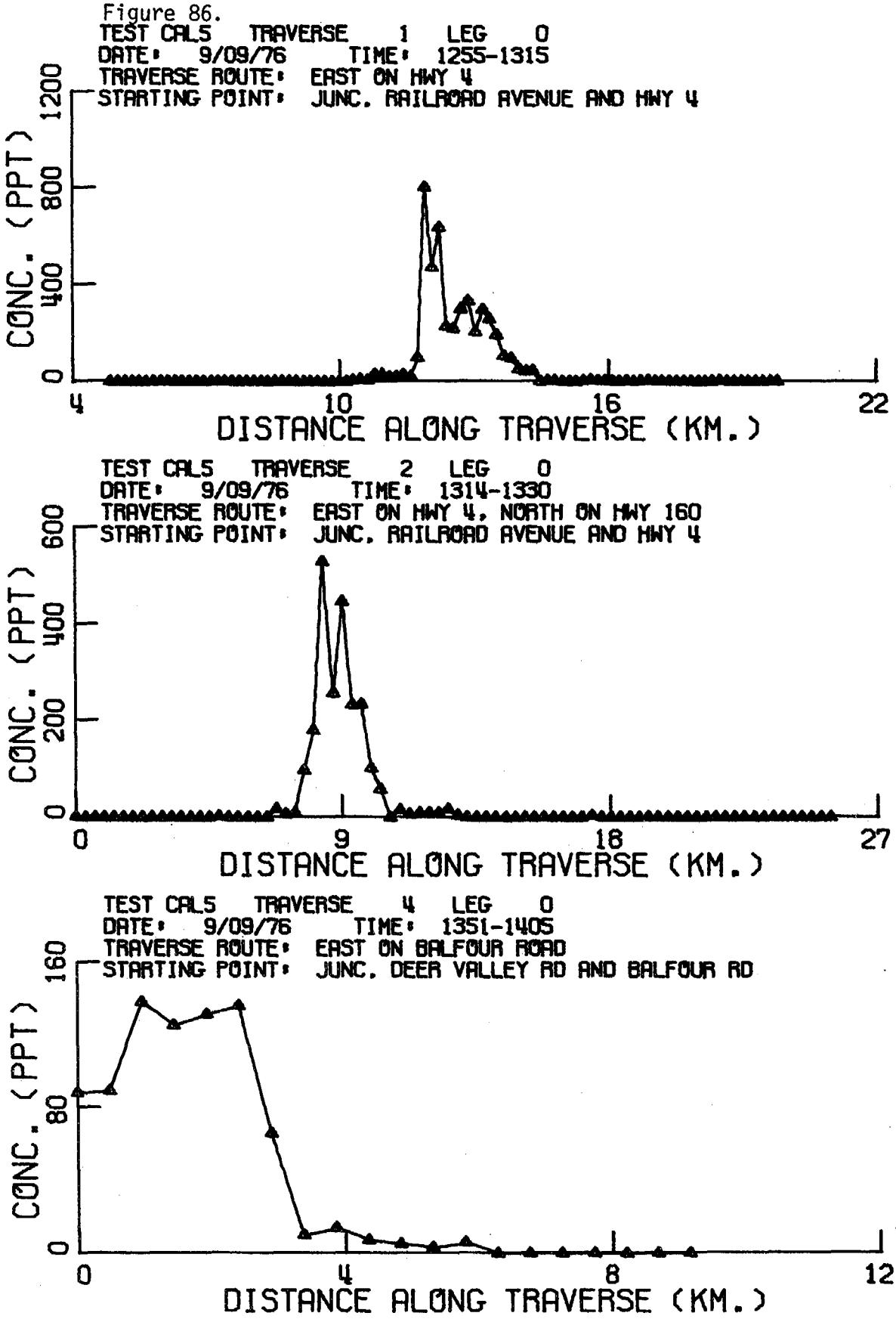

TEST CAL5 TRAVERSE 1 LEG 0
DATE: 9/09/76 TIME: 1255-1315
TRAVERSE ROUTE: EAST ON HWY 4
STARTING POINT: JUNC. RAILROAD AVENUE AND HWY 4
CONC. (PPT)
0
400
800
1200
4
10
16
22
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 2 LEG 0
DATE: 9/09/76 TIME: 1314-1330
TRAVERSE ROUTE: EAST ON HWY 4, NORTH ON HWY 160
STARTING POINT: JUNC. RAILROAD AVENUE AND HWY 4
CONC. (PPT)
0
200
400
600
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 4 LEG 0
DATE: 9/09/76 TIME: 1351-1405
TRAVERSE ROUTE: EAST ON BALFOUR ROAD
STARTING POINT: JUNC. DEER VALLEY RD AND BALFOUR RD
CONC. (PPT)
0
80
160
0
4
8
12
DISTANCE ALONG TRAVERSE (KM.)

Figure 87.

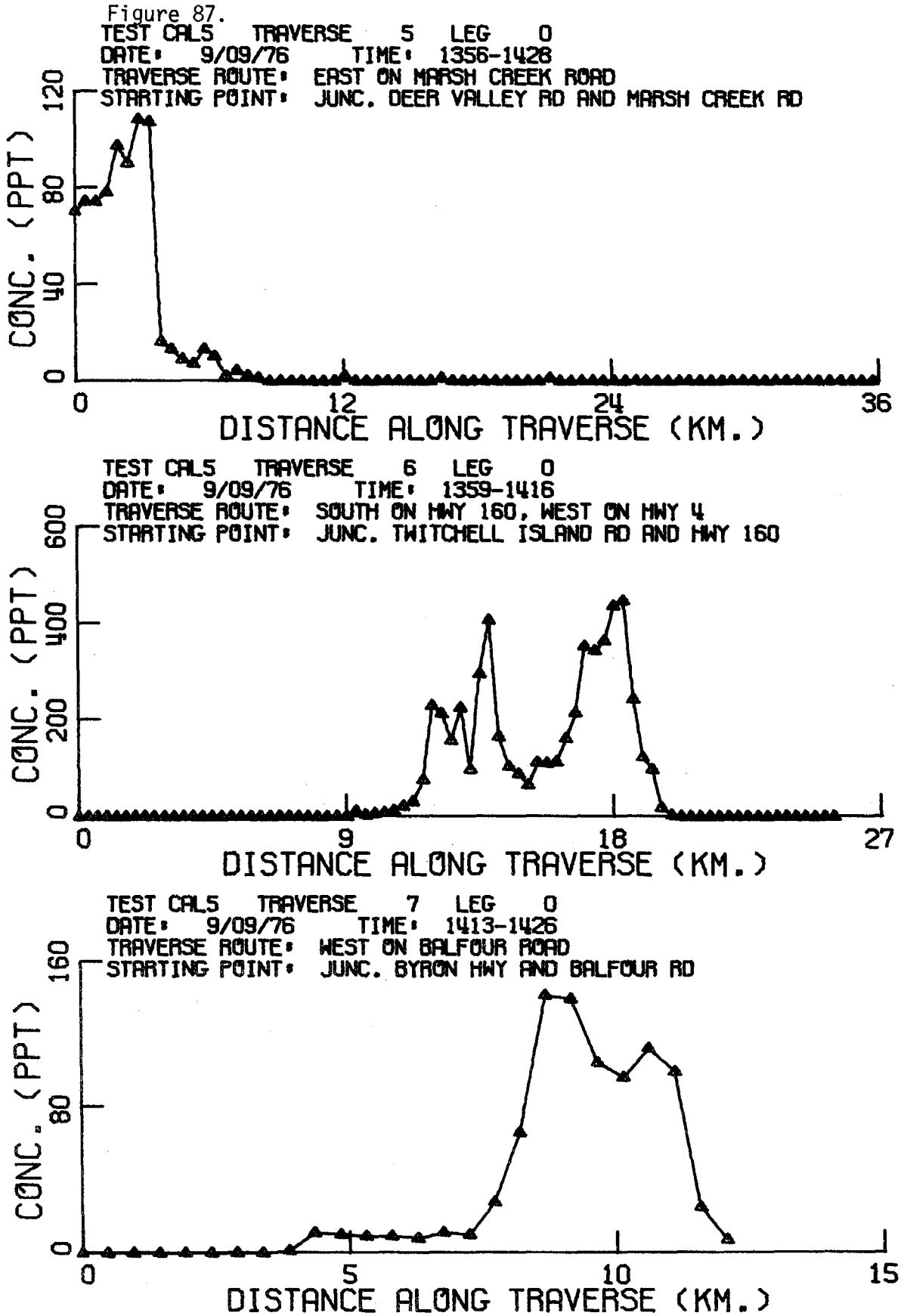

TEST CAL5 TRAVERSE 5 LEG 0
DATE: 9/09/76 TIME: 1356-1428
TRAVERSE ROUTE: EAST ON MARSH CREEK ROAD
STARTING POINT: JUNC. DEER VALLEY RD AND MARSH CREEK RD
CONC. (PPT)
0
40
80
120
0
12
24
36
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 6 LEG 0
DATE: 9/09/76 TIME: 1359-1416
TRAVERSE ROUTE: SOUTH ON HWY 160, WEST ON HWY 4
STARTING POINT: JUNC. TWITCHELL ISLAND RD AND HWY 160
CONC. (PPT)
0
200
400
600
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 7 LEG 0
DATE: 9/09/76 TIME: 1413-1426
TRAVERSE ROUTE: WEST ON BALFOUR ROAD
STARTING POINT: JUNC. BYRON HWY AND BALFOUR RD
CONC. (PPT)
0
80
160
0
5
10
15
DISTANCE ALONG TRAVERSE (KM.)

Figure 88.

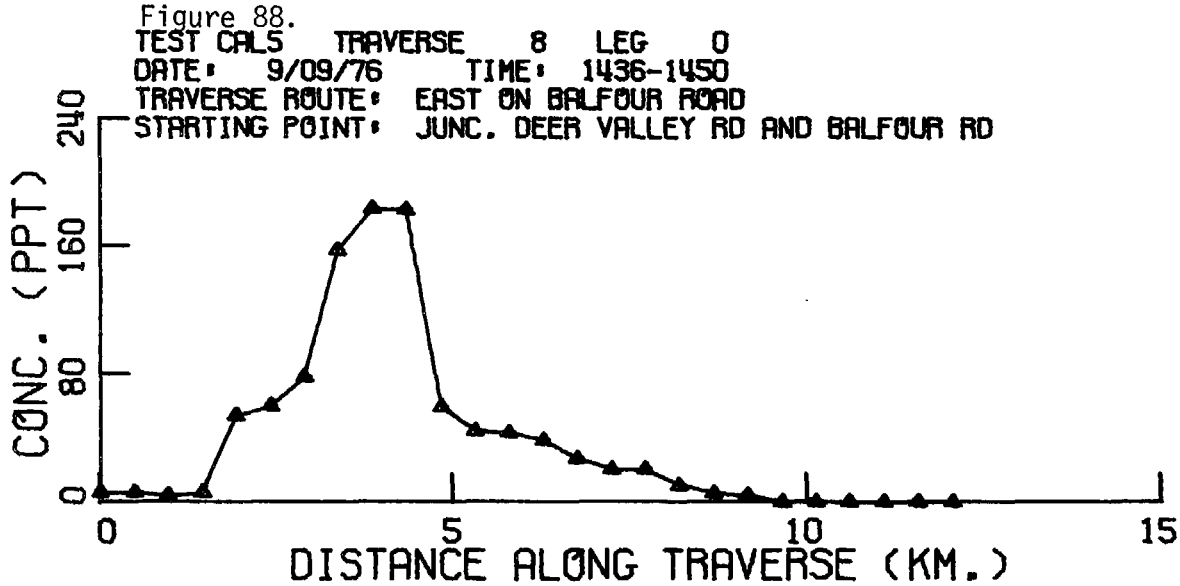

TEST CAL5 TRAVERSE 8 LEG 0
DATE: 9/09/76 TIME: 1436-1450
TRAVERSE ROUTE: EAST ON BALFOUR ROAD
STARTING POINT: JUNC. DEER VALLEY RD AND BALFOUR RD
CONC. (PPT)
0
80
160
240
0
5
10
15
DISTANCE ALONG TRAVERSE (KM.)

Figure 89.

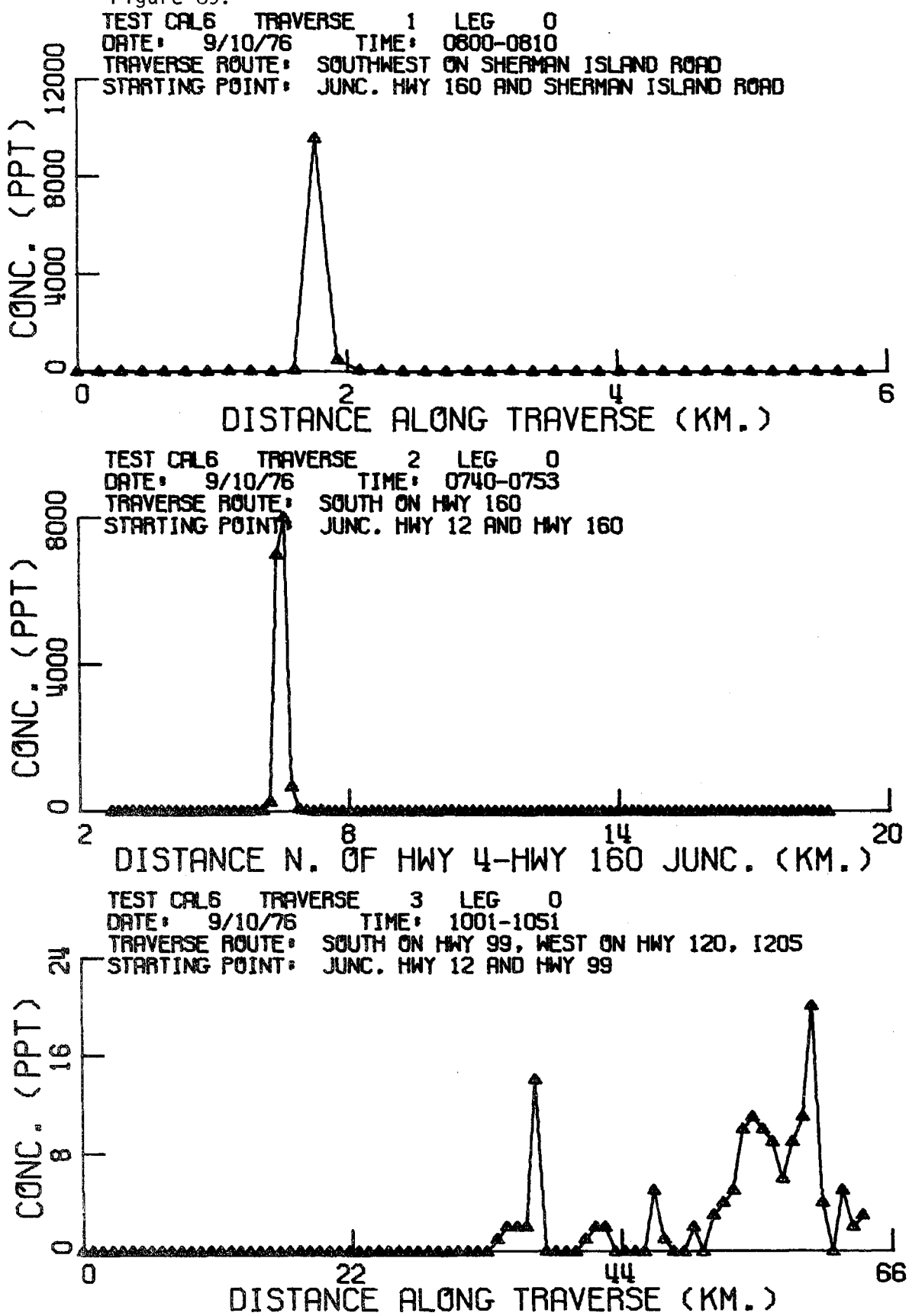

TEST CAL6 TRAVERSE 1 LEG 0
DATE: 9/10/76 TIME: 0800-0810
TRAVERSE ROUTE: SOUTHWEST ON SHERMAN ISLAND ROAD
STARTING POINT: JUNC. HWY 160 AND SHERMAN ISLAND ROAD
CONC. (PPT)
0
4000
8000
12000
0
2
4
6
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL6 TRAVERSE 2 LEG 0
DATE: 9/10/76 TIME: 0740-0753
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CONC. (PPT)
0
4000
8000
2
8
14
20
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL6 TRAVERSE 3 LEG 0
DATE: 9/10/76 TIME: 1001-1051
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 AND HWY 99
CONC. (PPT)
0
8
16
24
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 90.

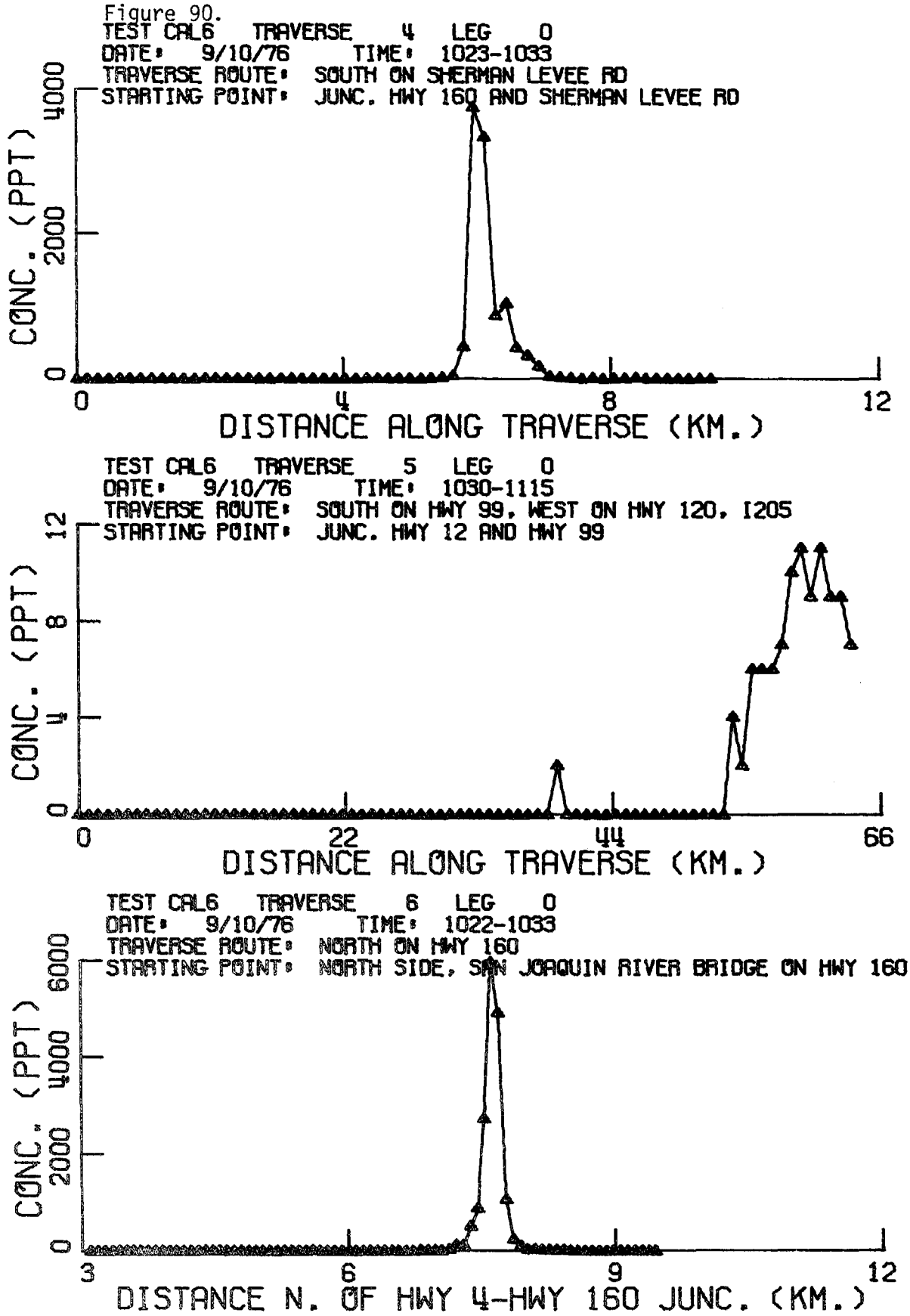

TEST CAL6 TRAVERSE 4 LEG 0
DATE: 9/10/76 TIME: 1023-1033
TRAVERSE ROUTE: SOUTH ON SHERMAN LEVEE RD
STARTING POINT: JUNC. HWY 160 AND SHERMAN LEVEE RD
CONC. (PPT)
0
2000
4000
0
4
8
12
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL6 TRAVERSE 5 LEG 0
DATE: 9/10/76 TIME: 1030-1115
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 AND HWY 99
CONC. (PPT)
0
4
8
12
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL6 TRAVERSE 6 LEG 0
DATE: 9/10/76 TIME: 1022-1033
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE, SAN JOAQUIN RIVER BRIDGE ON HWY 160
CONC. (PPT)
0
2000
4000
6000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 91.

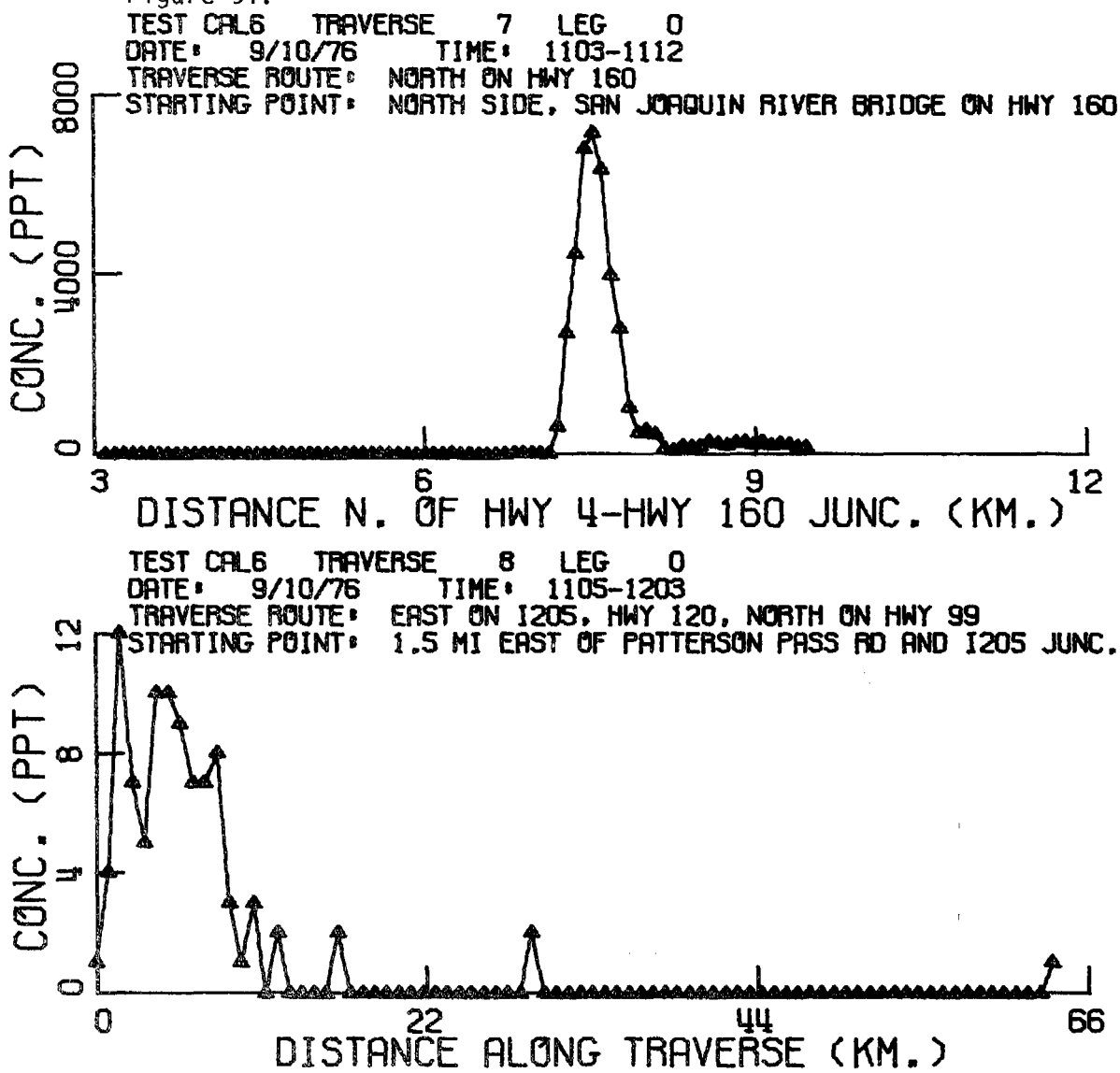

TEST CAL6 TRAVERSE 7 LEG 0
DATE: 9/10/76 TIME: 1103-1112
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE, SAN JOAQUIN RIVER BRIDGE ON HWY 160
CONC. (PPT)
0
4000
8000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL6 TRAVERSE 8 LEG 0
DATE: 9/10/76 TIME: 1105-1203
TRAVERSE ROUTE: EAST ON I205, HWY 120, NORTH ON HWY 99
STARTING POINT: 1.5 MI EAST OF PATTERSON PASS RD AND I205 JUNC.
CONC. (PPT)
0
4
8
12
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 92.

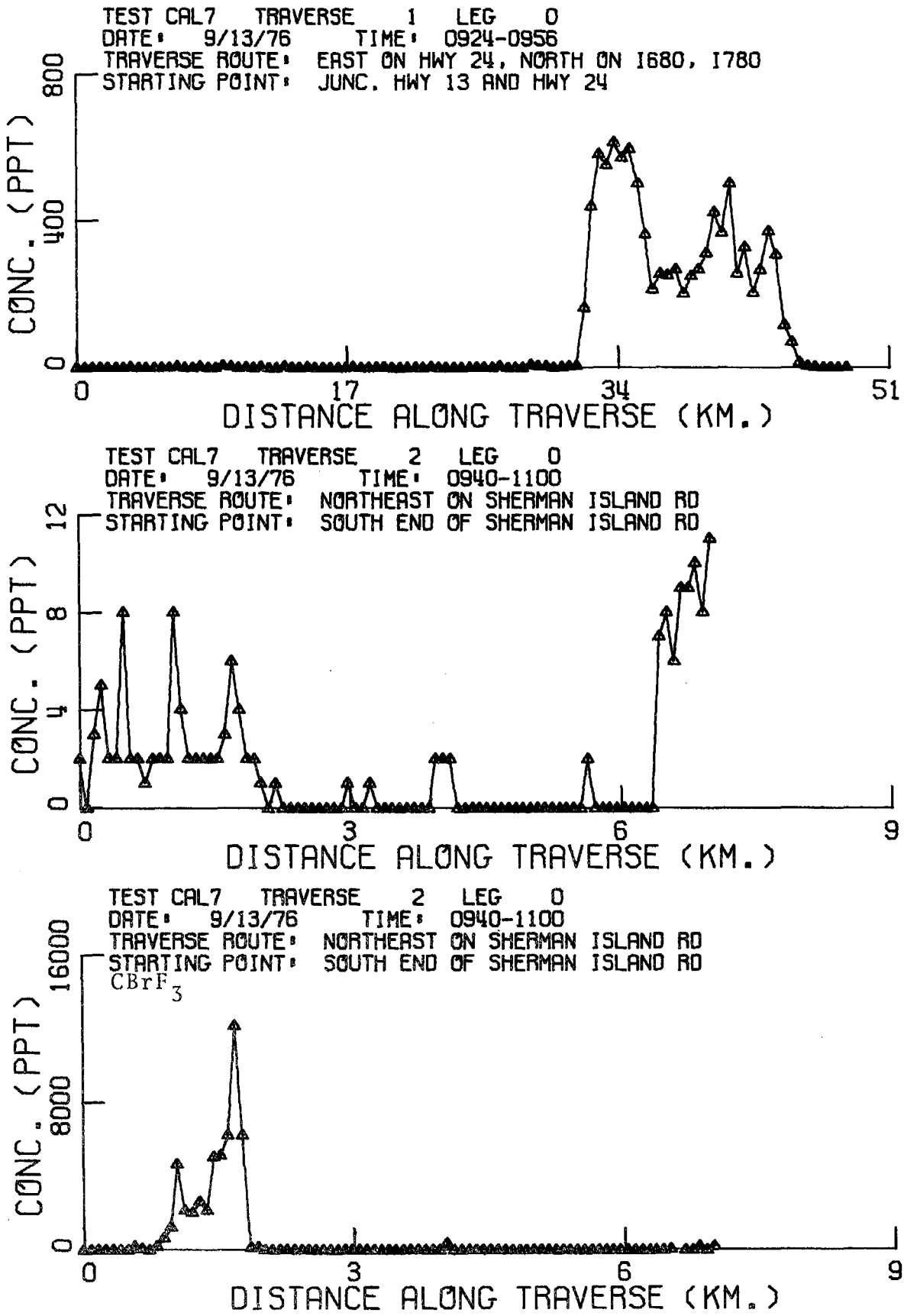

TEST CAL7 TRAVERSE 1 LEG 0
DATE: 9/13/76 TIME: 0924-0956
TRAVERSE ROUTE: EAST ON HWY 24, NORTH ON I680, I780
STARTING POINT: JUNC. HWY 13 AND HWY 24
CONC. (PPT)
0
400
800
0
17
34
51
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 2 LEG 0
DATE: 9/13/76 TIME: 0940-1100
TRAVERSE ROUTE: NORTHEAST ON SHERMAN ISLAND RD
STARTING POINT: SOUTH END OF SHERMAN ISLAND RD
CONC. (PPT)
0
4
8
12
0
3
6
9
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 2 LEG 0
DATE: 9/13/76 TIME: 0940-1100
TRAVERSE ROUTE: NORTHEAST ON SHERMAN ISLAND RD
STARTING POINT: SOUTH END OF SHERMAN ISLAND RD
CBrF3
CONC. (PPT)
0
8000
16000
0
3
6
9
DISTANCE ALONG TRAVERSE (KM.)

Figure 93.

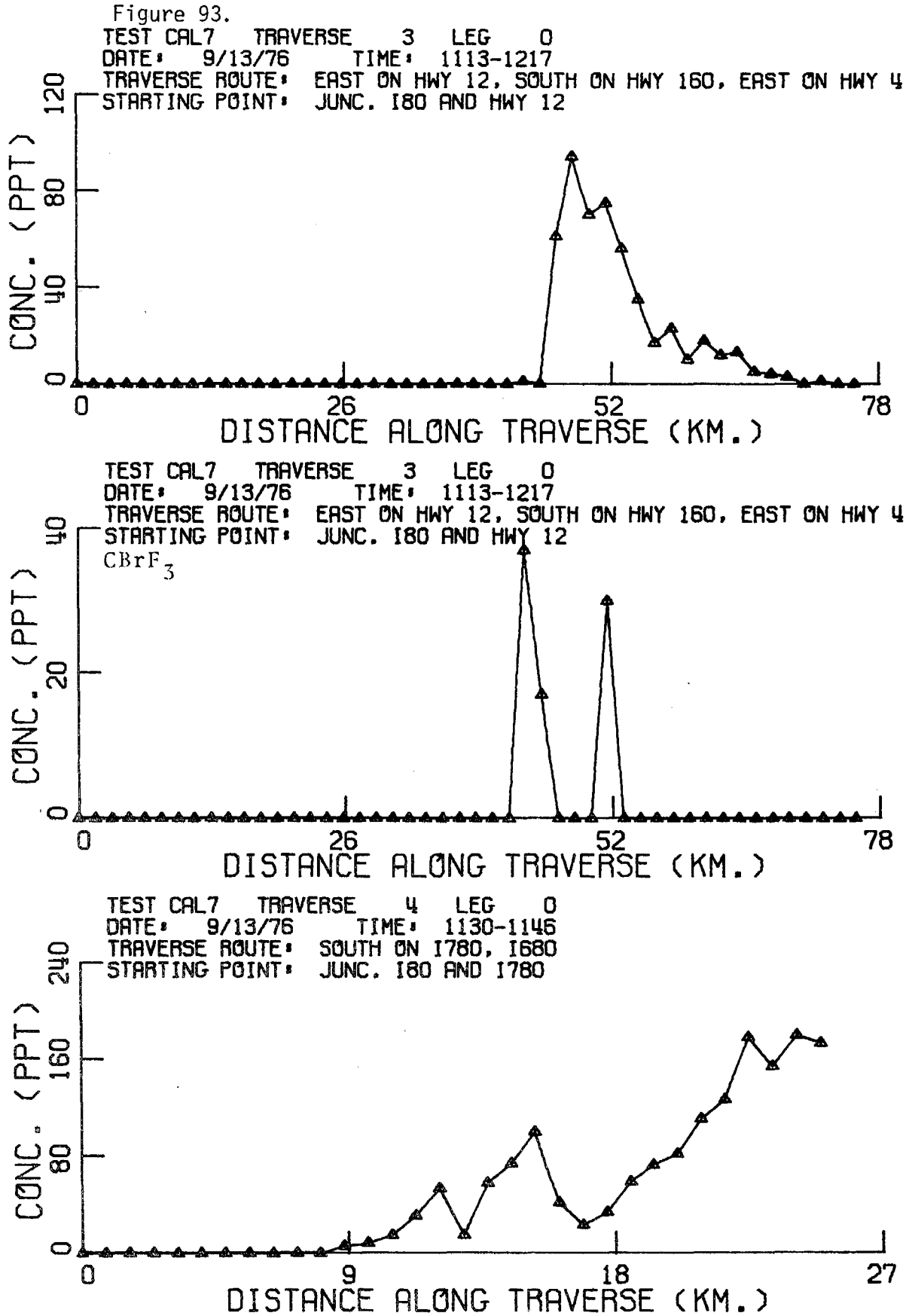

TEST CAL7 TRAVERSE 3 LEG 0
DATE: 9/13/76 TIME: 1113-1217
TRAVERSE ROUTE: EAST ON HWY 12, SOUTH ON HWY 160, EAST ON HWY 4
STARTING POINT: JUNC. I80 AND HWY 12
CONC. (PPT)
0
40
80
120
0
26
52
78
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 3 LEG 0
DATE: 9/13/76 TIME: 1113-1217
TRAVERSE ROUTE: EAST ON HWY 12, SOUTH ON HWY 160, EAST ON HWY 4
STARTING POINT: JUNC. I80 AND HWY 12
CBrF3
CONC. (PPT)
0
20
40
0
26
52
78
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 4 LEG 0
DATE: 9/13/76 TIME: 1130-1146
TRAVERSE ROUTE: SOUTH ON I780, I680
STARTING POINT: JUNC. I80 AND I780
CONC. (PPT)
0
80
160
240
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)

Figure 94.

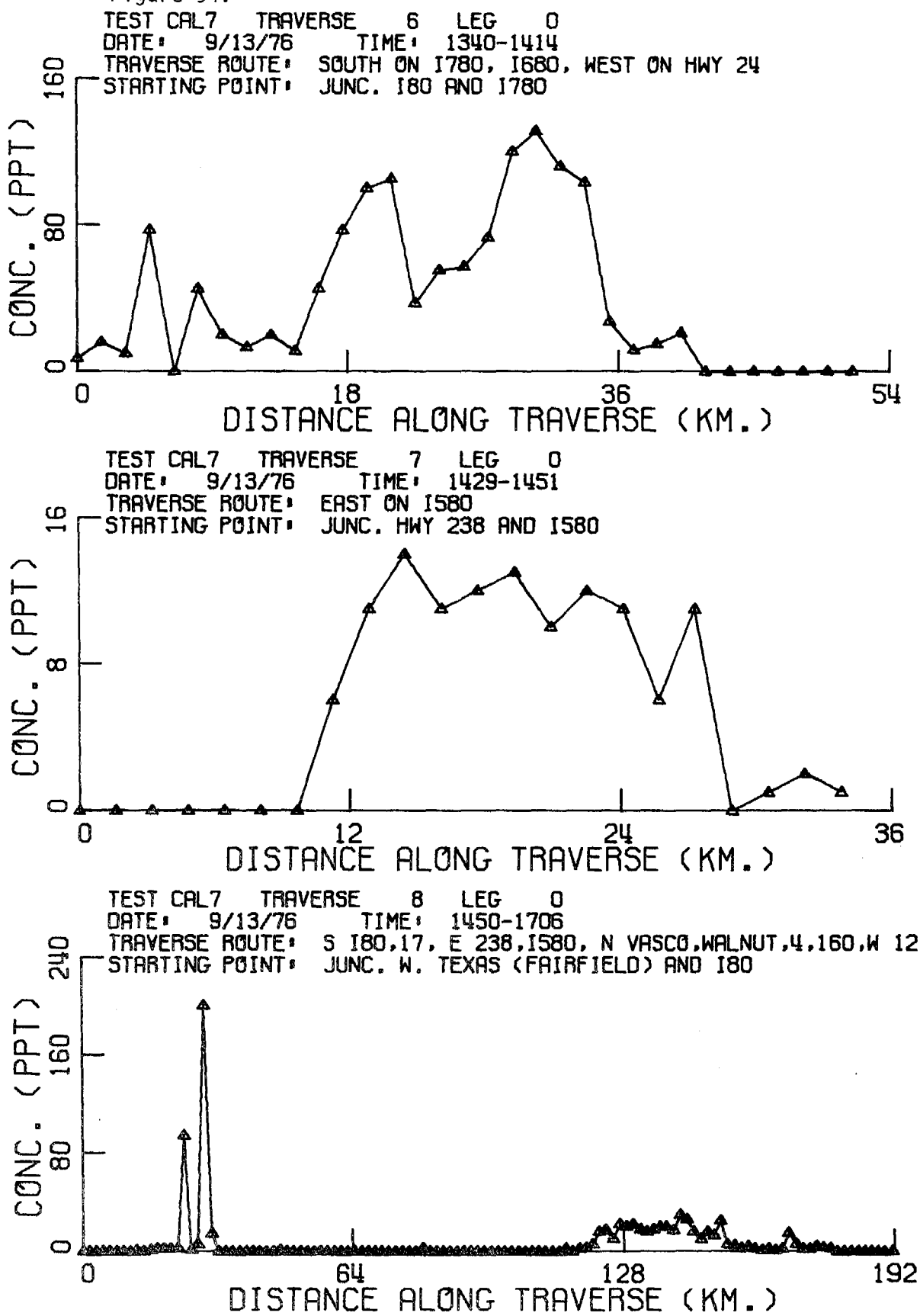

TEST CAL7 TRAVERSE 6 LEG 0
DATE: 9/13/76 TIME: 1340-1414
TRAVERSE ROUTE: SOUTH ON I780, I680, WEST ON HWY 24
STARTING POINT: JUNC. I80 AND I780
CONC. (PPT)
0
80
160
0
18
36
54
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 7 LEG 0
DATE: 9/13/76 TIME: 1429-1451
TRAVERSE ROUTE: EAST ON I580
STARTING POINT: JUNC. HWY 238 AND I580
CONC. (PPT)
0
8
16
0
12
24
36
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 8 LEG 0
DATE: 9/13/76 TIME: 1450-1706
TRAVERSE ROUTE: S I80,17, E 238,I580, N VASCO,WALNUT,4,160,W 12
STARTING POINT: JUNC. W. TEXAS (FAIRFIELD) AND I80
CONC. (PPT)
0
80
160
240
0
64
128
192
DISTANCE ALONG TRAVERSE (KM.)

Figure 95.

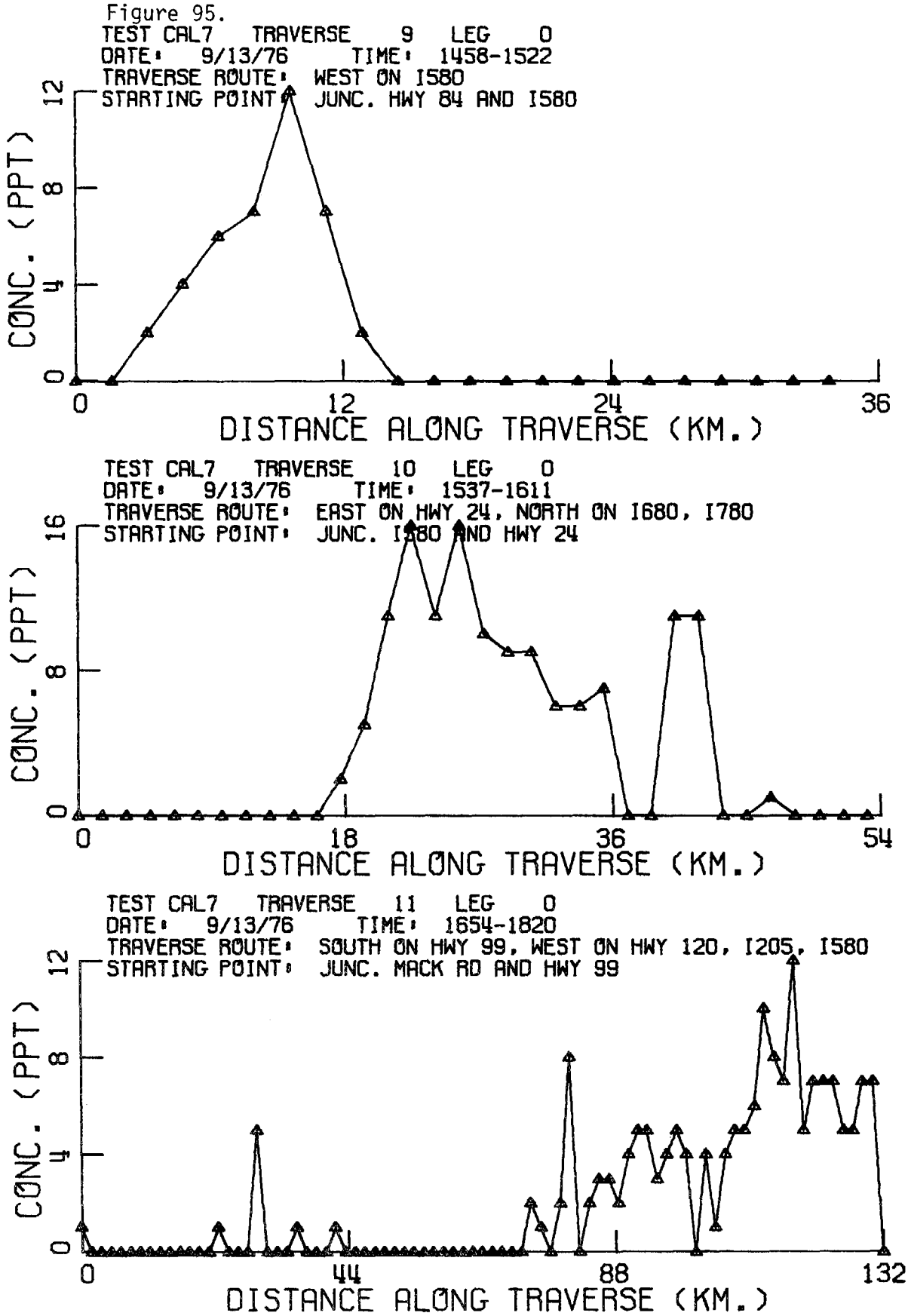

TEST CAL7 TRAVERSE 9 LEG 0
DATE: 9/13/76 TIME: 1458-1522
TRAVERSE ROUTE: WEST ON I580
STARTING POINT: JUNC. HWY 84 AND I580
CONC. (PPT)
0
4
8
12
0
12
24
36
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 10 LEG 0
DATE: 9/13/76 TIME: 1537-1611
TRAVERSE ROUTE: EAST ON HWY 24, NORTH ON I680, I780
STARTING POINT: JUNC. I580 AND HWY 24
CONC. (PPT)
0
8
16
0
18
36
54
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 11 LEG 0
DATE: 9/13/76 TIME: 1654-1820
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205, I580
STARTING POINT: JUNC. MACK RD AND HWY 99
CONC. (PPT)
0
4
8
12
0
44
88
132
DISTANCE ALONG TRAVERSE (KM.)

Figure 96.

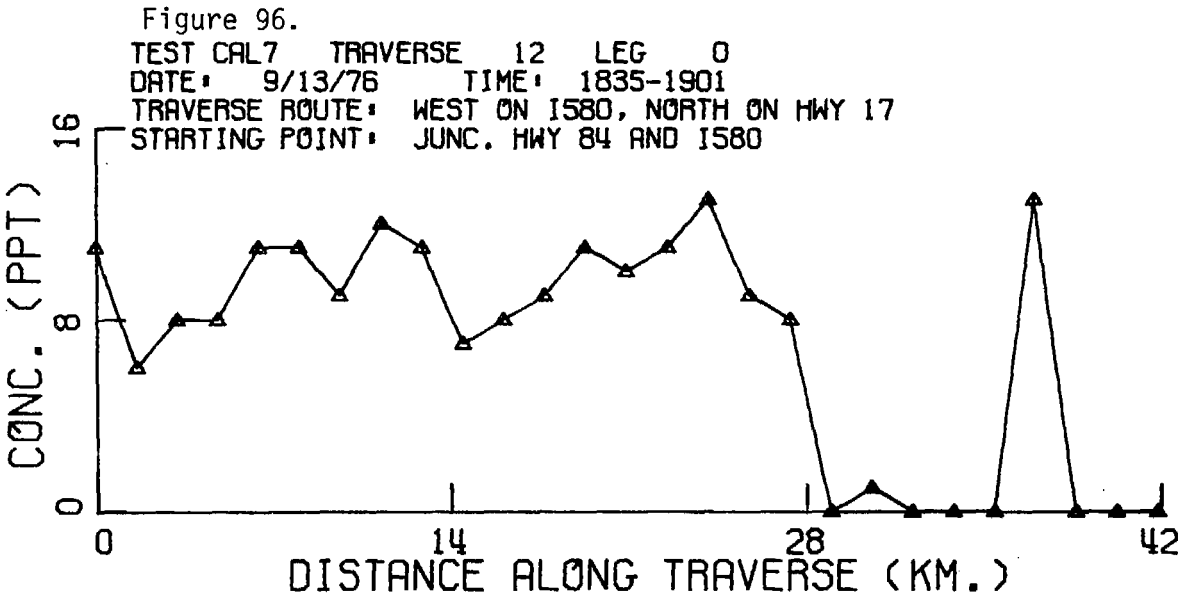

TEST CAL7 TRAVERSE 12 LEG 0
DATE: 9/13/76 TIME: 1835-1901
TRAVERSE ROUTE: WEST ON I580, NORTH ON HWY 17
STARTING POINT: JUNC. HWY 84 AND I580
CONC. (PPT)
0
8
16
0
14
28
42
DISTANCE ALONG TRAVERSE (KM.)

Figure 97.

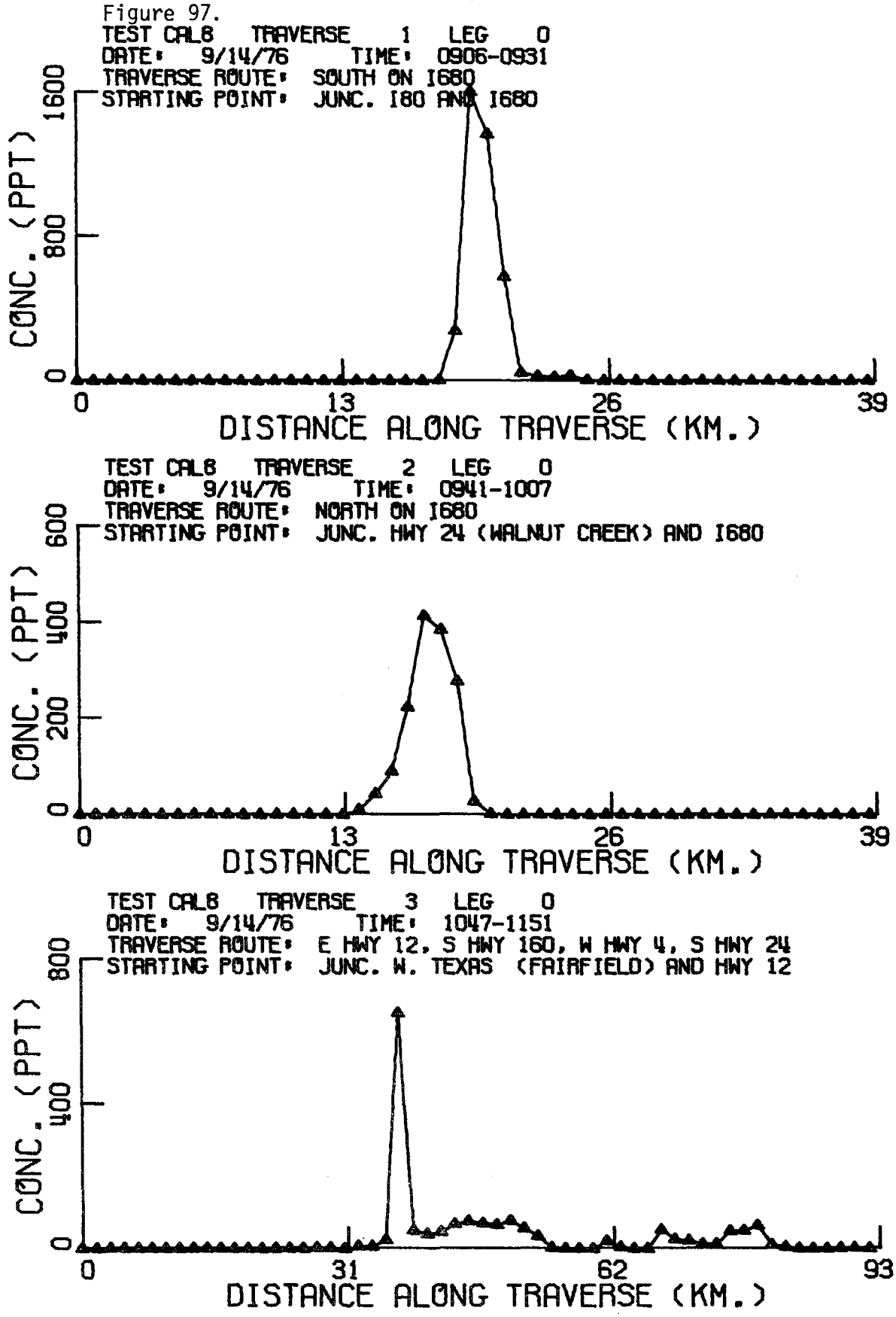
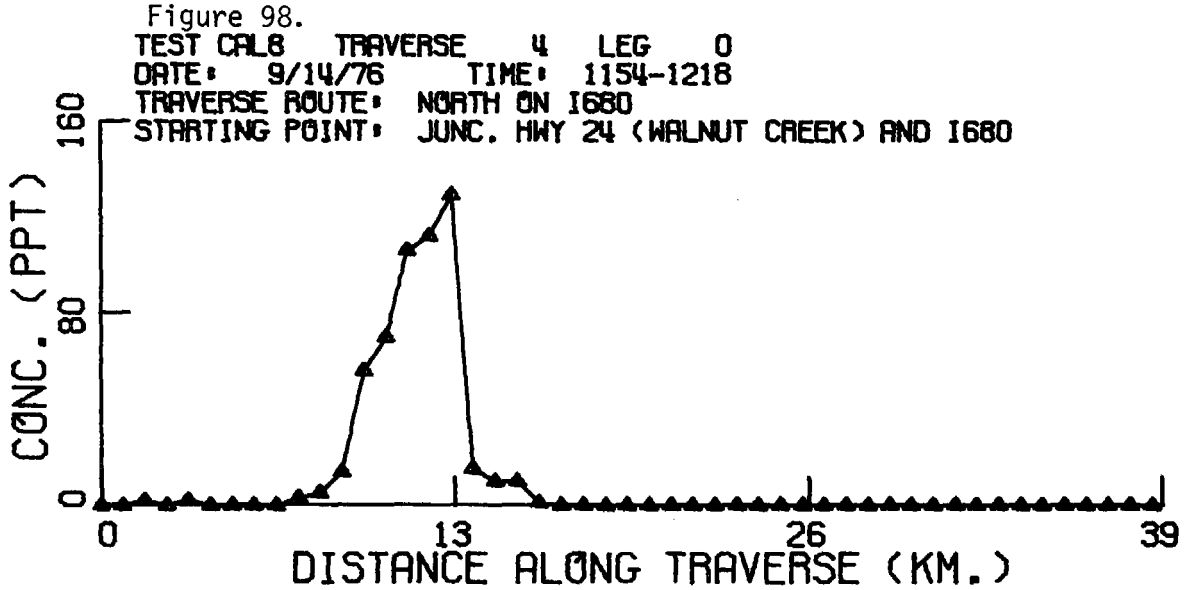

TEST CAL8 TRAVERSE 1 LEG 0
DATE: 9/14/76 TIME: 0906-0931
TRAVERSE ROUTE: SOUTH ON I680
STARTING POINT: JUNC. I80 AND I680
CONC. (PPT)
0
800
1600
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 2 LEG 0
DATE: 9/14/76 TIME: 0941-1007
TRAVERSE ROUTE: NORTH ON I680
STARTING POINT: JUNC. HWY 24 (WALNUT CREEK) AND I680
CONC. (PPT)
0
200
400
600
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 3 LEG 0
DATE: 9/14/76 TIME: 1047-1151
TRAVERSE ROUTE: E HWY 12, S HWY 160, W HWY 4, S HWY 24
STARTING POINT: JUNC. W. TEXAS (FAIRFIELD) AND HWY 12
CONC. (PPT)
0
400
800
0
31
62
93
DISTANCE ALONG TRAVERSE (KM.)

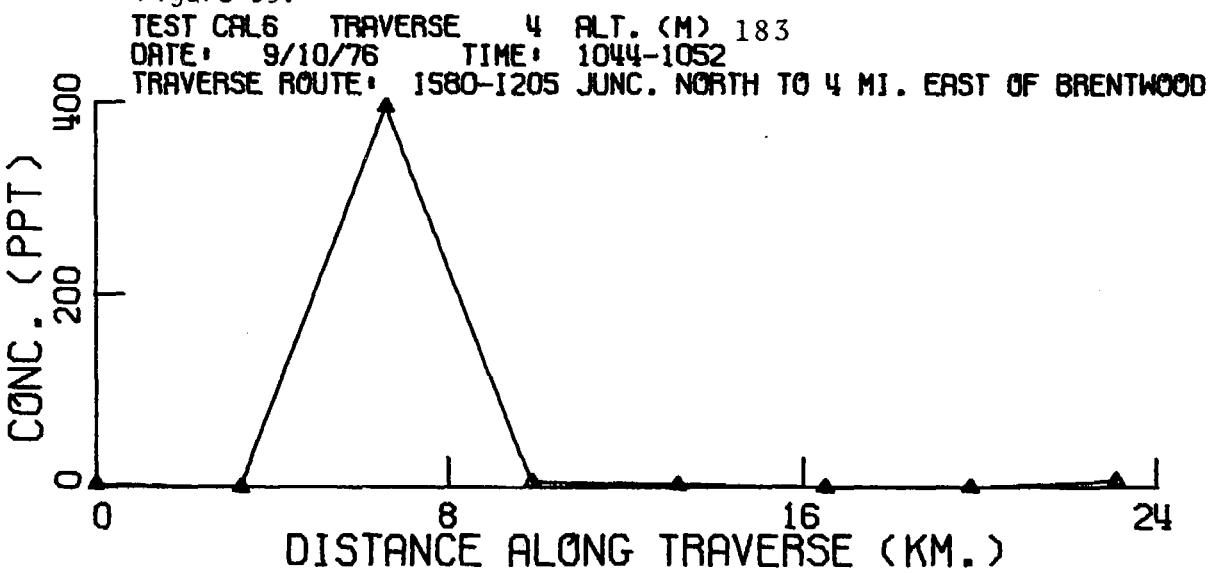
Figure 98.

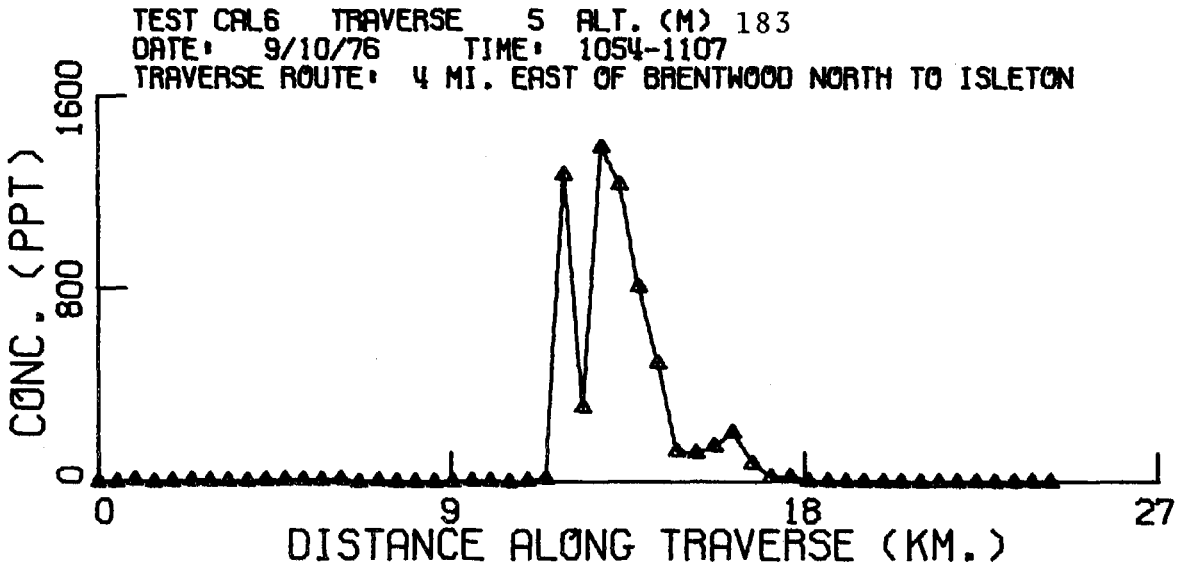

TEST CAL8 TRAVERSE 4 LEG 0
DATE: 9/14/76 TIME: 1154-1218
TRAVERSE ROUTE: NORTH ON I680
STARTING POINT: JUNC. HWY 24 (WALNUT CREEK) AND I680
CONC. (PPT)
160
80
0
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)

3.4 Airborne Traverse Tracer Data

The airborne traverse tracer data are plotted in the following figures as concentration versus distance along the traverse. The altitudes of the traverse are given in meters above sea level. The topography of the region is such that it is reasonable to assume the specified altitude corresponds to the height above the surface.

Figure 99.


TEST CAL6 TRAVERSE 4 ALT. (M) 183
DATE: 9/10/76 TIME: 1044-1052
TRAVERSE ROUTE: I580-I205 JUNC. NORTH TO 4 MI. EAST OF BRENTWOOD
CONC. (PPT)
0
200
400
0
8
16
24
DISTANCE ALONG TRAVERSE (KM.)


TEST CAL6 TRAVERSE 5 ALT. (M) 183
DATE: 9/10/76 TIME: 1054-1107
TRAVERSE ROUTE: 4 MI. EAST OF BRENTWOOD NORTH TO ISLETON
CONC. (PPT)
0
800
1600
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)

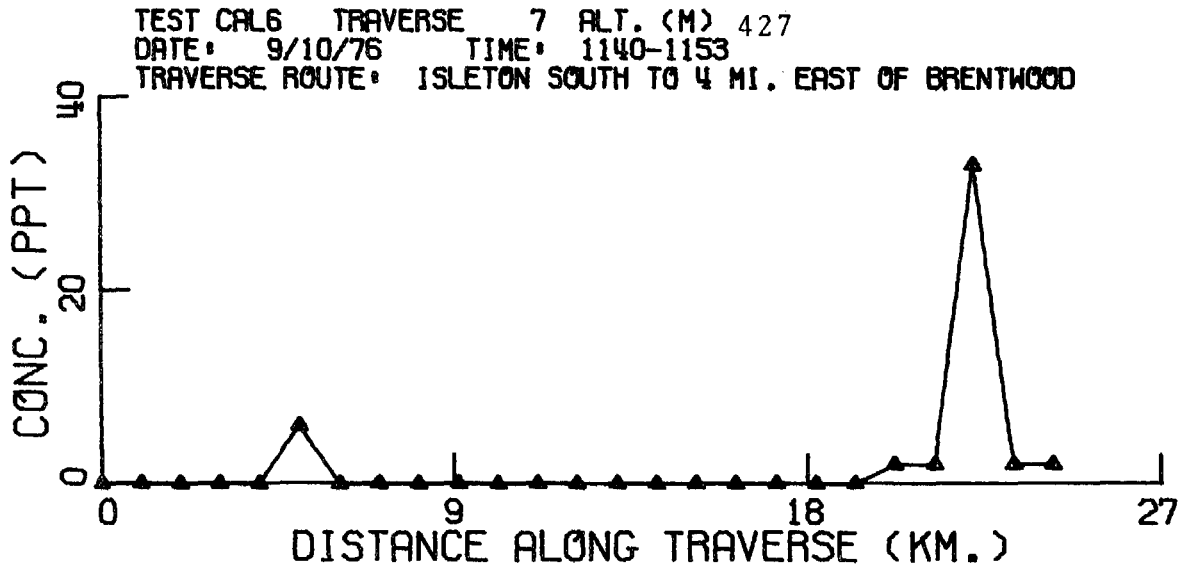
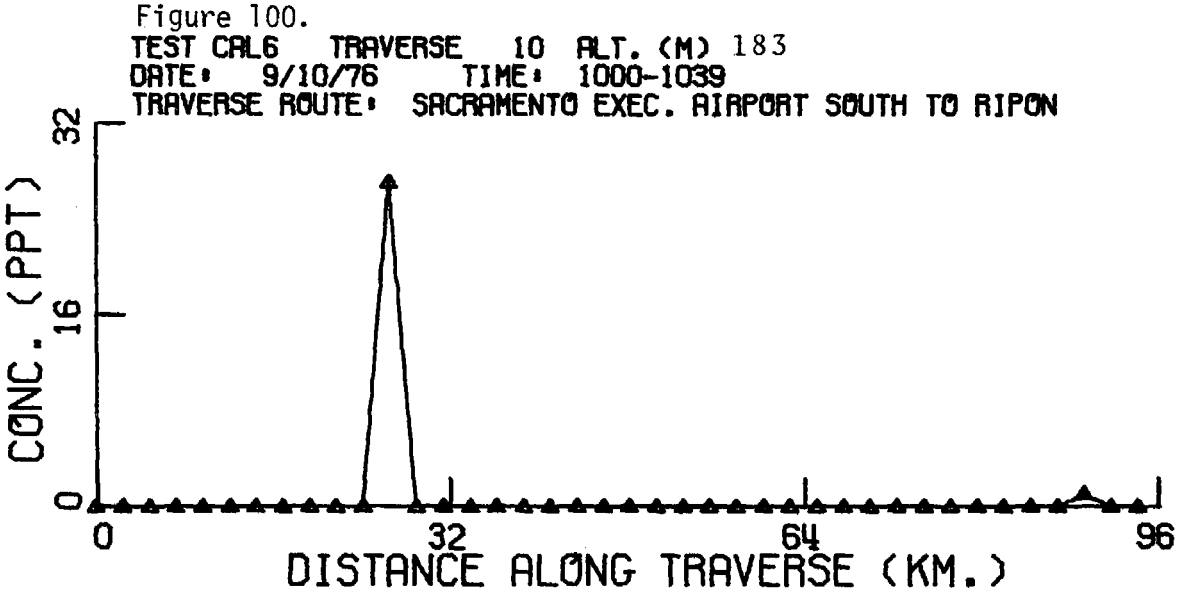

TEST CAL6 TRAVERSE 7 ALT. (M) 427
DATE: 9/10/76 TIME: 1140-1153
TRAVERSE ROUTE: ISLETON SOUTH TO 4 MI. EAST OF BRENTWOOD
CONC. (PPT)
0
20
40
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)

Figure 100.


TEST CAL6 TRAVERSE 10 ALT. (M) 183
DATE: 9/10/76 TIME: 1000-1039
TRAVERSE ROUTE: SACRAMENTO EXEC. AIRPORT SOUTH TO RIPON
CONC. (PPT)
0
16
32
0
32
64
96
DISTANCE ALONG TRAVERSE (KM.)

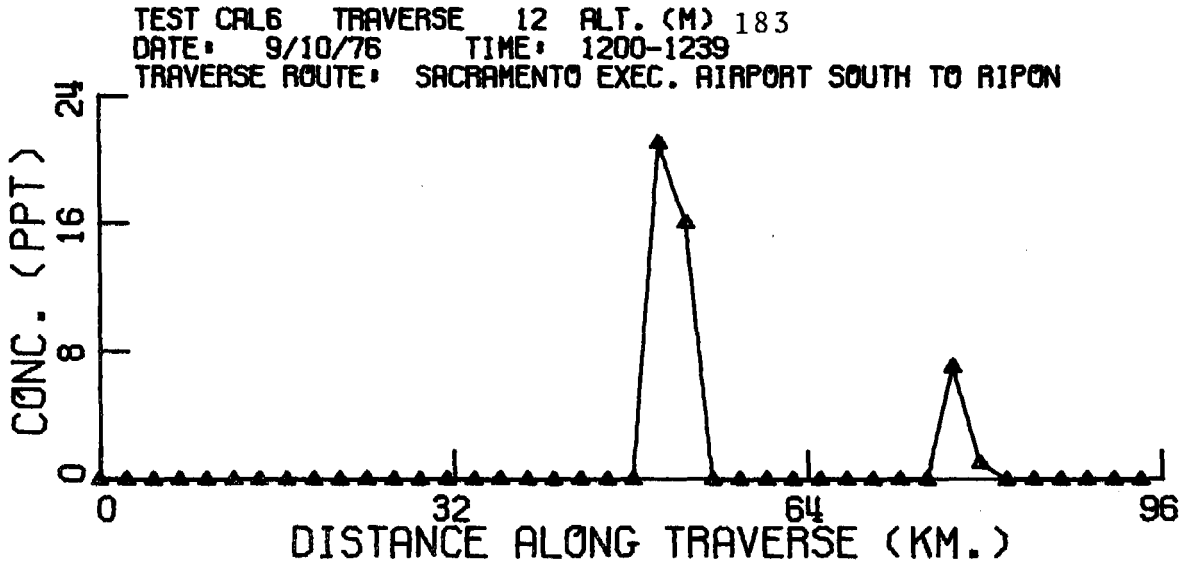

TEST CAL6 TRAVERSE 12 ALT. (M) 183
DATE: 9/10/76 TIME: 1200-1239
TRAVERSE ROUTE: SACRAMENTO EXEC. AIRPORT SOUTH TO RIPON
CONC. (PPT)
0
8
16
24
0
32
64
96
DISTANCE ALONG TRAVERSE (KM.)

Figure 101.

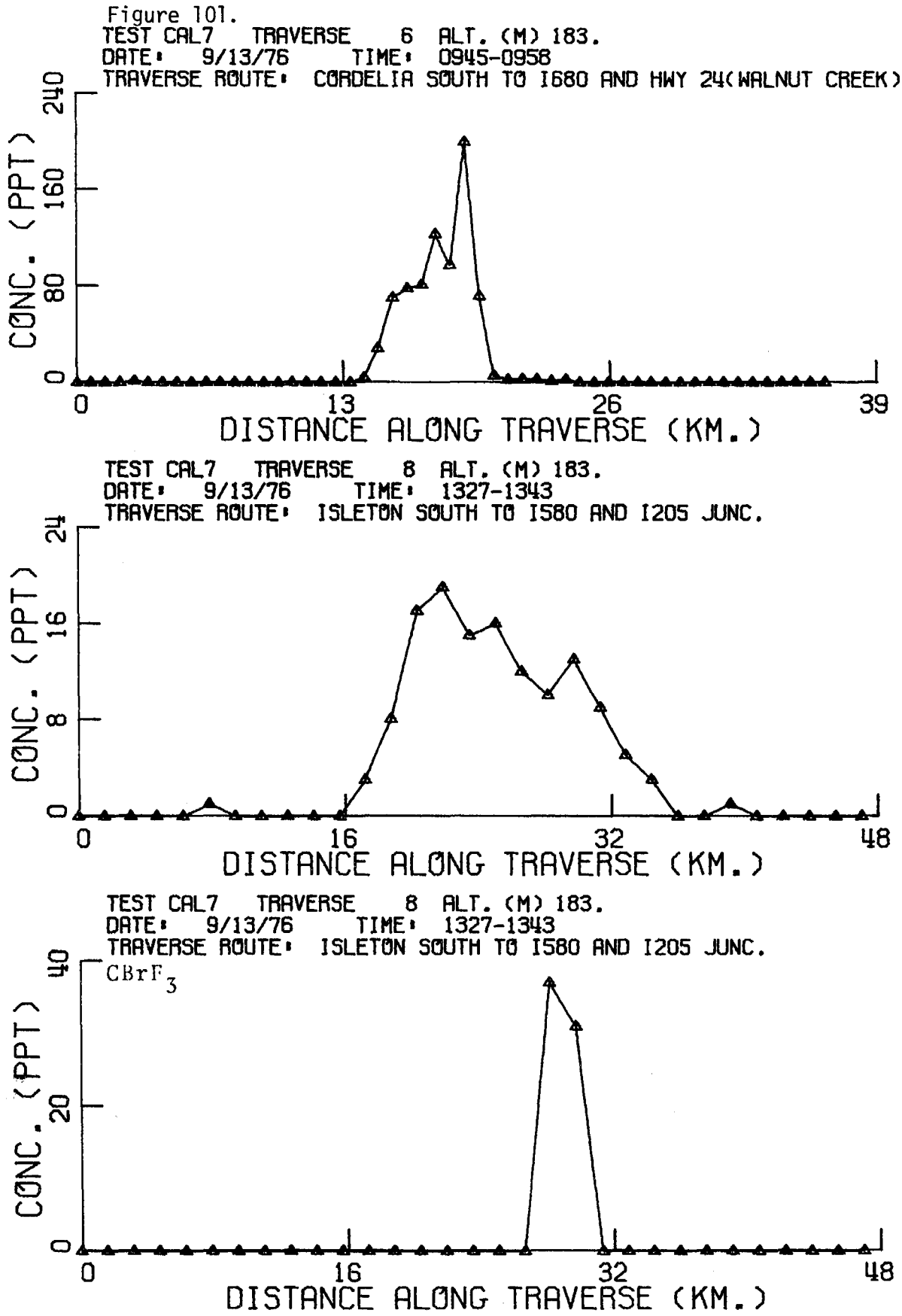

TEST CAL7 TRAVERSE 6 ALT. (M) 183.
DATE: 9/13/76 TIME: 0945-0958
TRAVERSE ROUTE: CORDELIA SOUTH TO I680 AND HWY 24(WALNUT CREEK)
CONC. (PPT)
0
80
160
240
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 8 ALT. (M) 183.
DATE: 9/13/76 TIME: 1327-1343
TRAVERSE ROUTE: ISLETON SOUTH TO I580 AND I205 JUNC.
CONC. (PPT)
0
8
16
24
0
16
32
48
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 8 ALT. (M) 183.
DATE: 9/13/76 TIME: 1327-1343
TRAVERSE ROUTE: ISLETON SOUTH TO I580 AND I205 JUNC.
CBrF3
CONC. (PPT)
0
20
40
0
16
32
48
DISTANCE ALONG TRAVERSE (KM.)

Figure 102.

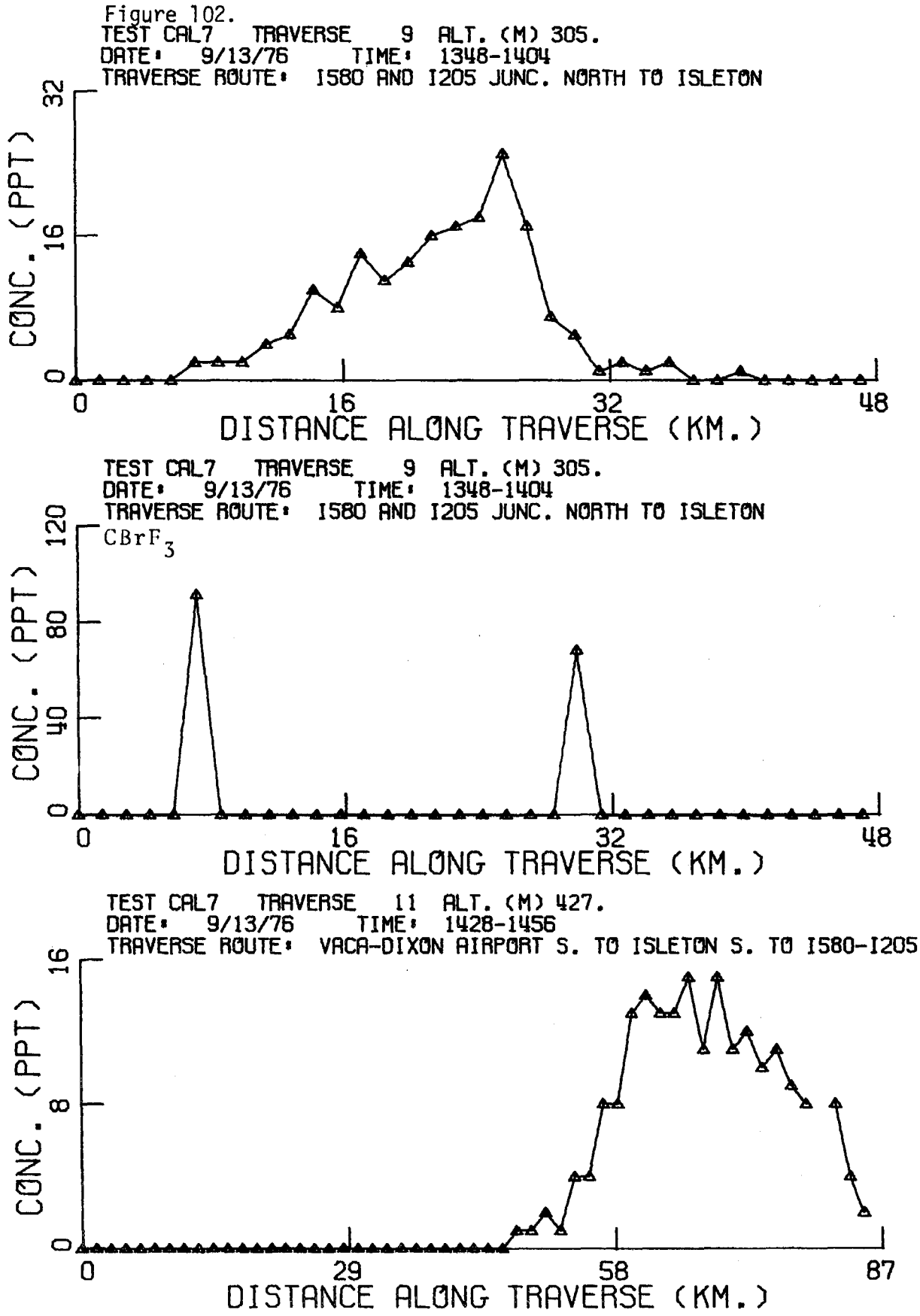

TEST CAL7 TRAVERSE 9 ALT. (M) 305.
DATE: 9/13/76 TIME: 1348-1404
TRAVERSE ROUTE: I580 AND I205 JUNC. NORTH TO ISLETON
CONC. (PPT)
0
16
32
0
16
32
48
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 9 ALT. (M) 305.
DATE: 9/13/76 TIME: 1348-1404
TRAVERSE ROUTE: I580 AND I205 JUNC. NORTH TO ISLETON
CBrF3
CONC. (PPT)
0
40
80
120
0
16
32
48
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 11 ALT. (M) 427.
DATE: 9/13/76 TIME: 1428-1456
TRAVERSE ROUTE: VACA-DIXON AIRPORT S. TO ISLETON S. TO I580-I205
CONC. (PPT)
0
8
16
0
29
58
87
DISTANCE ALONG TRAVERSE (KM.)

Figure 103.
TEST CAL7 TRAVERSE 12 ALT. (M) 457.
DATE: 9/13/76 TIME: 1759-1812
TRAVERSE ROUTE: LIVERMORE AIRPORT EAST TO I5 AND I205 JUNC.

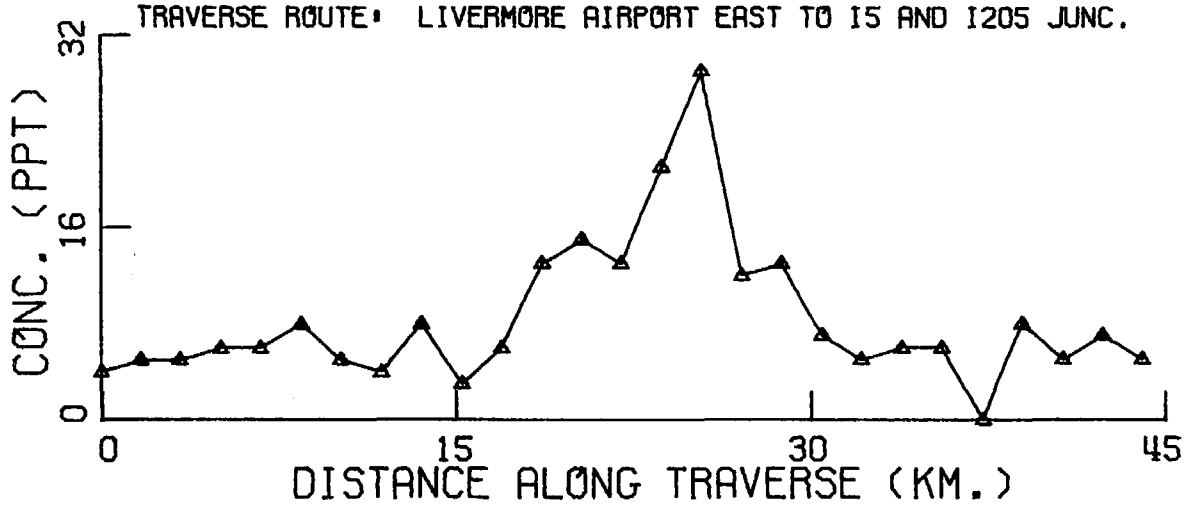


Figure 104.

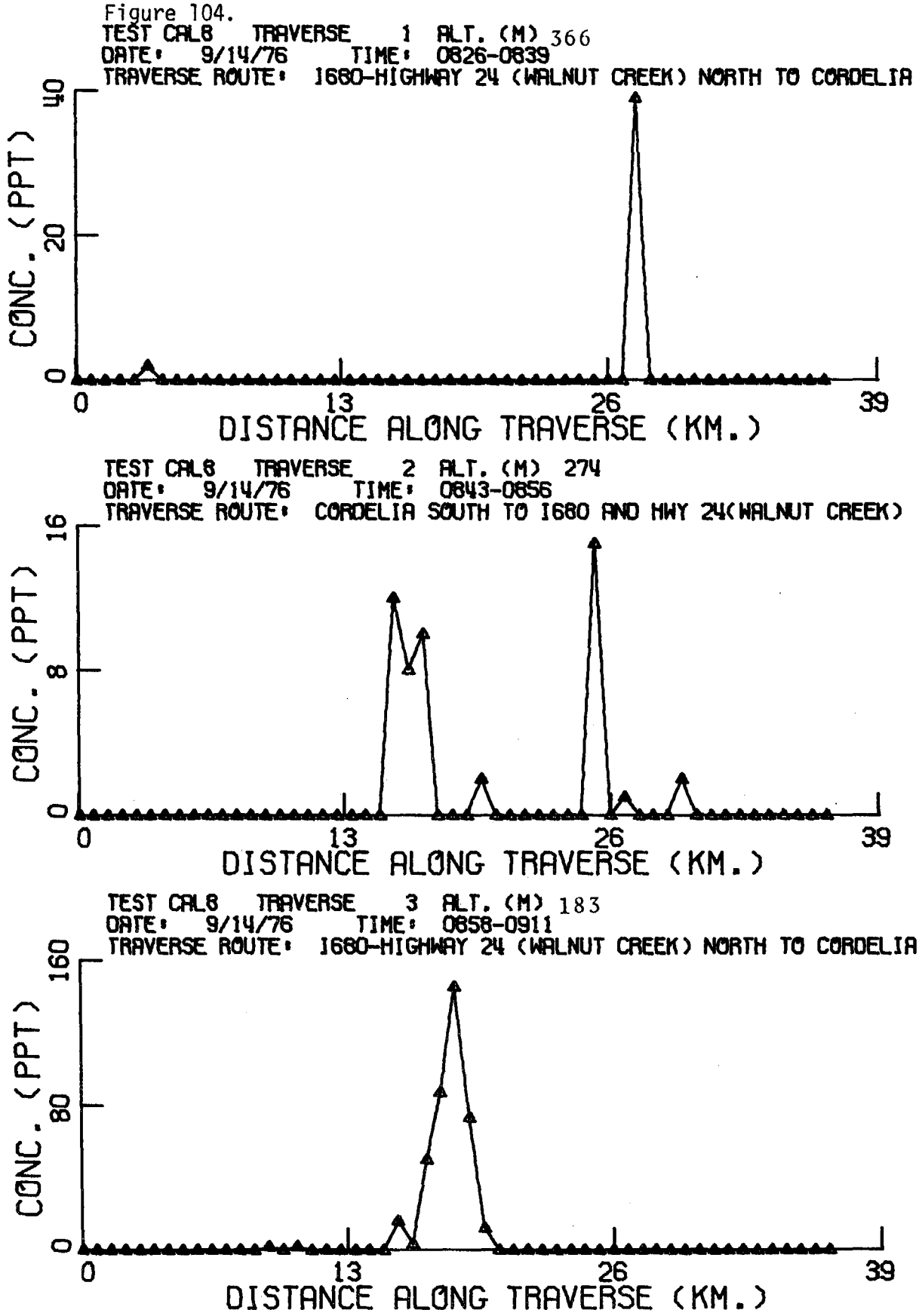
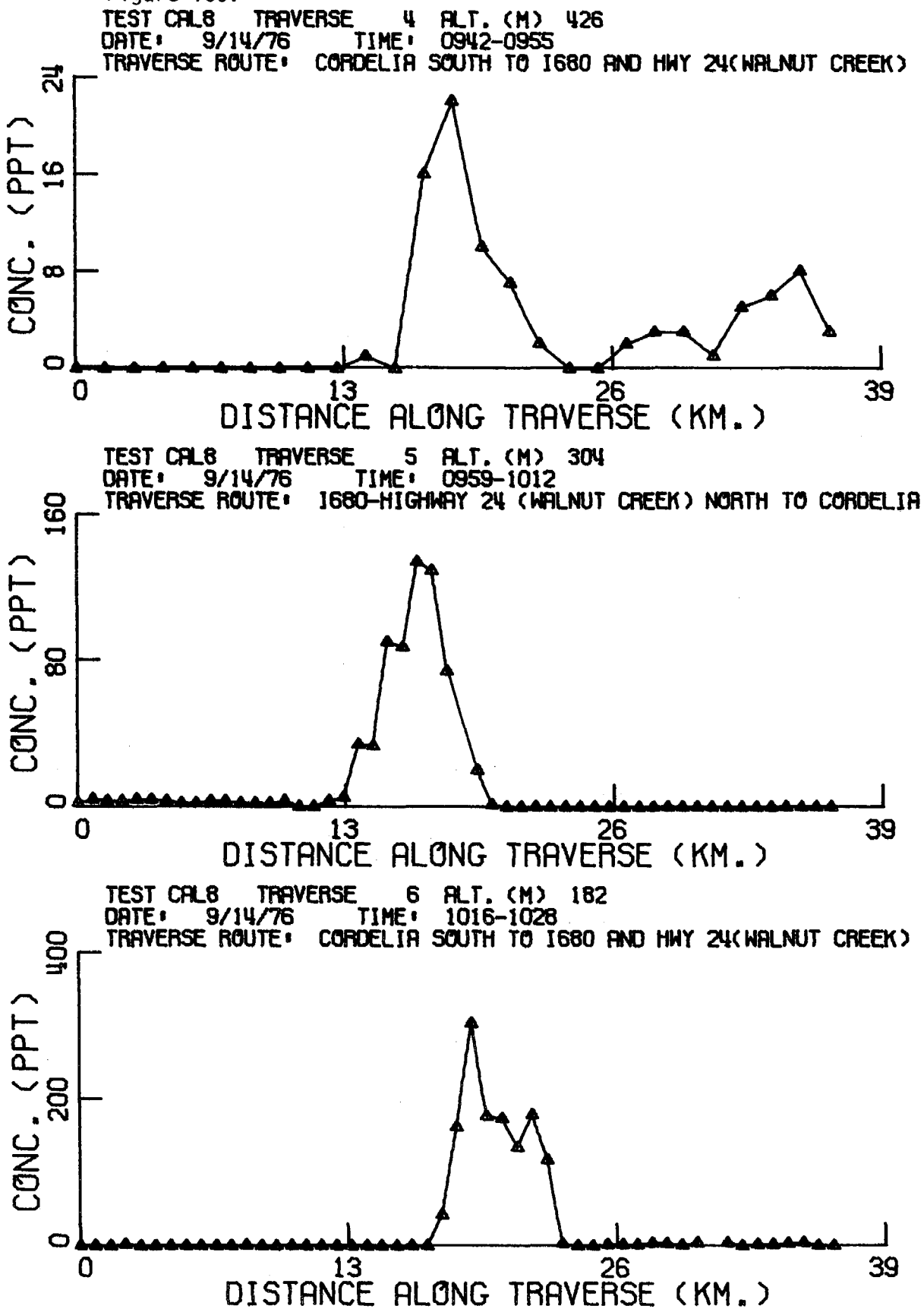

TEST CAL8 TRAVERSE 1 ALT. (M) 366
DATE: 9/14/76 TIME: 0826-0839
TRAVERSE ROUTE: I680-HIGHWAY 24 (WALNUT CREEK) NORTH TO CORDELIA
CONC. (PPT)
0
20
40
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 2 ALT. (M) 274
DATE: 9/14/76 TIME: 0843-0856
TRAVERSE ROUTE: CORDELIA SOUTH TO I680 AND HWY 24(WALNUT CREEK)
CONC. (PPT)
0
8
16
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 3 ALT. (M) 183
DATE: 9/14/76 TIME: 0858-0911
TRAVERSE ROUTE: I680-HIGHWAY 24 (WALNUT CREEK) NORTH TO CORDELIA
CONC. (PPT)
0
80
160
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)

Figure 105.


TEST CAL8 TRAVERSE 4 ALT. (M) 426
DATE: 9/14/76 TIME: 0942-0955
TRAVERSE ROUTE: CORDELIA SOUTH TO I680 AND HWY 24(WALNUT CREEK)
CONC. (PPT)
0
8
16
24
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 5 ALT. (M) 304
DATE: 9/14/76 TIME: 0959-1012
TRAVERSE ROUTE: I680-HIGHWAY 24 (WALNUT CREEK) NORTH TO CORDELIA
CONC. (PPT)
0
80
160
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 6 ALT. (M) 182
DATE: 9/14/76 TIME: 1016-1028
TRAVERSE ROUTE: CORDELIA SOUTH TO I680 AND HWY 24(WALNUT CREEK)
CONC. (PPT)
0
200
400
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)

3.5 Airborne Spiral Tracer Data

The airborne spiral tracer data (for maximum concentrations greater than, or equal to, 10 ppt) are plotted as concentration versus height above sea level in the following figures. Spiral 6-1 was taken over Frank's Tract Recreation Area, directly east of the Dow site; spirals 7-1, 7-3, and 8-1 were taken 0.5 miles north of the Port Chicago Naval Magazine, east of the Carquinez Strait; and spiral 7-9 was taken over Stockton Metropolitan airport.

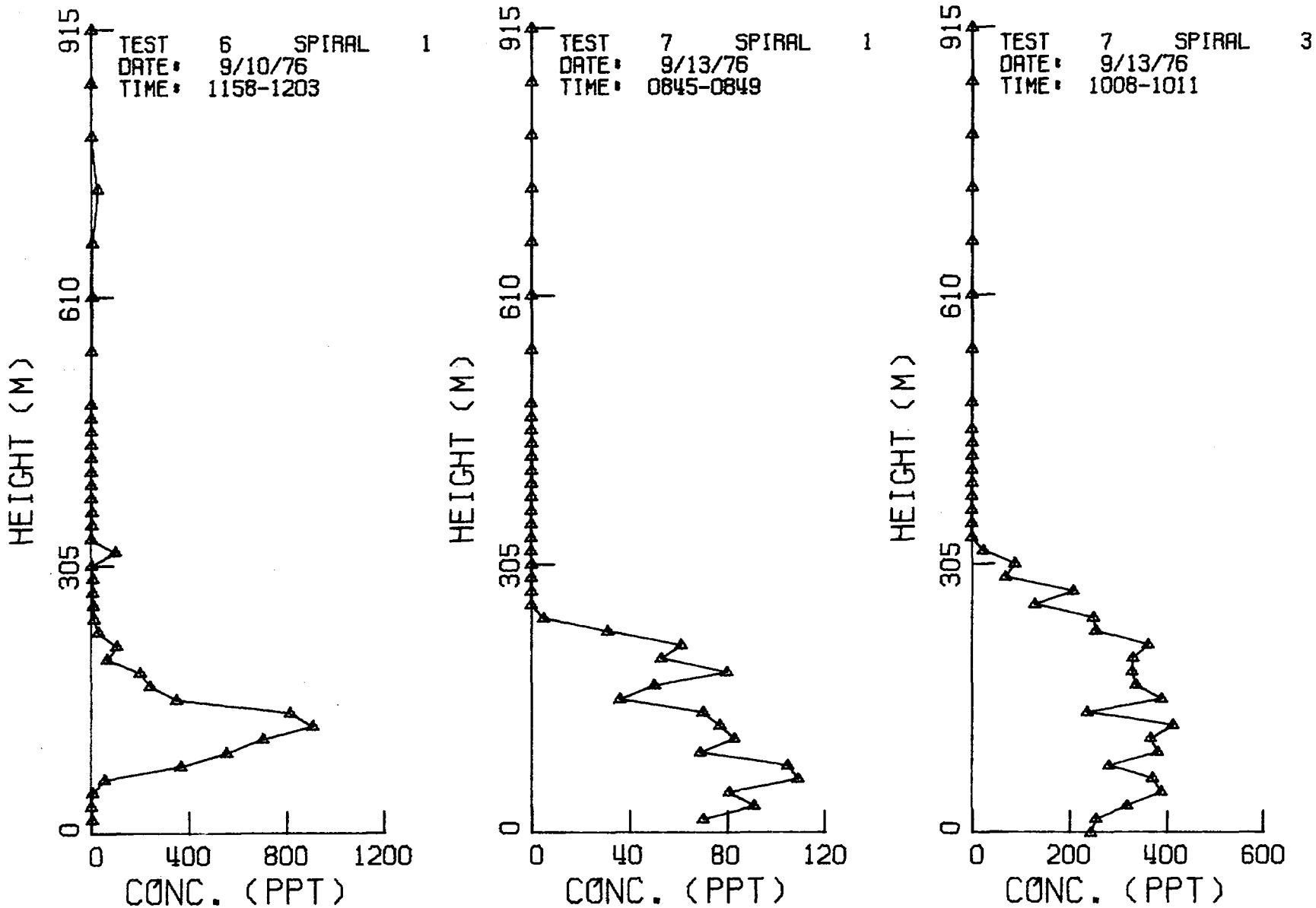

TEST 6 SPIRAL 1
DATE: 9/10/76
TIME: 1158-1203
TEST 7 SPIRAL 1
DATE: 9/13/76
TIME: 0845-0849
TEST 7 SPIRAL 3
DATE: 9/13/76
TIME: 1008-1011
HEIGHT (M)
0
305
610
915
CONC. (PPT)
0
400
800
1200
40
80
120
200
600

Figure 106.

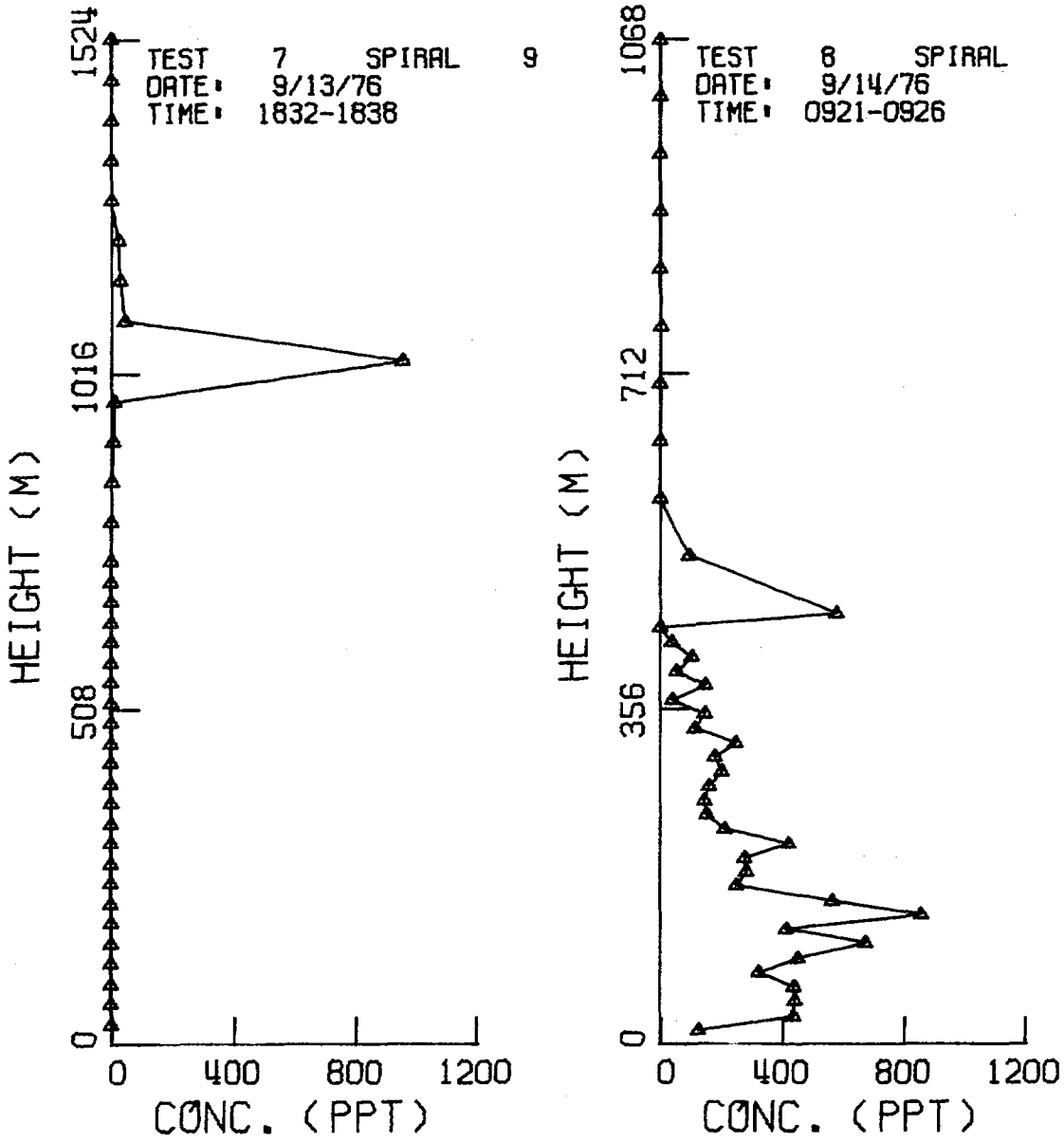

TEST 7 SPIRAL 9
DATE: 9/13/76
TIME: 1832-1838
HEIGHT (M)
0
508
1016
1524
0
400
800
1200
CONC. (PPT)
TEST 6 SPIRAL 1
DATE: 9/14/76
TIME: 0921-0926
HEIGHT (M)
0
356
712
1068
0
400
800
1200
CONC. (PPT)

Figure 107.

3.6 Automobile Traverse Best-fit Gaussian Curves

A best-fit Gaussian curve through the traverse data can be determined from the Gaussian equation:

$$C_f(y) = C_o \exp\left[-\tfrac{1}{2}\left(\frac{y - Y_o}{\sigma_y}\right)^2\right]$$

where $C_f(y)$ is the concentration as a function of distance along the traverse, C_o is the concentration at the plume centerline, Y_o is the distance along the traverse to the plume centerline, and σ_y is the crosswind standard deviation of the data. The function $C_f(y)$ represents a best-fit of the tracer data, $C(y)$, when the parameters are determined from

$$Y_o = \frac{\int_{-\infty}^{\infty} y\, C(y)\, dy}{\int_{-\infty}^{\infty} C(y)\, dy} \tag{1}$$

$$\sigma_y = \left[\frac{\int_{-\infty}^{\infty} y^2\, C(y)\, dy}{\int_{-\infty}^{\infty} C(y)\, dy} - Y_o^{\,2}\right]^{\frac{1}{2}} \tag{2}$$

and

$$C_o = \frac{\int_{-\infty}^{\infty} C(y)\, dy}{\sqrt{2\pi}\, \sigma_y} \tag{3}$$

The best-fit curves to the traverse tracer data are shown in the following figures. The integrals in (1), (2), and (3) were numerically integrated using Simpson's Rule (for details, see Appendix B of Volume I). Results of the best-fit procedure are given in Table 7.

The integration of the horizontal crosswind traverse data provides a means of calculating a value of the vertical crosswind standard

deviation, σ_z. If one assumes that the Gaussian plume model can be used to represent the data, then consideration of conservation of mass yields:

$$\int_{-\infty}^{\infty} C(y)\, dy \equiv C_{CWI} = \frac{Q}{\sqrt{2\pi}\,\sigma_z\, u} \left\{ \exp\left[-\tfrac{1}{2}\left(\frac{Z+H}{\sigma_z}\right)^2\right] + \exp\left[-\tfrac{1}{2}\left(\frac{Z-H}{\sigma_z}\right)^2\right] + \sum_{n=1}^{4} \left(\exp\left[-\tfrac{1}{2}\left(\frac{z+H-2nL}{\sigma_z}\right)^2\right] + \exp\left[-\tfrac{1}{2}\left(\frac{z-H-2nL}{\sigma_z}\right)^2\right] + \exp\left[-\tfrac{1}{2}\left(\frac{z-H+2nL}{\sigma_z}\right)^2\right] + \exp\left[-\tfrac{1}{2}\left(\frac{z+H+2nL}{\sigma_z}\right)^2\right] \right) \right\}$$

where C_{CWI} has been defined as the crosswind-integrated tracer concentration, and the summation terms have been used to represent reflection of the tracer from the top of the mixing layer, L. This equation can be solved for σ_z using a numerical iterative procedure. The value of σ_z thus obtained is an estimated number; the accuracy of the estimation is a function of the accuracy with which the average values of the wind speed and mixing height can be determined. The results of this analysis for the automobile traverse data are given in Table 7.

Figure 108.

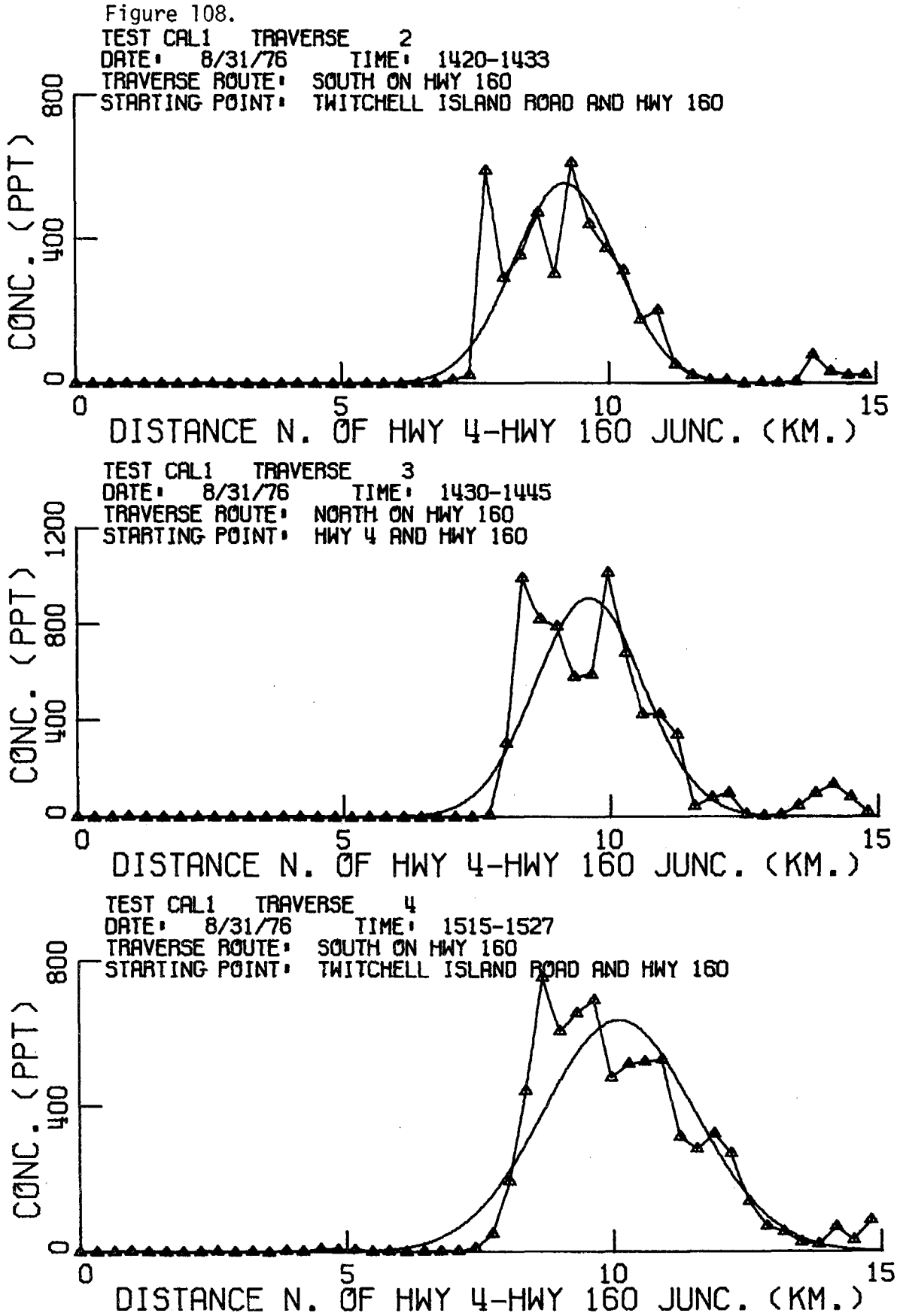

TEST CAL1 TRAVERSE 2
DATE: 8/31/76 TIME: 1420-1433
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: TWITCHELL ISLAND ROAD AND HWY 160
CONC. (PPT)
0
400
800
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL1 TRAVERSE 3
DATE: 8/31/76 TIME: 1430-1445
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: HWY 4 AND HWY 160
CONC. (PPT)
0
400
800
1200
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL1 TRAVERSE 4
DATE: 8/31/76 TIME: 1515-1527
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: TWITCHELL ISLAND ROAD AND HWY 160
CONC. (PPT)
0
400
800
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 110.

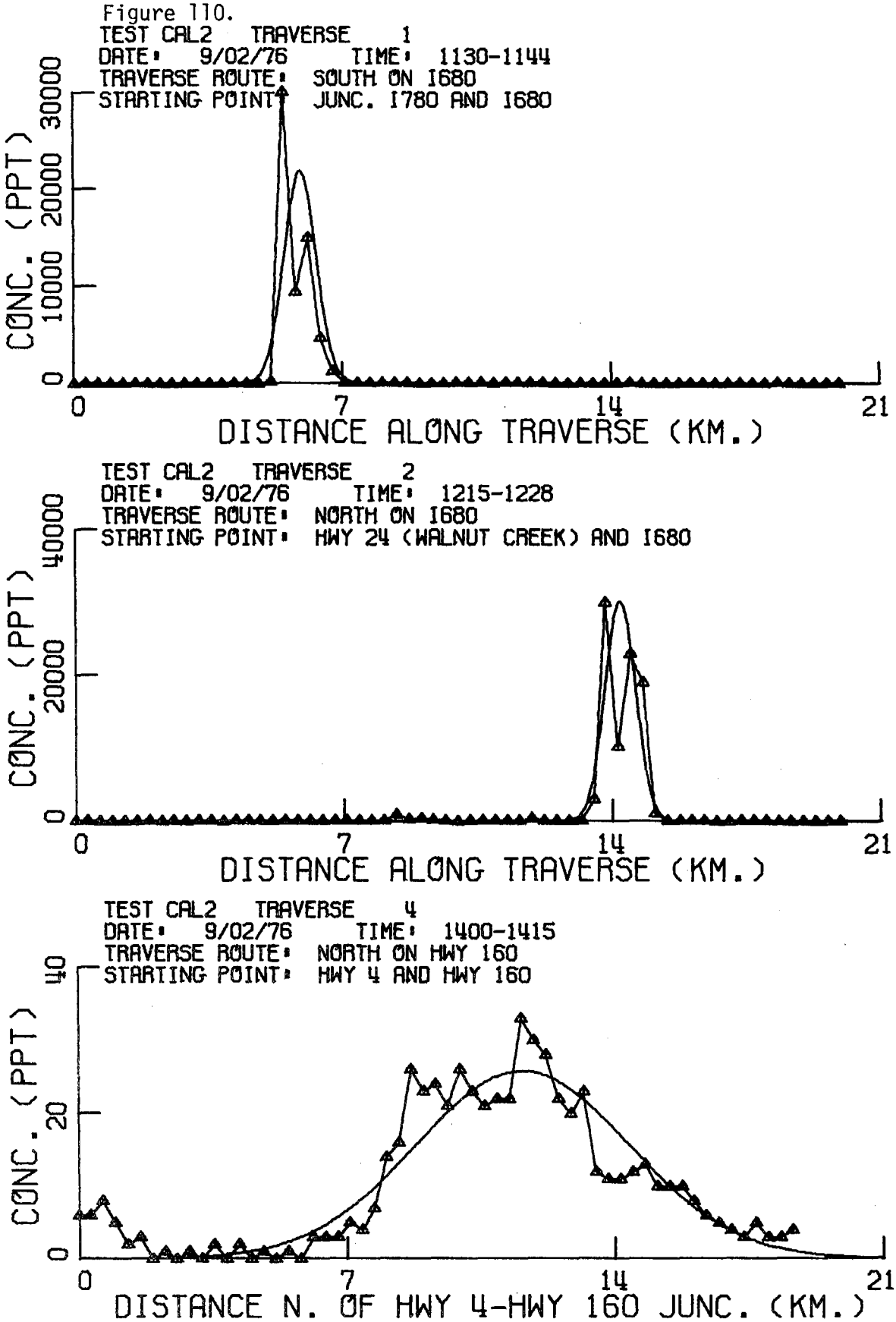

TEST CAL2 TRAVERSE 1
DATE: 9/02/76 TIME: 1130-1144
TRAVERSE ROUTE: SOUTH ON I680
STARTING POINT: JUNC. I780 AND I680
CONC. (PPT)
0
10000
20000
30000
0
7
14
21
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 2
DATE: 9/02/76 TIME: 1215-1228
TRAVERSE ROUTE: NORTH ON I680
STARTING POINT: HWY 24 (WALNUT CREEK) AND I680
CONC. (PPT)
0
20000
40000
0
7
14
21
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 4
DATE: 9/02/76 TIME: 1400-1415
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: HWY 4 AND HWY 160
CONC. (PPT)
0
20
40
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 111.

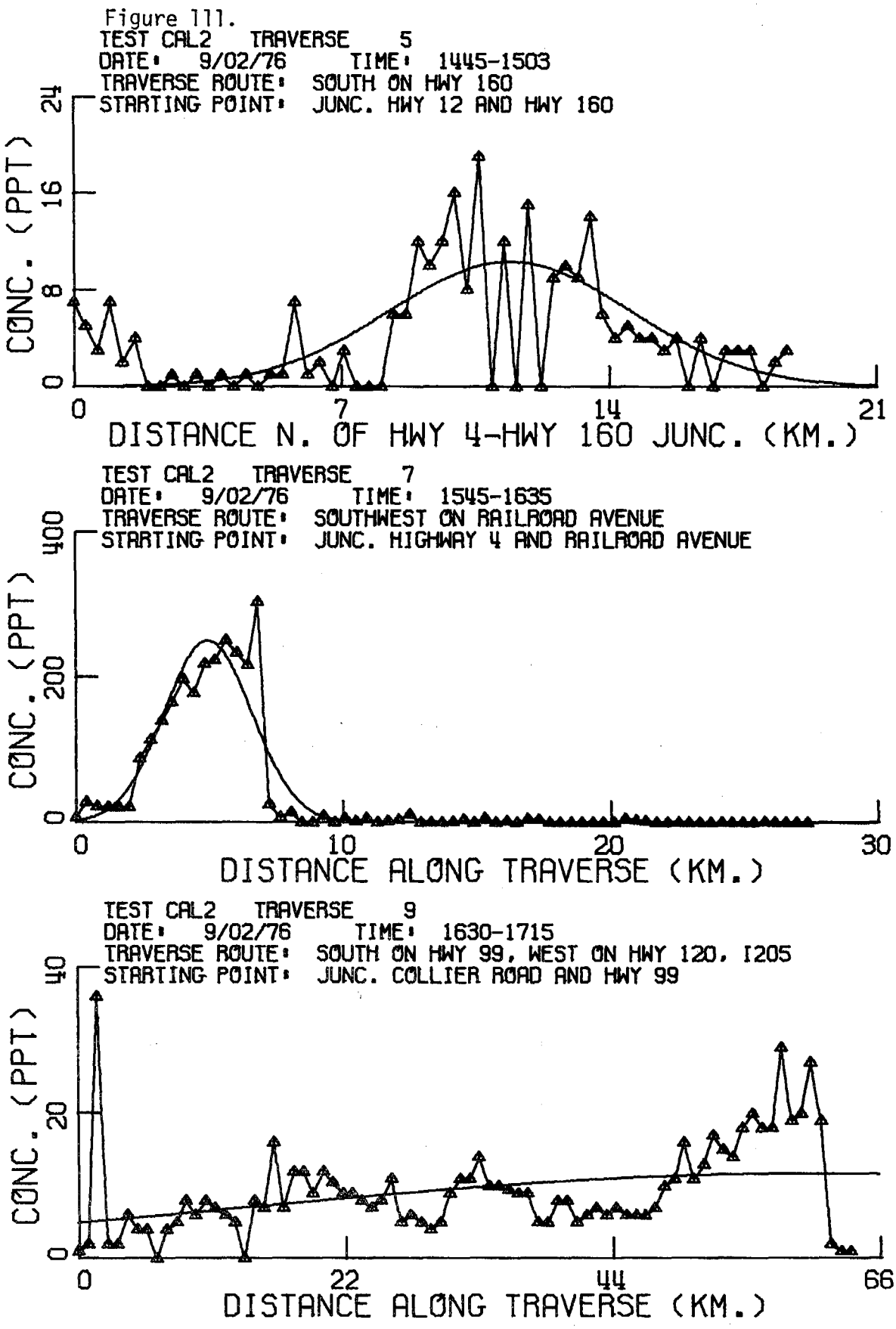
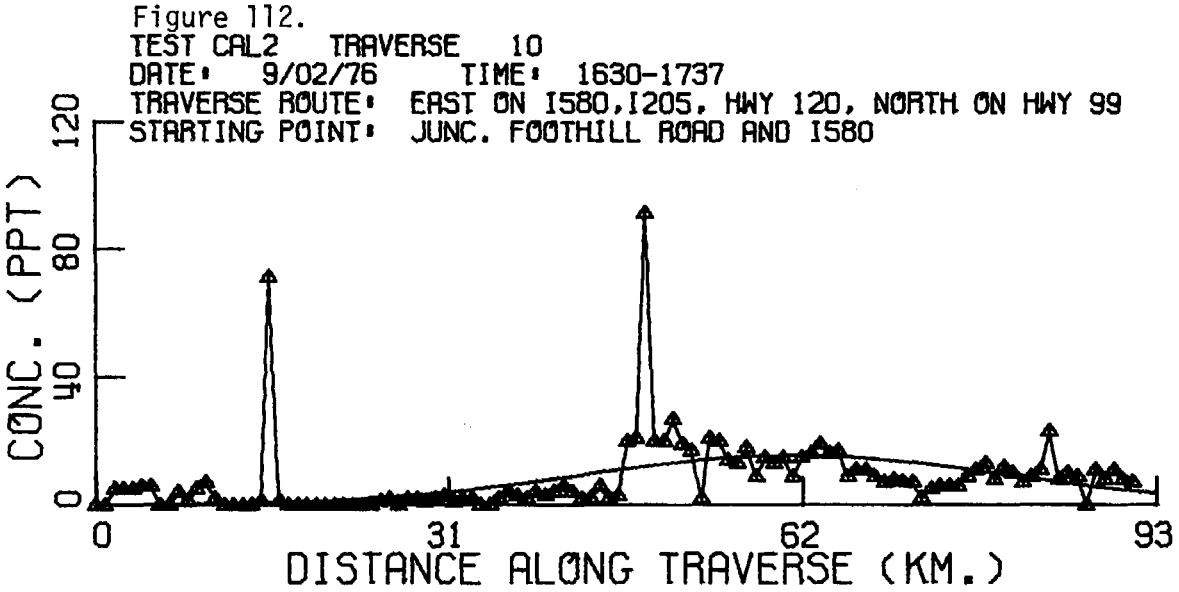

TEST CAL2 TRAVERSE 5
DATE: 9/02/76 TIME: 1445-1503
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CONC. (PPT)
0
8
16
24
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL2 TRAVERSE 7
DATE: 9/02/76 TIME: 1545-1635
TRAVERSE ROUTE: SOUTHWEST ON RAILROAD AVENUE
STARTING POINT: JUNC. HIGHWAY 4 AND RAILROAD AVENUE
CONC. (PPT)
0
200
400
0
10
20
30
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL2 TRAVERSE 9
DATE: 9/02/76 TIME: 1630-1715
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. COLLIER ROAD AND HWY 99
CONC. (PPT)
0
20
40
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 112.


TEST CAL2 TRAVERSE 10
DATE: 9/02/76 TIME: 1630-1737
TRAVERSE ROUTE: EAST ON I580,I205, HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. FOOTHILL ROAD AND I580
CONC. (PPT)
0
40
80
120
0
31
62
93
DISTANCE ALONG TRAVERSE (KM.)

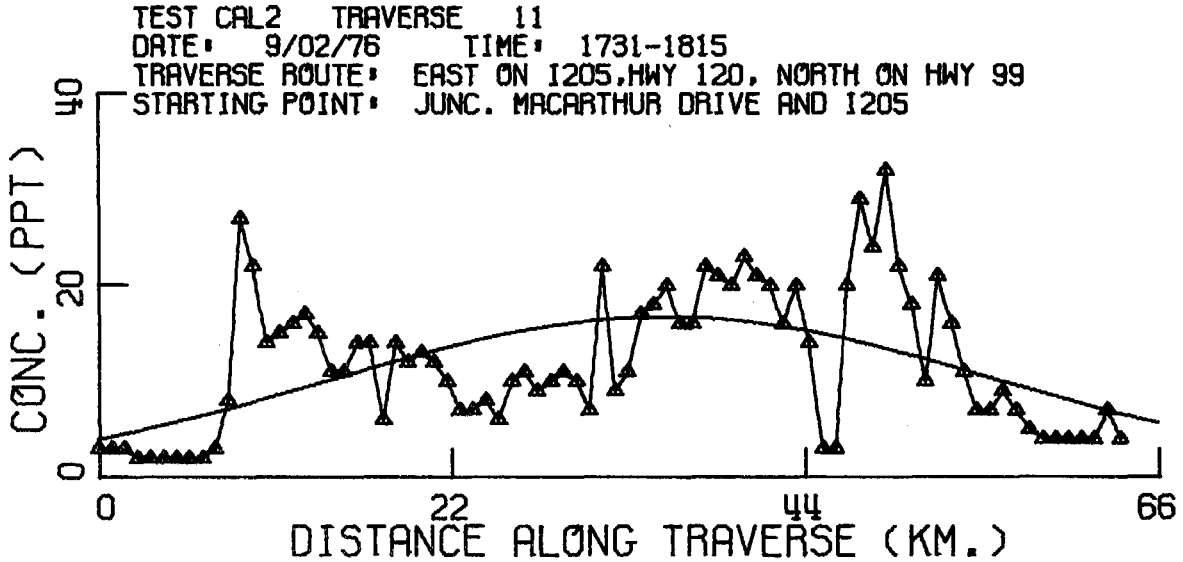

TEST CAL2 TRAVERSE 11
DATE: 9/02/76 TIME: 1731-1815
TRAVERSE ROUTE: EAST ON I205,HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. MACARTHUR DRIVE AND I205
CONC. (PPT)
0
20
40
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 113.

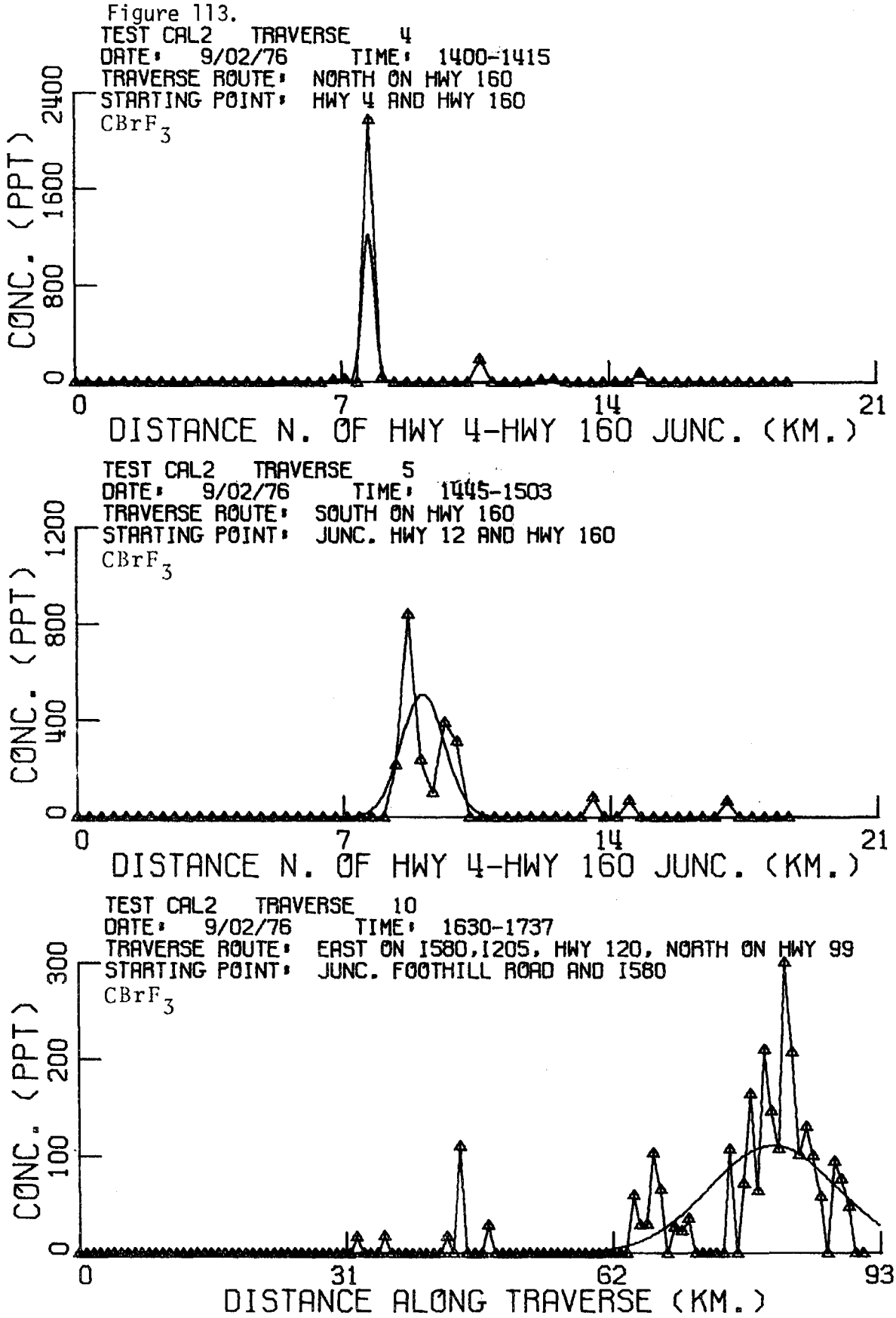

TEST CAL2 TRAVERSE 4
DATE: 9/02/76 TIME: 1400-1415
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: HWY 4 AND HWY 160
CBrF3
CONC. (PPT)
0
800
1600
2400
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL2 TRAVERSE 5
DATE: 9/02/76 TIME: 1445-1503
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CBrF3
CONC. (PPT)
0
400
800
1200
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL2 TRAVERSE 10
DATE: 9/02/76 TIME: 1630-1737
TRAVERSE ROUTE: EAST ON I580,I205, HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. FOOTHILL ROAD AND I580
CBrF3
CONC. (PPT)
0
100
200
300
0
31
62
93
DISTANCE ALONG TRAVERSE (KM.)

Figure 114.

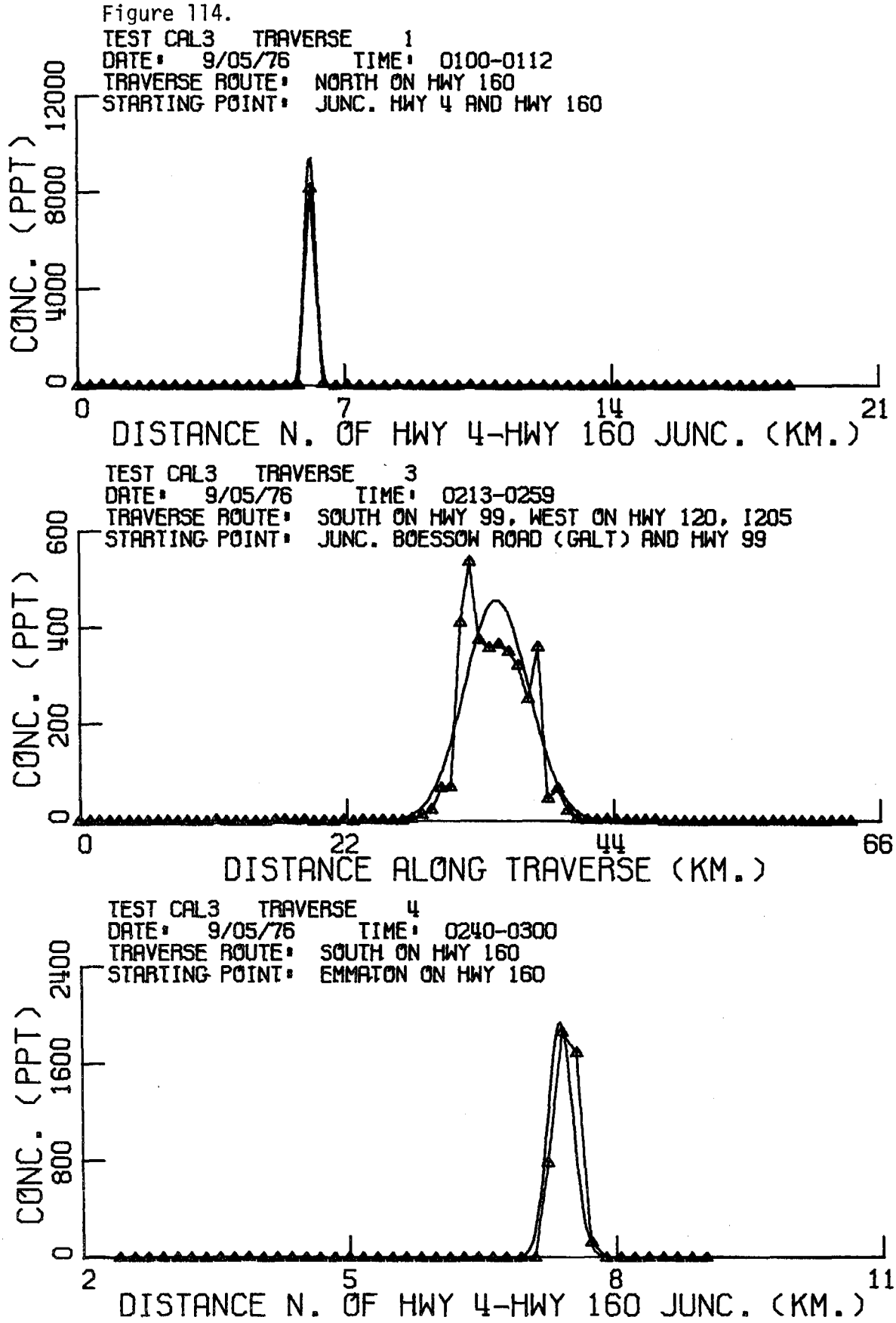

TEST CAL3 TRAVERSE 1
DATE: 9/05/76 TIME: 0100-0112
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: JUNC. HWY 4 AND HWY 160
CONC. (PPT)
0
4000
8000
12000
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 3
DATE: 9/05/76 TIME: 0213-0259
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. BOESSOW ROAD (GALT) AND HWY 99
CONC. (PPT)
0
200
400
600
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL3 TRAVERSE 4
DATE: 9/05/76 TIME: 0240-0300
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: EMMATON ON HWY 160
CONC. (PPT)
0
800
1600
2400
2
5
8
11
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 115.

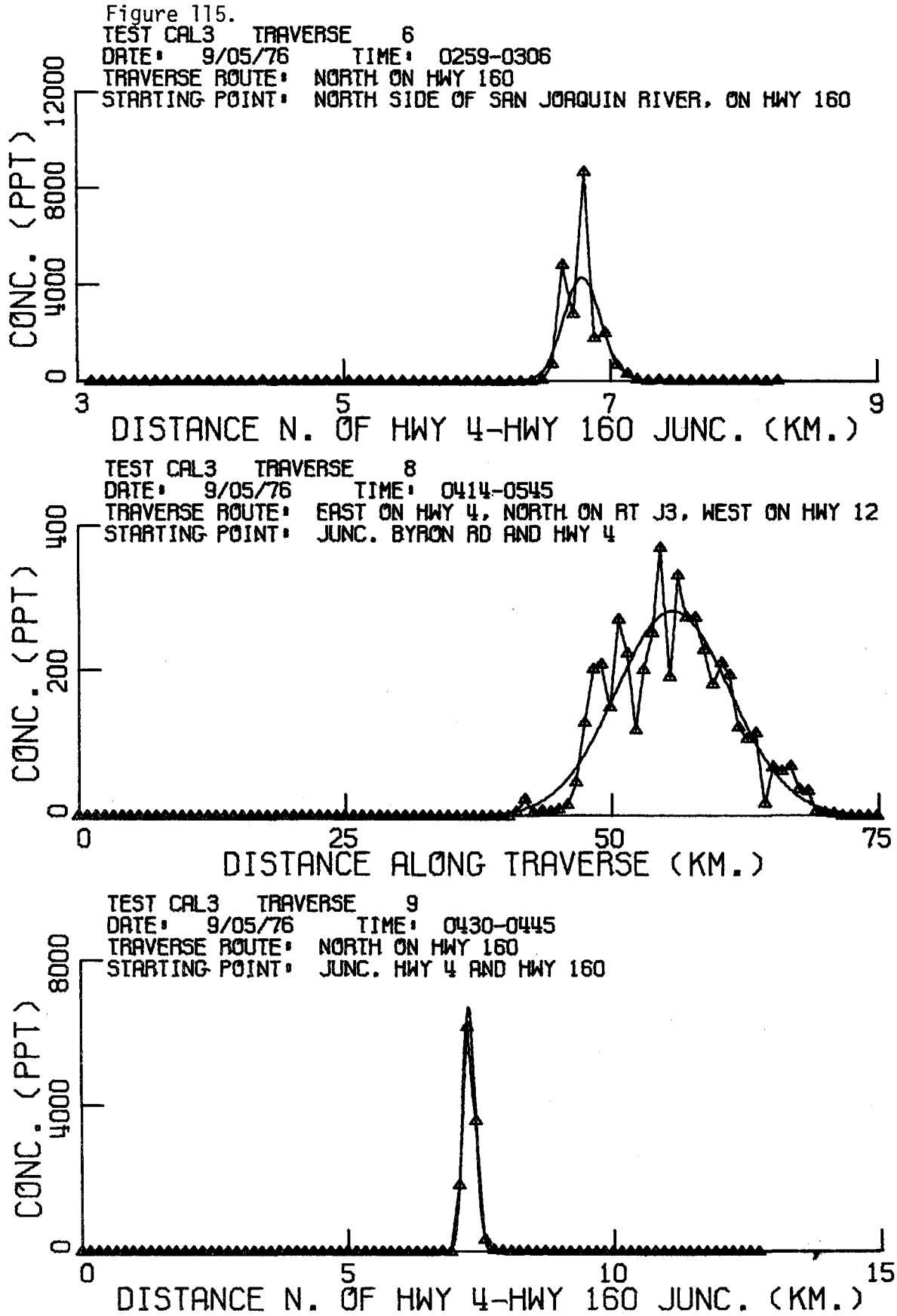

TEST CAL3 TRAVERSE 6
DATE: 9/05/76 TIME: 0259-0306
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE OF SAN JOAQUIN RIVER, ON HWY 160
CONC. (PPT)
0
4000
8000
12000
3
5
7
9
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 8
DATE: 9/05/76 TIME: 0414-0545
TRAVERSE ROUTE: EAST ON HWY 4, NORTH ON RT J3, WEST ON HWY 12
STARTING POINT: JUNC. BYRON RD AND HWY 4
CONC. (PPT)
0
200
400
0
25
50
75
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL3 TRAVERSE 9
DATE: 9/05/76 TIME: 0430-0445
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: JUNC. HWY 4 AND HWY 160
CONC. (PPT)
0
4000
8000
0
5
10
15
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 116.

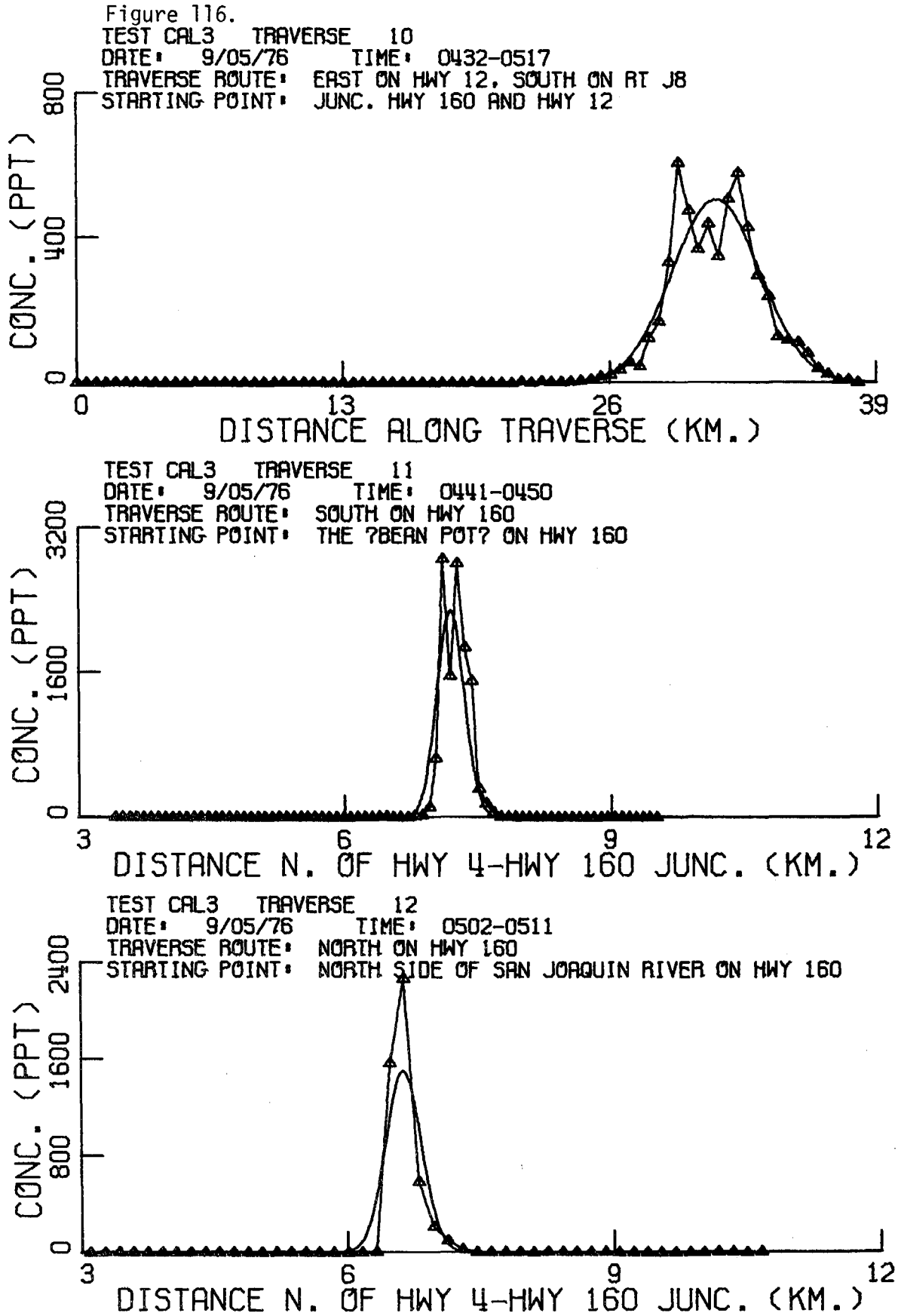

TEST CAL3 TRAVERSE 10
DATE: 9/05/76 TIME: 0432-0517
TRAVERSE ROUTE: EAST ON HWY 12, SOUTH ON RT J8
STARTING POINT: JUNC. HWY 160 AND HWY 12
CONC. (PPT)
0
400
800
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL3 TRAVERSE 11
DATE: 9/05/76 TIME: 0441-0450
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: THE ?BEAN POT? ON HWY 160
CONC. (PPT)
0
1600
3200
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL3 TRAVERSE 12
DATE: 9/05/76 TIME: 0502-0511
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE OF SAN JOAQUIN RIVER ON HWY 160
CONC. (PPT)
0
800
1600
2400
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 117.

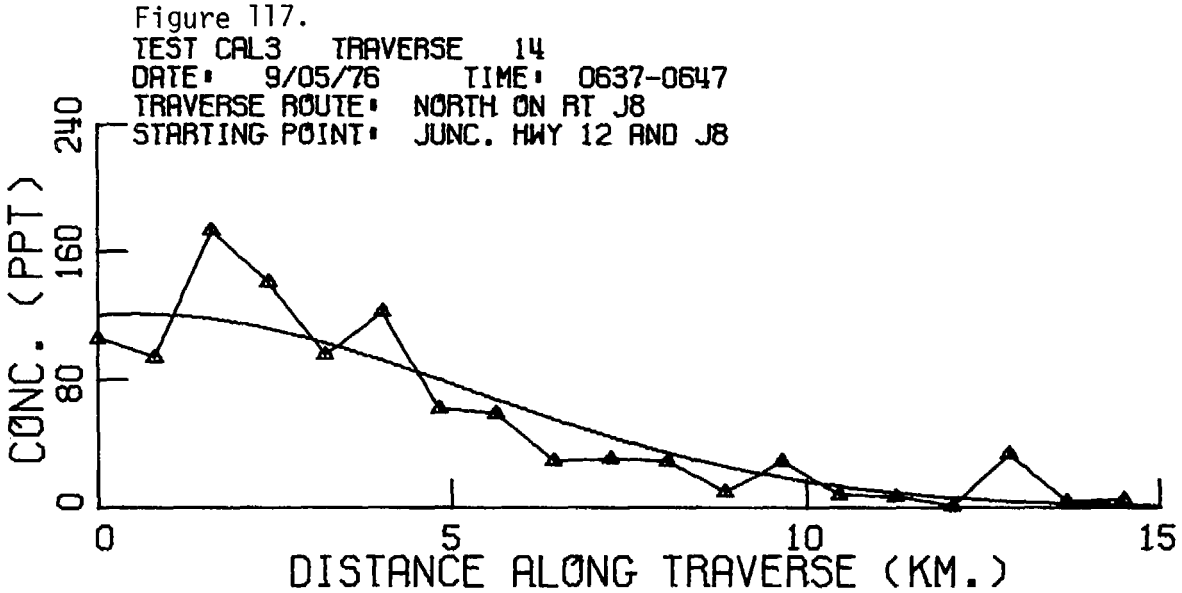

TEST CAL3 TRAVERSE 14
DATE: 9/05/76 TIME: 0637-0647
TRAVERSE ROUTE: NORTH ON RT J8
STARTING POINT: JUNC. HWY 12 AND J8
CONC. (PPT)
0
80
160
240
0
5
10
15
DISTANCE ALONG TRAVERSE (KM.)

Figure 118.

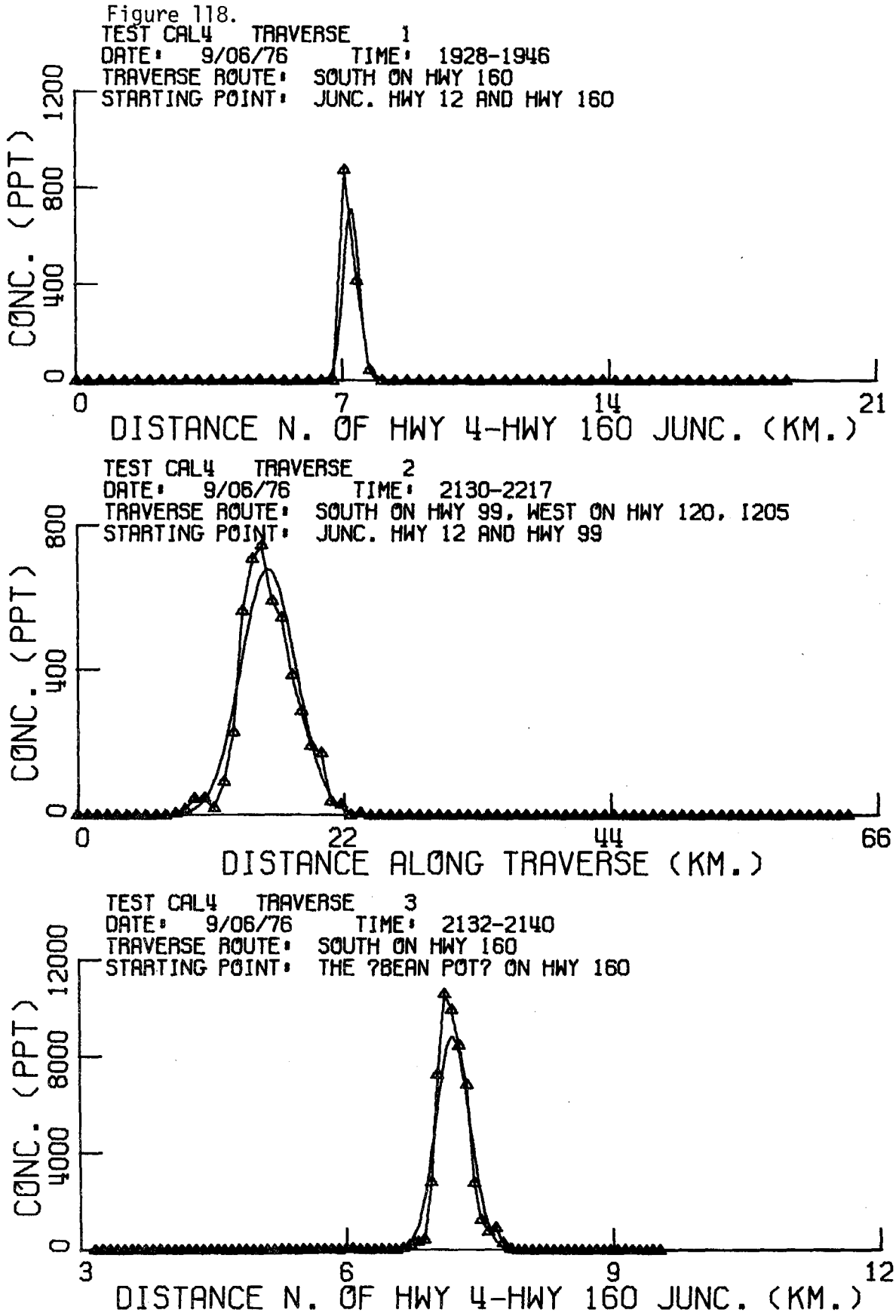

TEST CAL4 TRAVERSE 1
DATE: 9/06/76 TIME: 1928-1946
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CONC. (PPT)
0
400
800
1200
0
7
14
21
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL4 TRAVERSE 2
DATE: 9/06/76 TIME: 2130-2217
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 AND HWY 99
CONC. (PPT)
0
400
800
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL4 TRAVERSE 3
DATE: 9/06/76 TIME: 2132-2140
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: THE ?BEAN POT? ON HWY 160
CONC. (PPT)
0
4000
8000
12000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 119.

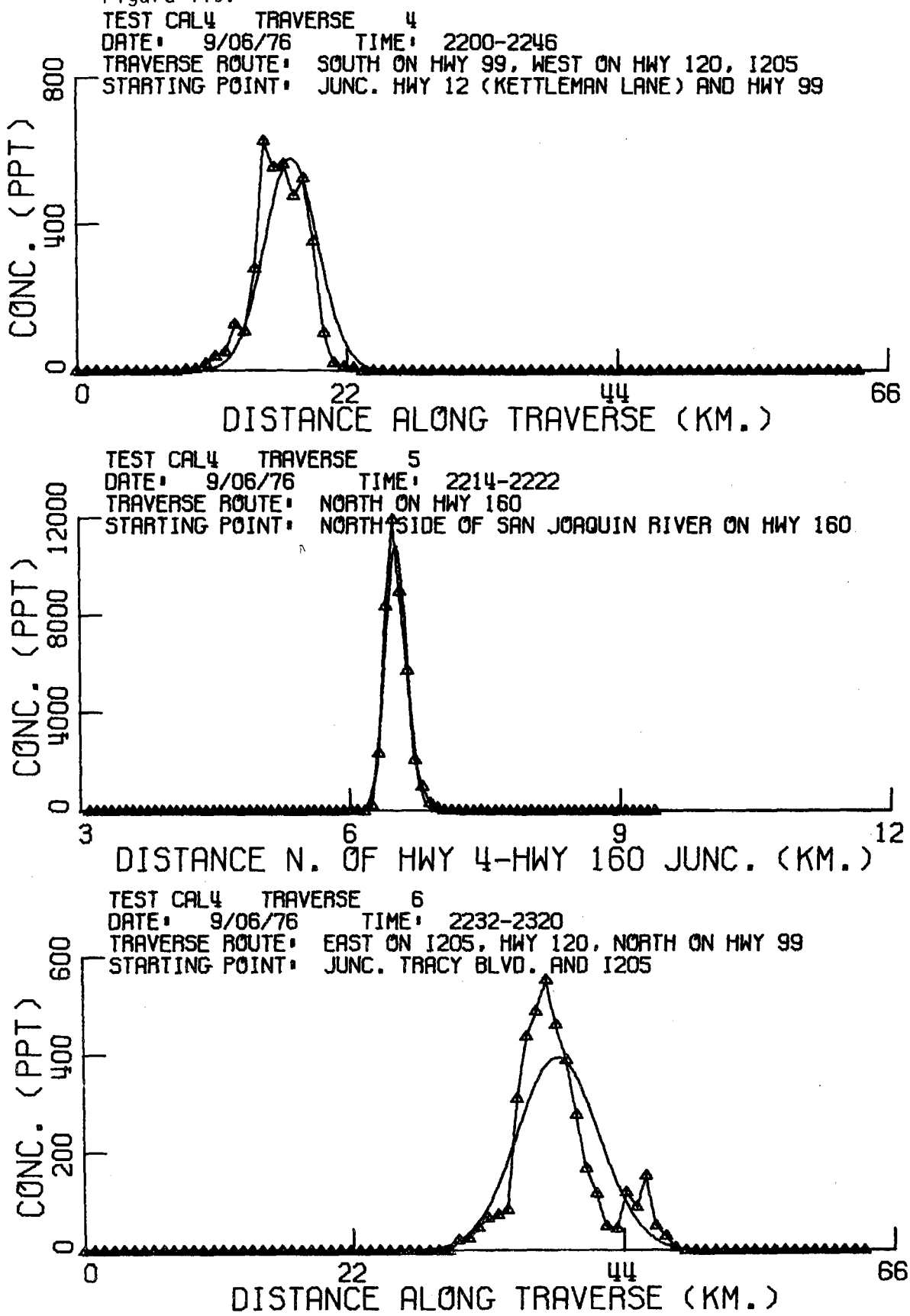

TEST CAL4 TRAVERSE 4
DATE: 9/06/76 TIME: 2200-2246
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 (KETTLEMAN LANE) AND HWY 99
CONC. (PPT)
0
400
800
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL4 TRAVERSE 5
DATE: 9/06/76 TIME: 2214-2222
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE OF SAN JOAQUIN RIVER ON HWY 160
CONC. (PPT)
0
4000
8000
12000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL4 TRAVERSE 6
DATE: 9/06/76 TIME: 2232-2320
TRAVERSE ROUTE: EAST ON I205, HWY 120, NORTH ON HWY 99
STARTING POINT: JUNC. TRACY BLVD. AND I205
CONC. (PPT)
0
200
400
600
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 120.
TEST CAL4 TRAVERSE 7
DATE: 9/06/76 TIME: 2315-2400
TRAVERSE ROUTE: EAST ON I205, HWY 120, NORTH ON HWY 99
STARTING POINT: 1.4 MI. E. OF JUNC. PATTERSON PASS RD. AND I205

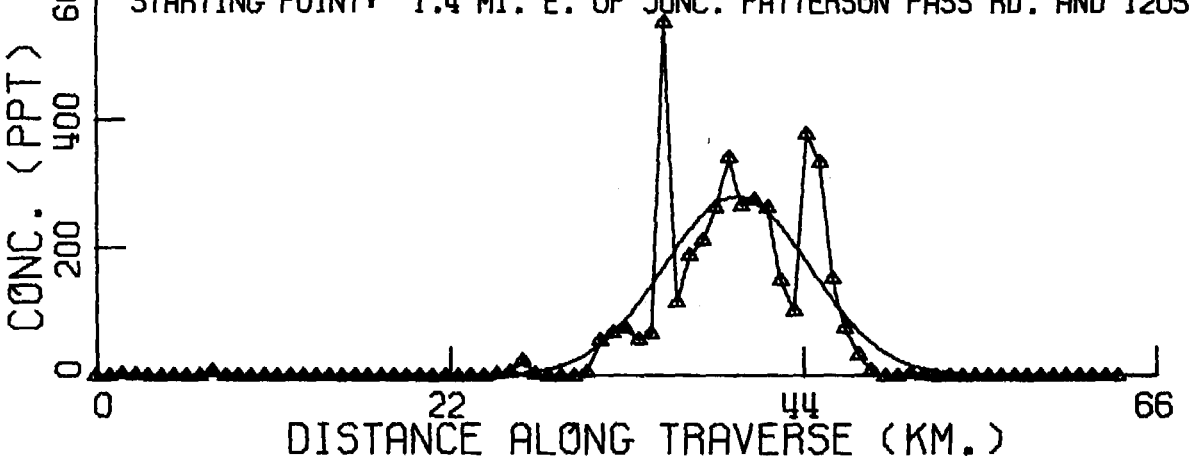


Figure 121.

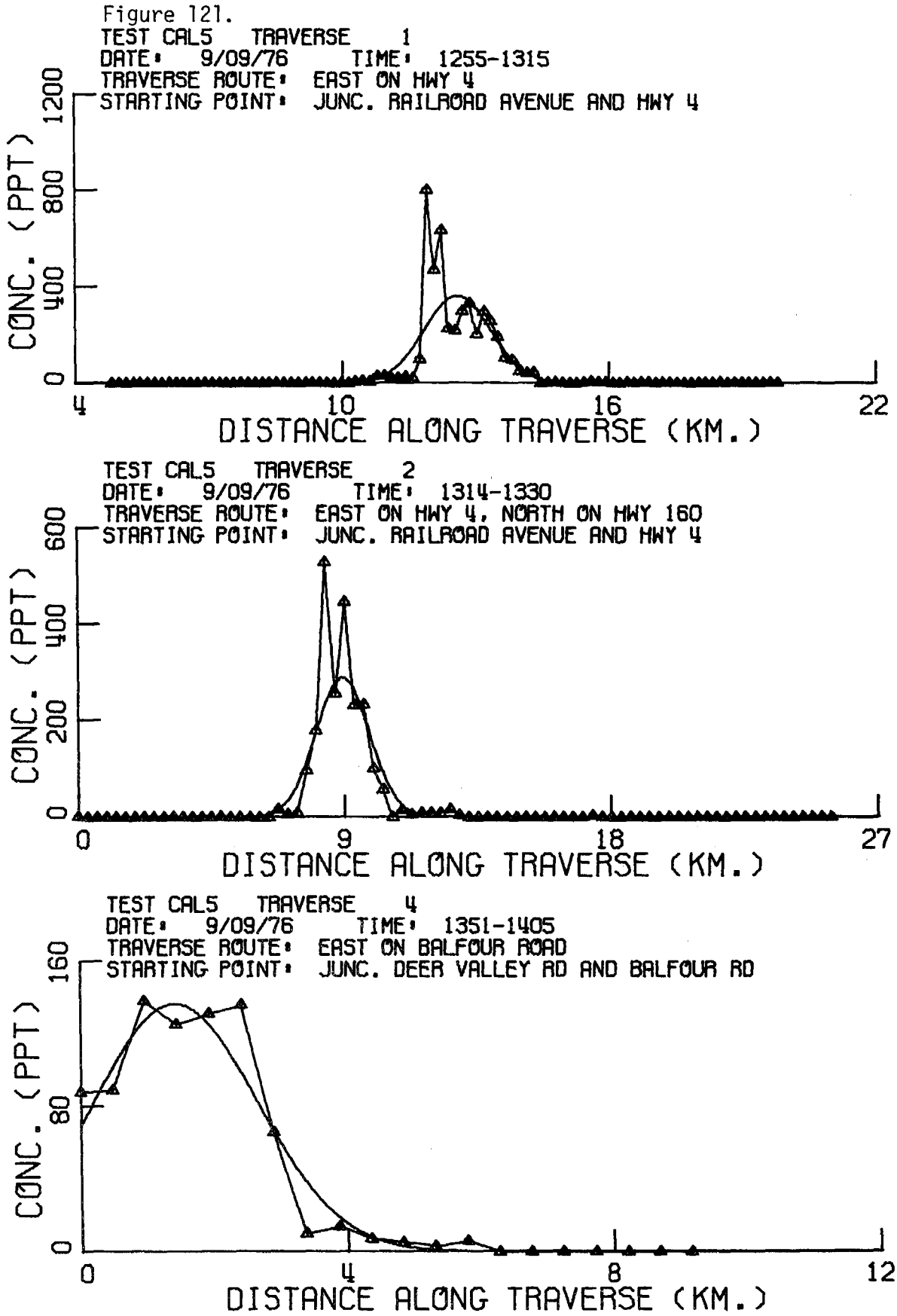

TEST CAL5 TRAVERSE 1
DATE: 9/09/76 TIME: 1255-1315
TRAVERSE ROUTE: EAST ON HWY 4
STARTING POINT: JUNC. RAILROAD AVENUE AND HWY 4
CONC. (PPT)
0
400
800
1200
4
10
16
22
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 2
DATE: 9/09/76 TIME: 1314-1330
TRAVERSE ROUTE: EAST ON HWY 4, NORTH ON HWY 160
STARTING POINT: JUNC. RAILROAD AVENUE AND HWY 4
CONC. (PPT)
0
200
400
600
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 4
DATE: 9/09/76 TIME: 1351-1405
TRAVERSE ROUTE: EAST ON BALFOUR ROAD
STARTING POINT: JUNC. DEER VALLEY RD AND BALFOUR RD
CONC. (PPT)
0
80
160
0
4
8
12
DISTANCE ALONG TRAVERSE (KM.)

Figure 122.

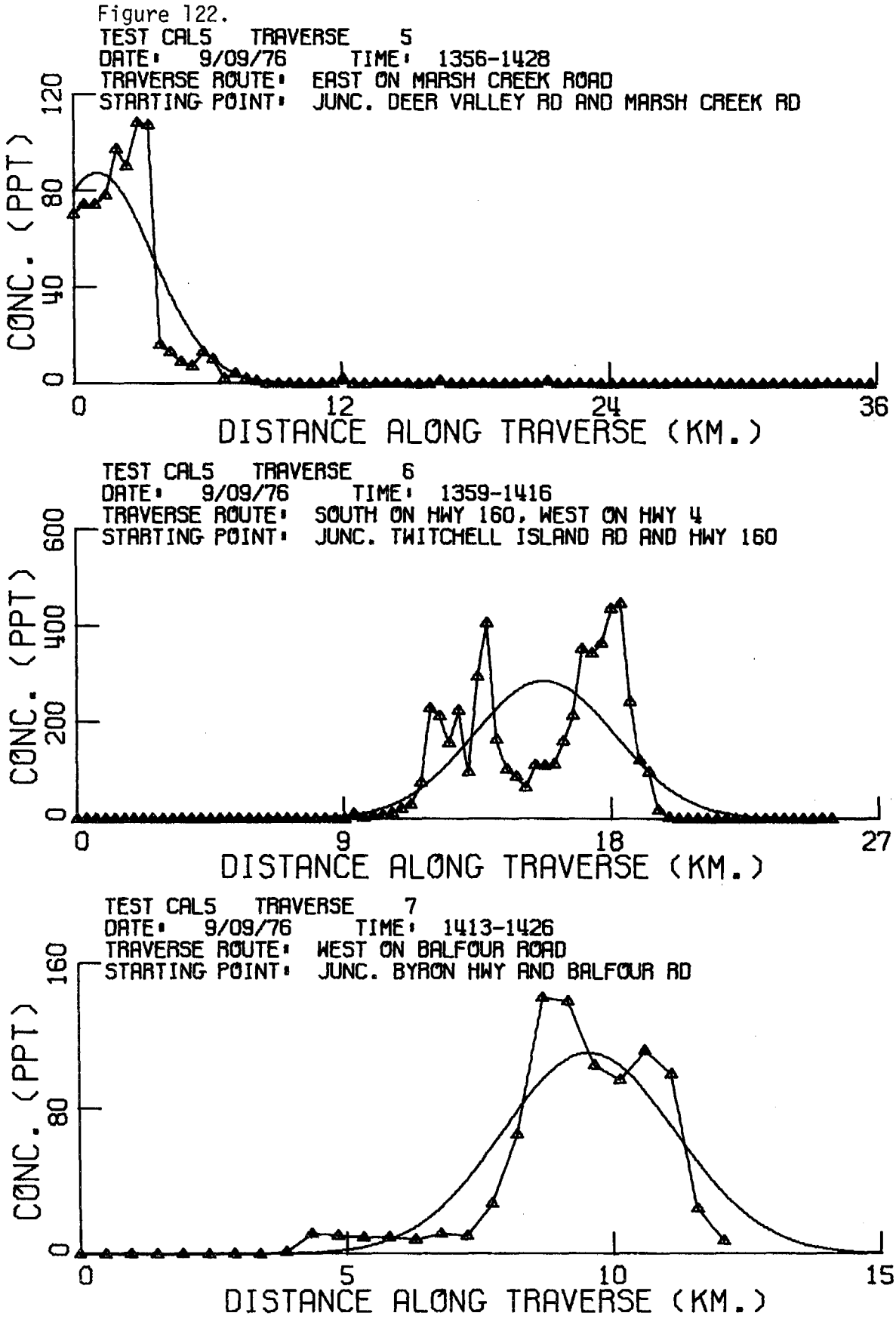

TEST CAL5 TRAVERSE 5
DATE: 9/09/76 TIME: 1356-1428
TRAVERSE ROUTE: EAST ON MARSH CREEK ROAD
STARTING POINT: JUNC. DEER VALLEY RD AND MARSH CREEK RD
CONC. (PPT)
0
40
80
120
0
12
24
36
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 6
DATE: 9/09/76 TIME: 1359-1416
TRAVERSE ROUTE: SOUTH ON HWY 160, WEST ON HWY 4
STARTING POINT: JUNC. TWITCHELL ISLAND RD AND HWY 160
CONC. (PPT)
0
200
400
600
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL5 TRAVERSE 7
DATE: 9/09/76 TIME: 1413-1426
TRAVERSE ROUTE: WEST ON BALFOUR ROAD
STARTING POINT: JUNC. BYRON HWY AND BALFOUR RD
CONC. (PPT)
0
80
160
0
5
10
15
DISTANCE ALONG TRAVERSE (KM.)

Figure 123.

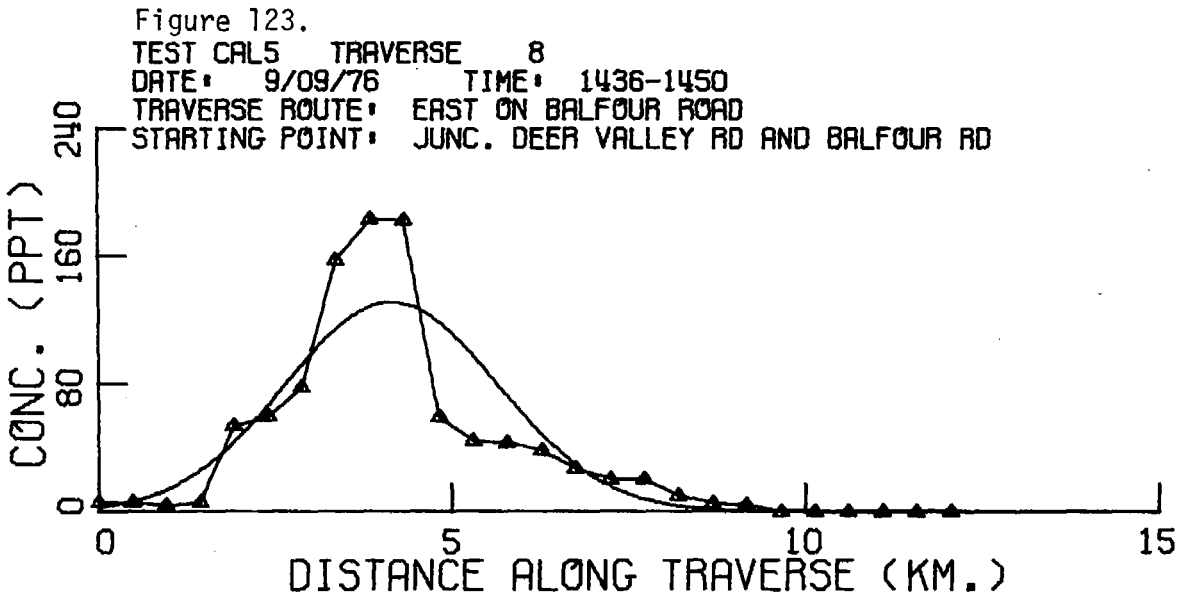

TEST CAL5 TRAVERSE 8
DATE: 9/09/76 TIME: 1436-1450
TRAVERSE ROUTE: EAST ON BALFOUR ROAD
STARTING POINT: JUNC. DEER VALLEY RD AND BALFOUR RD
CONC. (PPT)
0
80
160
240
0
5
10
15
DISTANCE ALONG TRAVERSE (KM.)

Figure 124.

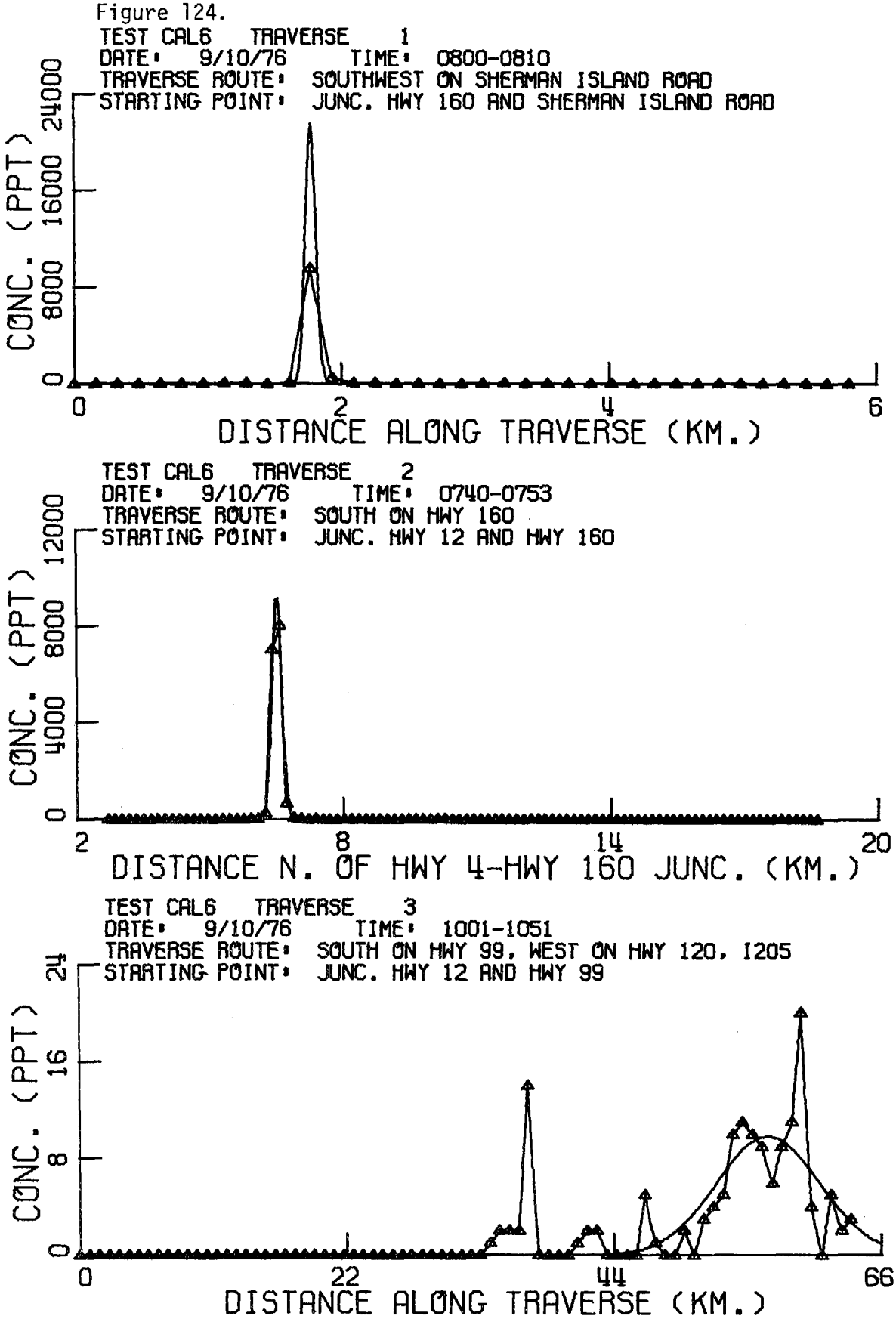

TEST CAL6 TRAVERSE 1
DATE: 9/10/76 TIME: 0800-0810
TRAVERSE ROUTE: SOUTHWEST ON SHERMAN ISLAND ROAD
STARTING POINT: JUNC. HWY 160 AND SHERMAN ISLAND ROAD
CONC. (PPT)
0
8000
16000
24000
0
2
4
6
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL6 TRAVERSE 2
DATE: 9/10/76 TIME: 0740-0753
TRAVERSE ROUTE: SOUTH ON HWY 160
STARTING POINT: JUNC. HWY 12 AND HWY 160
CONC. (PPT)
0
4000
8000
12000
2
8
14
20
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)
TEST CAL6 TRAVERSE 3
DATE: 9/10/76 TIME: 1001-1051
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 AND HWY 99
CONC. (PPT)
0
8
16
24
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 125.

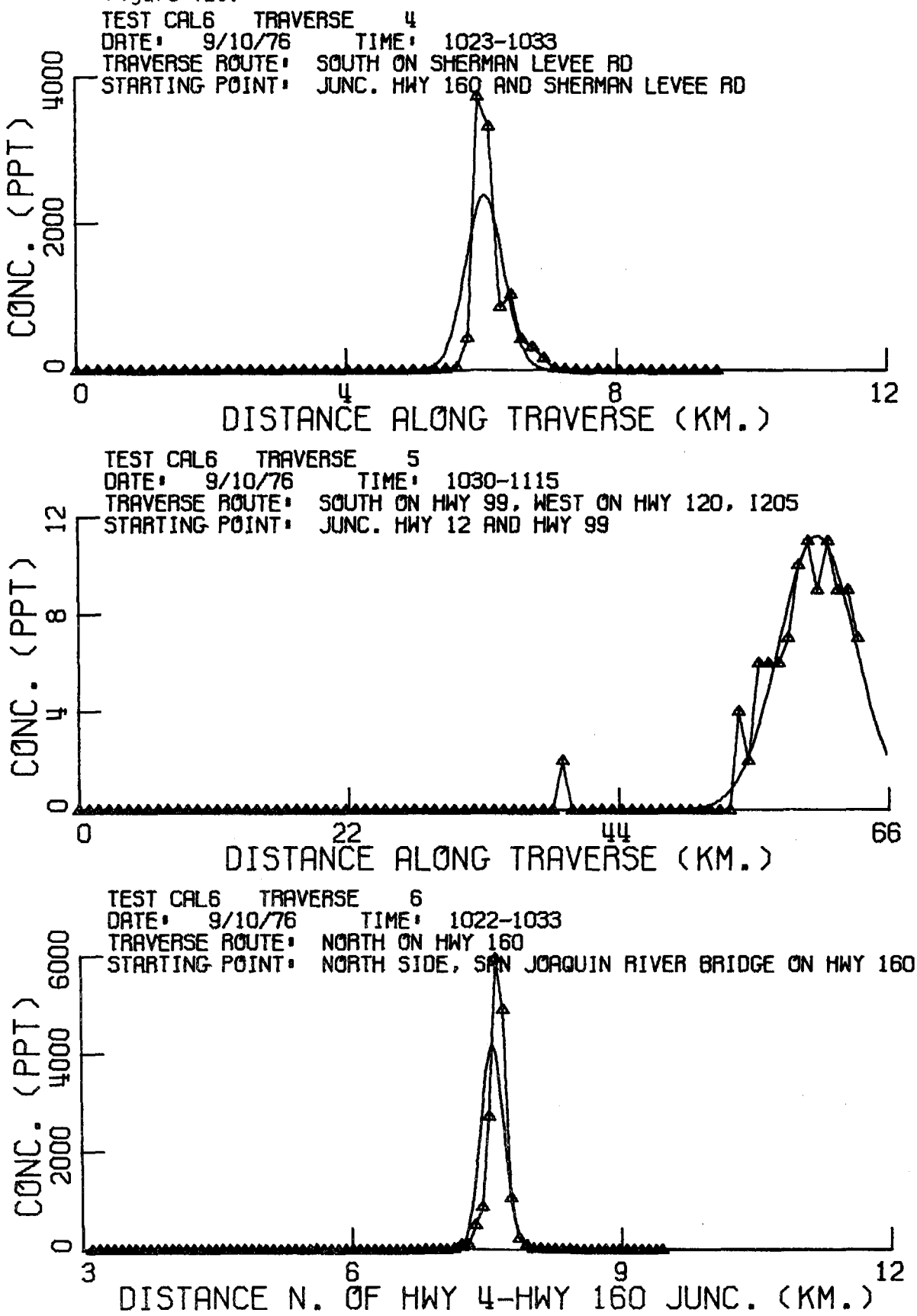
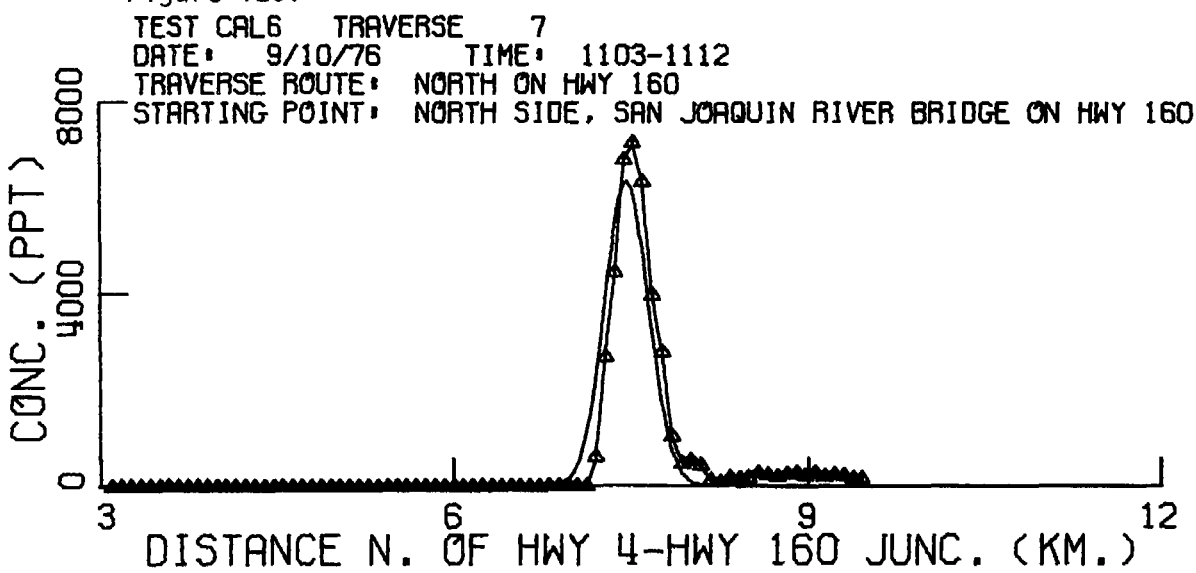

TEST CAL6 TRAVERSE 4
DATE: 9/10/76 TIME: 1023-1033
TRAVERSE ROUTE: SOUTH ON SHERMAN LEVEE RD
STARTING POINT: JUNC. HWY 160 AND SHERMAN LEVEE RD
CONC. (PPT)
0
2000
4000
0
4
8
12
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL6 TRAVERSE 5
DATE: 9/10/76 TIME: 1030-1115
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205
STARTING POINT: JUNC. HWY 12 AND HWY 99
CONC. (PPT)
0
4
8
12
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL6 TRAVERSE 6
DATE: 9/10/76 TIME: 1022-1033
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE, SAN JOAQUIN RIVER BRIDGE ON HWY 160
CONC. (PPT)
0
2000
4000
6000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

Figure 126.


TEST CAL6 TRAVERSE 7
DATE: 9/10/76 TIME: 1103-1112
TRAVERSE ROUTE: NORTH ON HWY 160
STARTING POINT: NORTH SIDE, SAN JOAQUIN RIVER BRIDGE ON HWY 160
CONC. (PPT)
0
4000
8000
3
6
9
12
DISTANCE N. OF HWY 4-HWY 160 JUNC. (KM.)

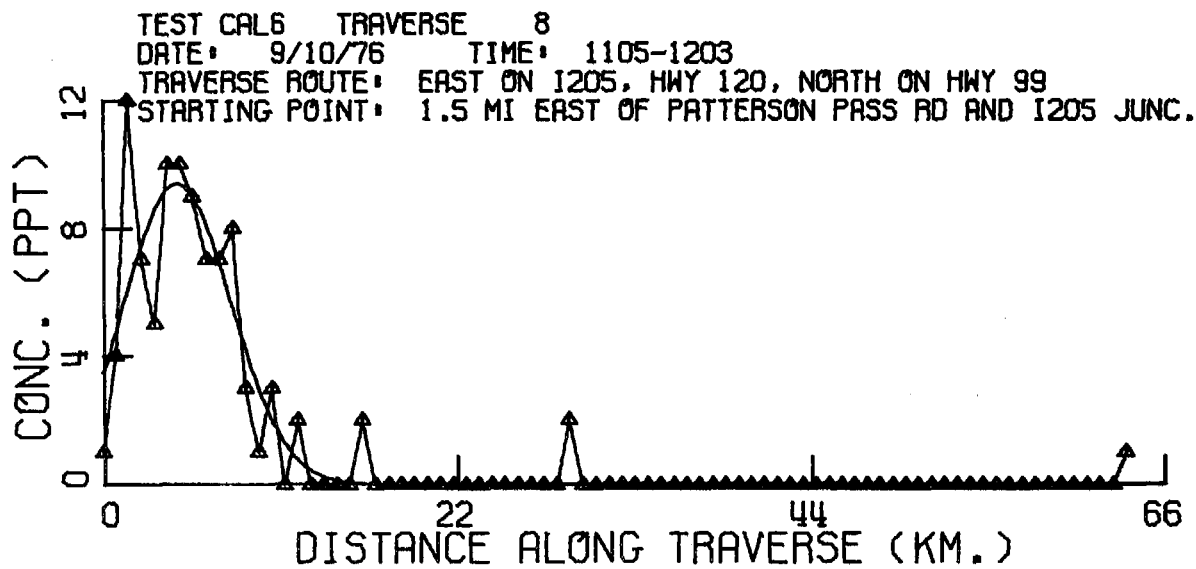

TEST CAL6 TRAVERSE 8
DATE: 9/10/76 TIME: 1105-1203
TRAVERSE ROUTE: EAST ON I205, HWY 120, NORTH ON HWY 99
STARTING POINT: 1.5 MI EAST OF PATTERSON PASS RD AND I205 JUNC.
CONC. (PPT)
0
4
8
12
0
22
44
66
DISTANCE ALONG TRAVERSE (KM.)

Figure 127.

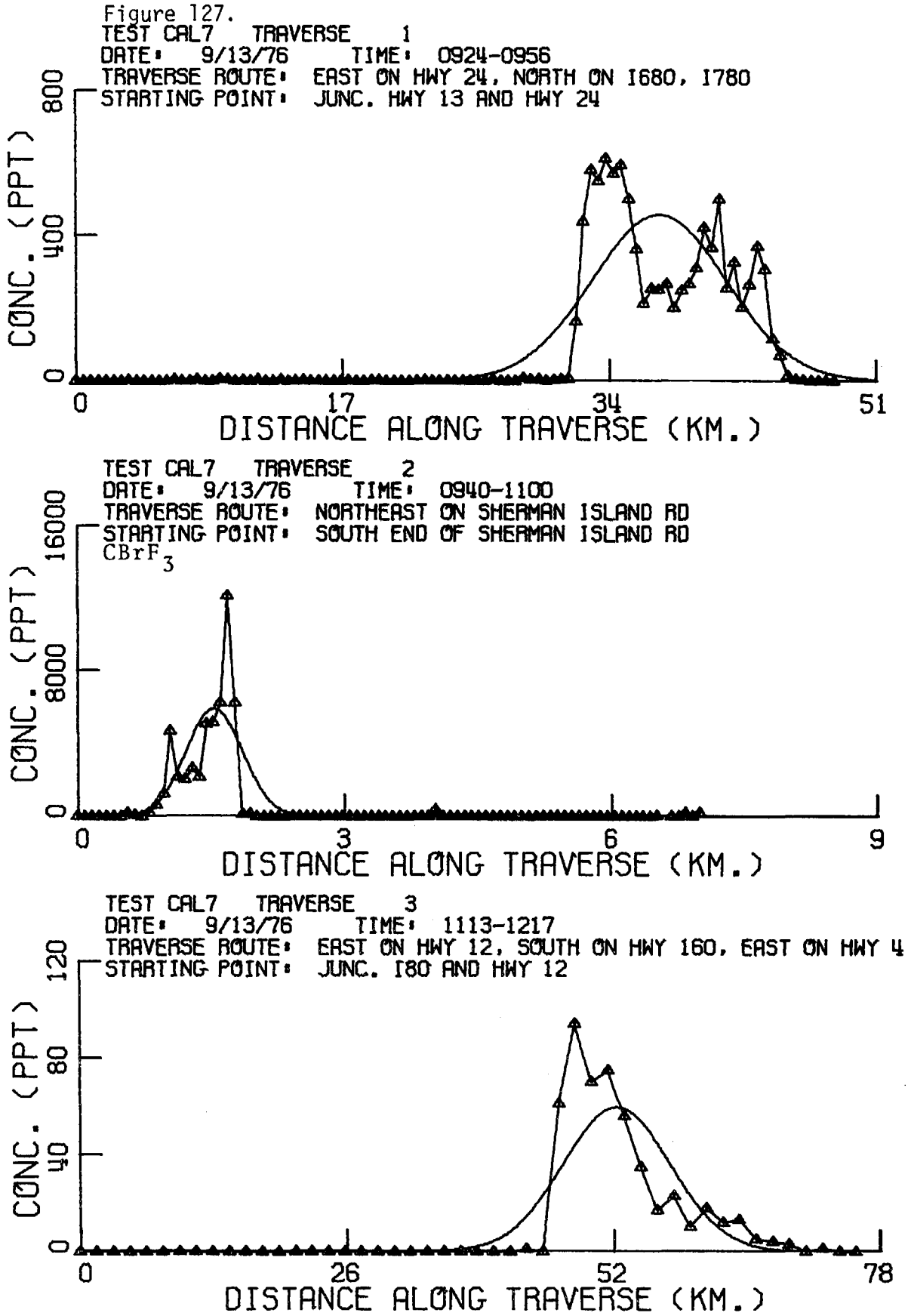

TEST CAL7 TRAVERSE 1
DATE: 9/13/76 TIME: 0924-0956
TRAVERSE ROUTE: EAST ON HWY 24, NORTH ON I680, I780
STARTING POINT: JUNC. HWY 13 AND HWY 24
CONC. (PPT)
0
400
800
0
17
34
51
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 2
DATE: 9/13/76 TIME: 0940-1100
TRAVERSE ROUTE: NORTHEAST ON SHERMAN ISLAND RD
STARTING POINT: SOUTH END OF SHERMAN ISLAND RD
CBrF3
CONC. (PPT)
0
8000
16000
0
3
6
9
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 3
DATE: 9/13/76 TIME: 1113-1217
TRAVERSE ROUTE: EAST ON HWY 12, SOUTH ON HWY 160, EAST ON HWY 4
STARTING POINT: JUNC. I80 AND HWY 12
CONC. (PPT)
0
40
80
120
0
26
52
78
DISTANCE ALONG TRAVERSE (KM.)

Figure 128.

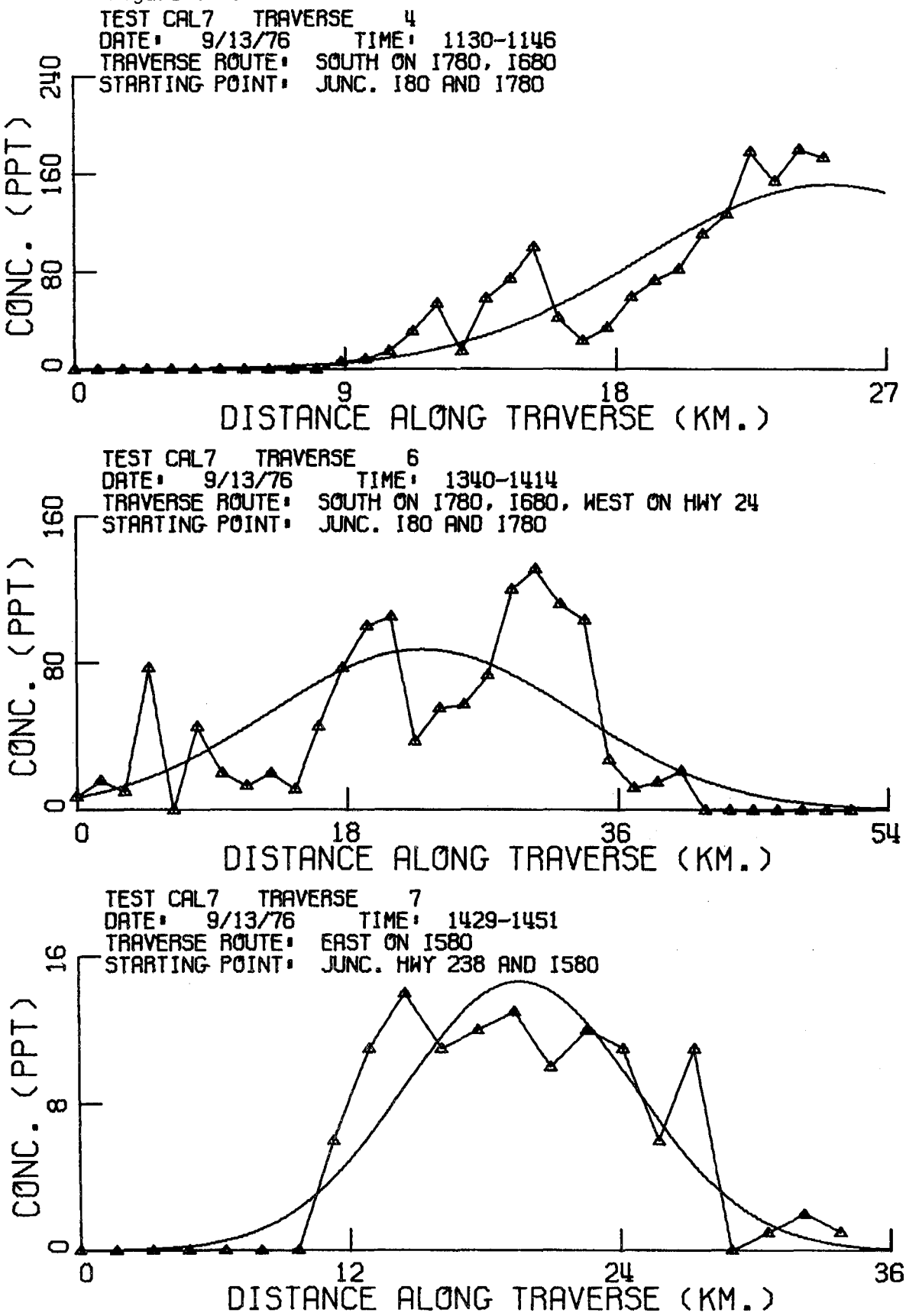
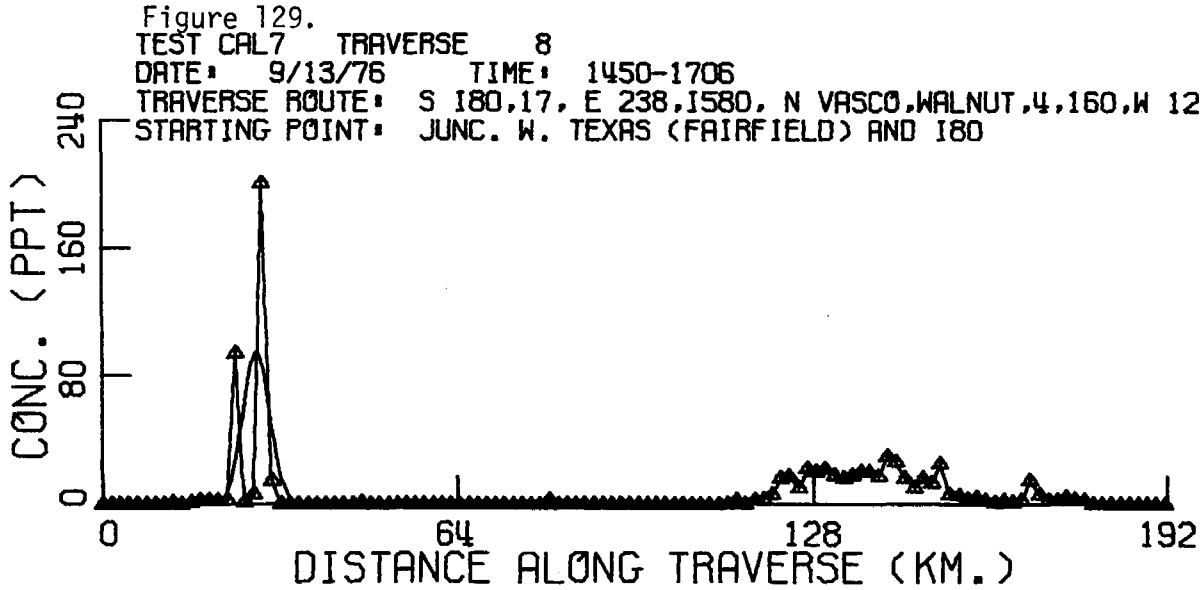
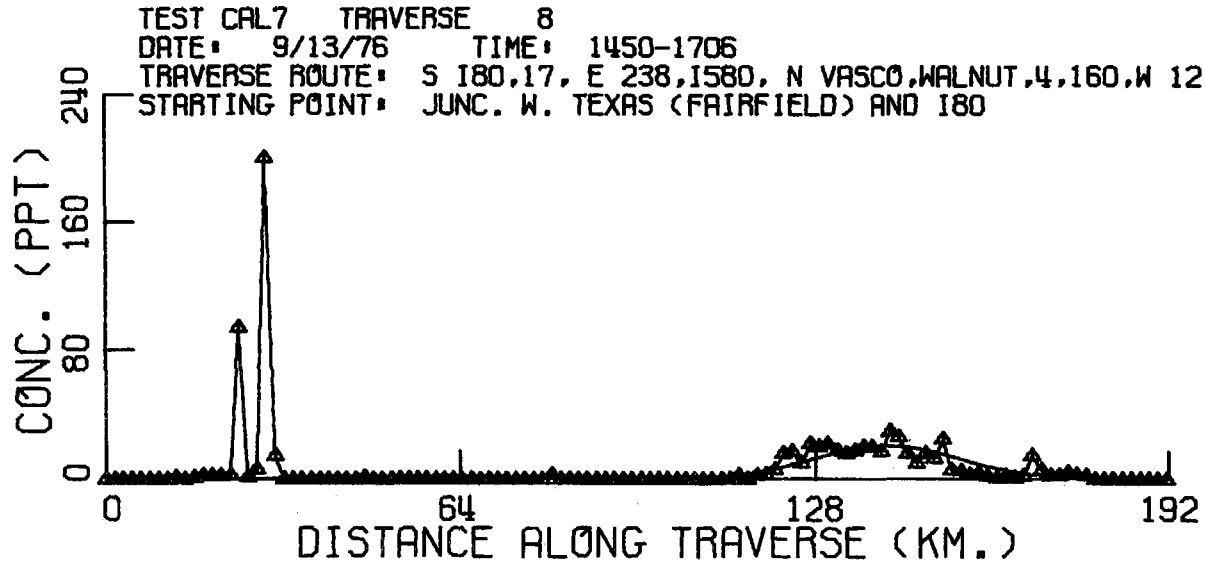

TEST CAL7 TRAVERSE 4
DATE: 9/13/76 TIME: 1130-1146
TRAVERSE ROUTE: SOUTH ON I780, I680
STARTING POINT: JUNC. I80 AND I780
CONC. (PPT)
0
80
160
240
0
9
18
27
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 6
DATE: 9/13/76 TIME: 1340-1414
TRAVERSE ROUTE: SOUTH ON I780, I680, WEST ON HWY 24
STARTING POINT: JUNC. I80 AND I780
CONC. (PPT)
0
80
160
0
18
36
54
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 7
DATE: 9/13/76 TIME: 1429-1451
TRAVERSE ROUTE: EAST ON I580
STARTING POINT: JUNC. HWY 238 AND I580
CONC. (PPT)
0
8
16
0
12
24
36
DISTANCE ALONG TRAVERSE (KM.)

Figure 129.


TEST CAL7 TRAVERSE 8
DATE: 9/13/76 TIME: 1450-1706
TRAVERSE ROUTE: S I80,17, E 238,I580, N VASCO,WALNUT,4,160,W 12
STARTING POINT: JUNC. W. TEXAS (FAIRFIELD) AND I80
CONC. (PPT)
0
80
160
240
0
64
128
192
DISTANCE ALONG TRAVERSE (KM.)


TEST CAL7 TRAVERSE 8
DATE: 9/13/76 TIME: 1450-1706
TRAVERSE ROUTE: S I80,17, E 238,I580, N VASCO,WALNUT,4,160,W 12
STARTING POINT: JUNC. W. TEXAS (FAIRFIELD) AND I80
CONC. (PPT)
0
80
160
240
0
64
128
192
DISTANCE ALONG TRAVERSE (KM.)

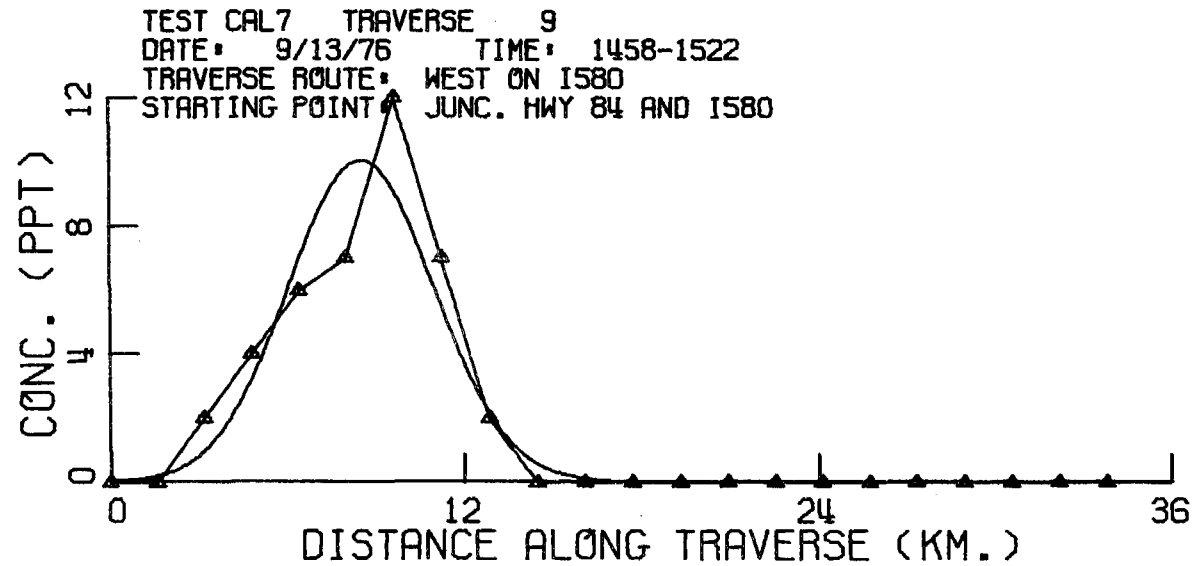

TEST CAL7 TRAVERSE 9
DATE: 9/13/76 TIME: 1458-1522
TRAVERSE ROUTE: WEST ON I580
STARTING POINT: JUNC. HWY 84 AND I580
CONC. (PPT)
0
4
8
12
0
12
24
36
DISTANCE ALONG TRAVERSE (KM.)

Figure 130.

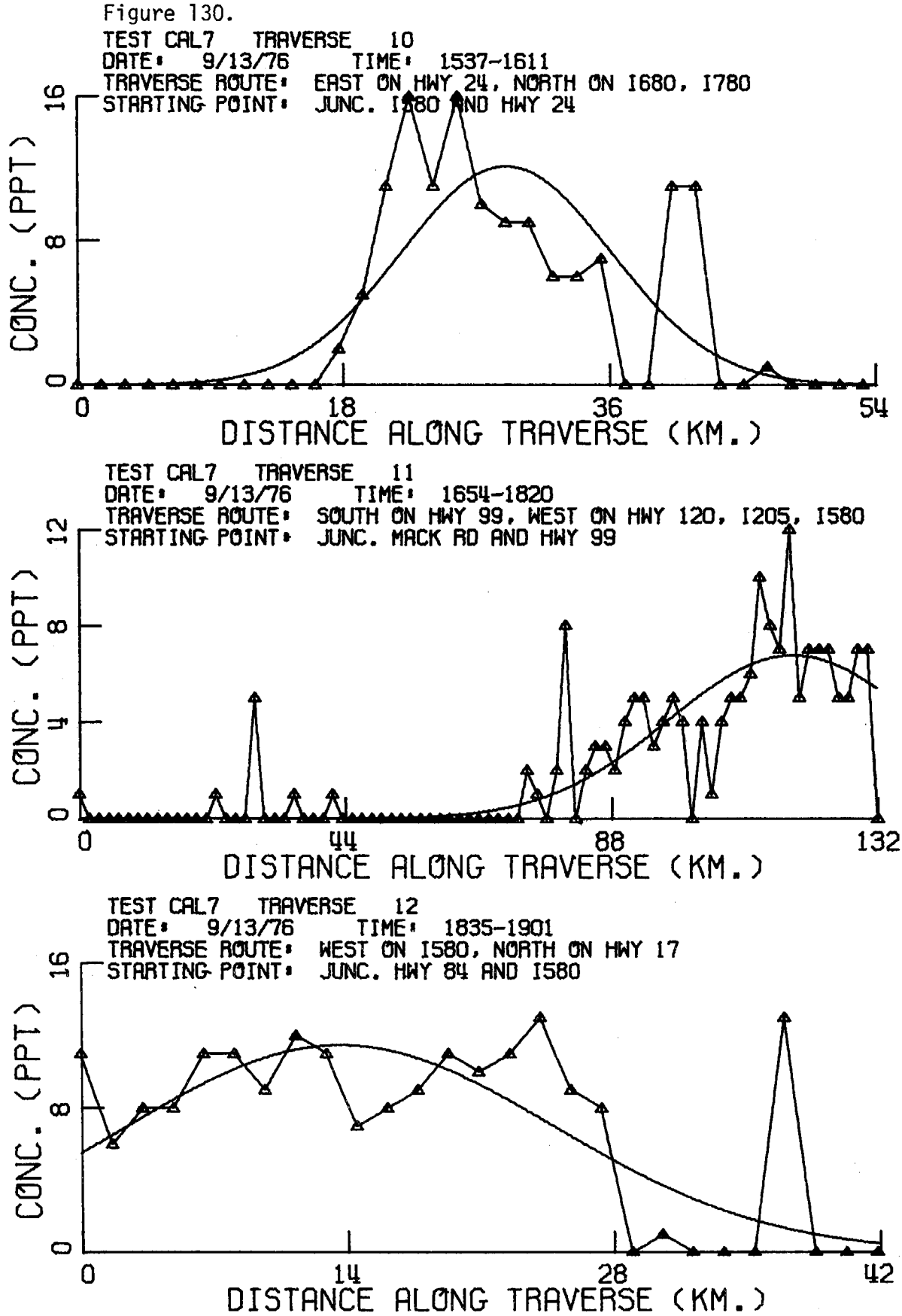

TEST CAL7 TRAVERSE 10
DATE: 9/13/76 TIME: 1537-1611
TRAVERSE ROUTE: EAST ON HWY 24, NORTH ON I680, I780
STARTING POINT: JUNC. I580 AND HWY 24
CONC. (PPT)
0
8
16
0
18
36
54
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 11
DATE: 9/13/76 TIME: 1654-1820
TRAVERSE ROUTE: SOUTH ON HWY 99, WEST ON HWY 120, I205, I580
STARTING POINT: JUNC. MACK RD AND HWY 99
CONC. (PPT)
0
4
8
12
0
44
88
132
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL7 TRAVERSE 12
DATE: 9/13/76 TIME: 1835-1901
TRAVERSE ROUTE: WEST ON I580, NORTH ON HWY 17
STARTING POINT: JUNC. HWY 84 AND I580
CONC. (PPT)
0
8
16
0
14
28
42
DISTANCE ALONG TRAVERSE (KM.)

Figure 131.

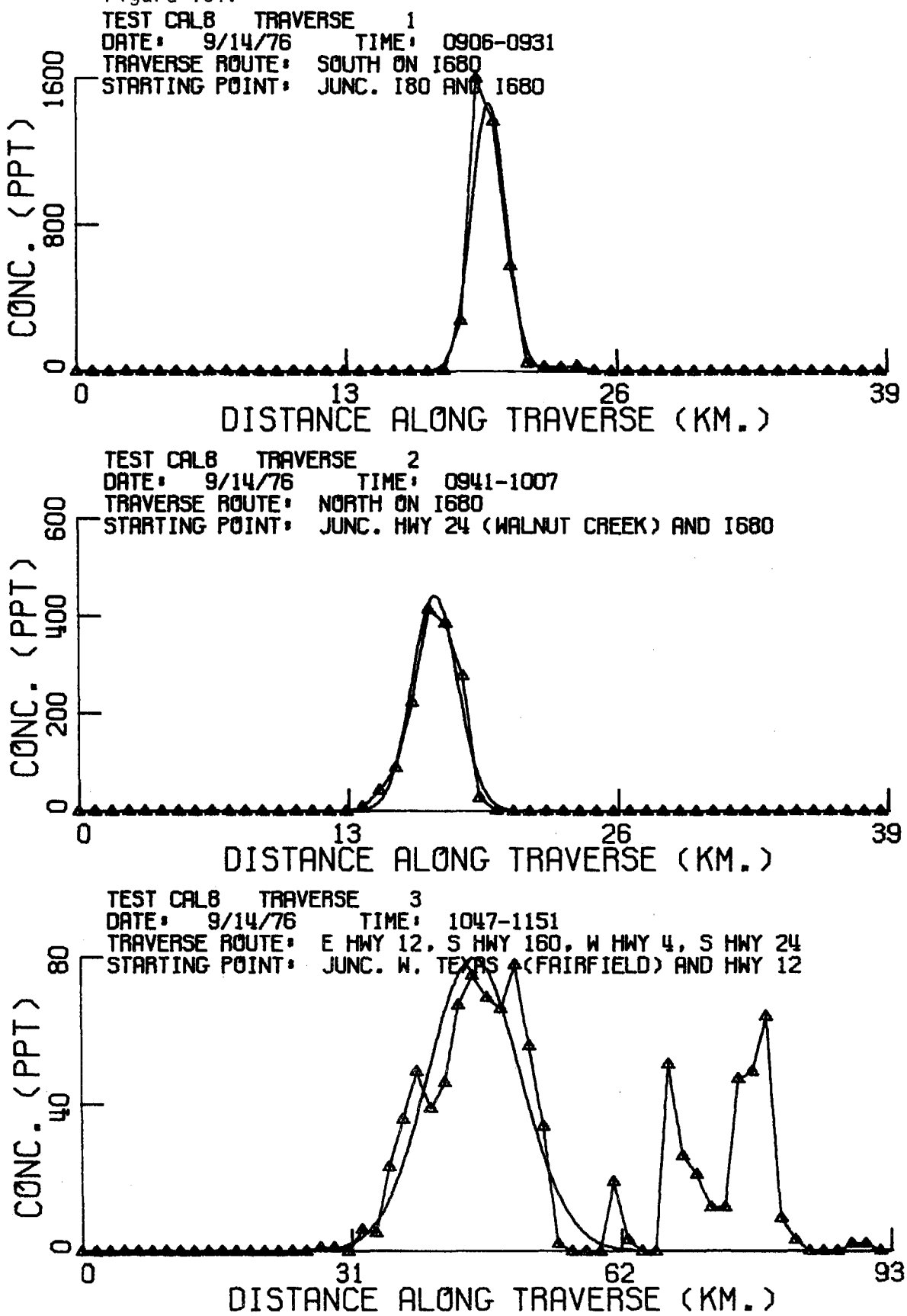

TEST CAL8 TRAVERSE 1
DATE: 9/14/76 TIME: 0906-0931
TRAVERSE ROUTE: SOUTH ON I680
STARTING POINT: JUNC. I80 AND I680
CONC. (PPT)
1600
800
0
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 2
DATE: 9/14/76 TIME: 0941-1007
TRAVERSE ROUTE: NORTH ON I680
STARTING POINT: JUNC. HWY 24 (WALNUT CREEK) AND I680
CONC. (PPT)
600
400
200
0
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)
TEST CAL8 TRAVERSE 3
DATE: 9/14/76 TIME: 1047-1151
TRAVERSE ROUTE: E HWY 12, S HWY 160, W HWY 4, S HWY 24
STARTING POINT: JUNC. W. TEXAS (FAIRFIELD) AND HWY 12
CONC. (PPT)
80
40
0
0
31
62
93
DISTANCE ALONG TRAVERSE (KM.)

Figure 132.

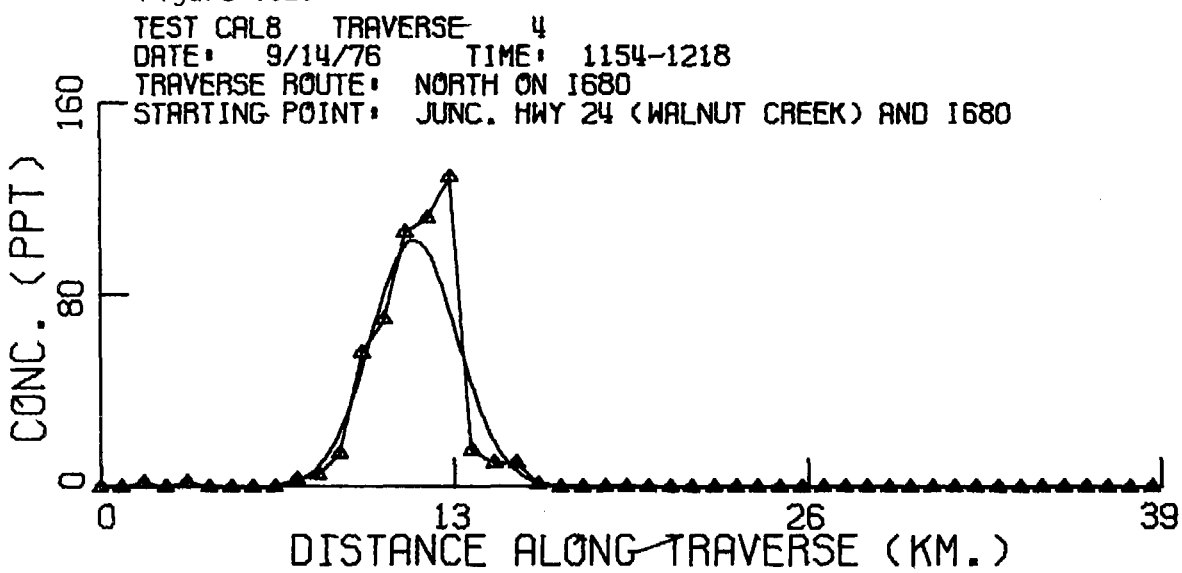

TEST CAL8 TRAVERSE 4
DATE: 9/14/76 TIME: 1154-1218
TRAVERSE ROUTE: NORTH ON I680
STARTING POINT: JUNC. HWY 24 (WALNUT CREEK) AND I680
CONC. (PPT)
160
80
0
0
13
26
39
DISTANCE ALONG TRAVERSE (KM.)

TABLE 7

BEST-FIT GAUSSIAN PLUME RESULTS

Automobile Traverse Data

Trav	Time PDT	C_0 exp (PPT)	C_0 fitted (PPT)	Y_0 exp (Km)	Y_0 fitted (Km)	X (km)	σ_y (meters)	σ_z* (meters)
Test 1 (8/31/76) SF_6 Release Rate = 10.6 grams/sec								
2	1420-1433	611	554	9.3	9.2	7.3	879	200
3	1430-1445	1013	908	10.0	9.6	8.1	909	118
4	1515-1527	756	638	8.7	10.1	6.6	1299	126
6	1630-1641	1223	560	8.0	8.9	6.5	946	198
7	1701-1753	64	41	65.2	65.8	51.9	9446	626
Test 2 (9/02/76) SF_6 Release Rate = 11.4 g/sec; $CBrF_3$ Release Rate = 16.6 g/sec								
1	1130-1143	30000	21830	5.5	5.9	1.3	312	22
2	1215-1228	30000	30210	13.8	14.2	0.8	296	17
4	1400-1415	33	26	11.6	11.6	35.2	2235	
($CBrF_3$) 4	1400-1415	2168	1228	7.7	7.7	10.7	138	657
5	1445-1503	19	10	10.6	11.4	34.1	2673	
($CBrF_3$) 5	1445-1503	840	510	8.7	9.1	10.0	487	405
6	1515-1530	28	4	8.7	10.2	32.8	4289	
7	1545-1635	304	251	6.8	5.0	25.3	115	394
9	1630-1715	29	12	57.9	60.2	70.9	24950	1169
10	1630-1737	91	16	48.3	61.2	67.4	10692	1014
($CBrF_3$) 10	1630-1737	300	111	82.1	80.6	57.0	6227	317
11	1731-1815	32	17	49.1	35.2	73.5	18340	479

*Values of σ_z were determined from a mass-balance procedure using the horizontal crosswind traverse data.

TABLE 7 (cont.)

BEST-FIT GAUSSIAN PLUME RESULTS

Automobile Traverse Data

Trav	Time PDT	C_0 exp (PPT)	C_0 fitted (PPT)	Y_0 exp (Km)	Y_0 fitted (Km)	X (km)	σ_y (meters)	σ_z* (meters)
Test 3 (9/5/76) SF_6 Release Rate = 9.5 g/sec								
1	0100-0112	8146	9476	6.1	6.1	7.3	142	35
3	0213-0259	537	458	32.2	34.4	51.7	2480	72
4	0240-0300	1856	1944	7.4	7.4	7.3	141	166
6	0259-0306	8660	4298	6.8	6.8	7.3	136	97
8	0414-0545	370	283	54.7	55.8	47.4	4503	85
9	0430-0445	6178	6775	7.2	7.3	7.3	116	80
10	0432-0517	608	506	29.5	31.3	39.5	1936	100
11	0441-0450	2852	2288	7.1	7.2	7.3	151	183
12	0502-0511	2261	1502	6.6	6.6	7.3	195	229
14	0637-0647	173	121	1.6	0.5	37.2	4685	517
Test 4 (9/6/76) SF_6 Release Rate = 10.8 g/sec								
1	1928-1946	873	710	7.1	7.2	7.3	210	
2	2130-2217	746	680	15.3	15.8	50.9	2072	93
3	2132-2140	10570	8825	7.1	7.2	7.3	191	45
4	2200-2246	628	580	15.3	17.5	50.9	1987	109
5	2214-2222	11900	10820	6.5	6.5	7.3	118	59
6	2232-2320	553	396	37.8	38.7	54.5	2787	114
7	2315-2400	553	281	35.4	39.9	58.8	3819	142

*Values of σ_z were determined from a mass-balance procedure using the horizontal crosswind traverse data.

TABLE 7 (cont.)

BEST-FIT GAUSSIAN PLUME RESULTS

Automobile Traverse Data

Trav	Time PDT	C_0 exp (PPT)	C_0 fitted (PPT)	Y_0 exp (Km)	Y_0 fitted (Km)	X (km)	σ_y (meters)	σ_z* (meters)
Test 5 (9/9/76) SF_6 Release Rate = 10.7 g/sec								
1	1255-1315	801	363	11.9	12.6	9.1	721	
2	1314-1330	528	288	8.4	8.9	9.4	877	
4	1351-1405	138	136	1.0	1.4	17.7	1192	
5	1356-1428	108	87	2.9	1.1	24.3	2416	
6	1359-1416	445	285	18.3	15.8	10.6	1636	1228
7	1413-1426	141	111	8.7	9.5	18.5	1525	
8	1436-1450	183	131	3.9	4.2	18.6	1382	
Test 6 (9/10/76) SF_6 Release Rate								
1	0800-0815	9526	21500	1.8	1.8	4.8	27	196
2	0740-0753	7981	9257	6.6	6.5	7.3	110	110
3	1001-1051	20	10	59.5	56.8	47.6	4164	
4	1023-1033	3739	2393	6.0	6.1	11.7	275	135
5	1030-1115	11	11	59.5	60.3	47.6	3062	
6	1022-1033	5954	4179	7.6	7.6	7.3	129	165
7	1103-1112	7155	6346	7.5	7.5	7.3	185	76
8	1105-1203	12	10	1.6	4.7	45.8	2975	
Airborne Spirals								
				(m)	(m)		σ_z**	
1	1158-1203	908	692	122	112	19.5	38	

* Values of σ_z were determined from a mass-balance procedure using the horizontal crosswind traverse data.

** Values of σ_z were obtained from a Gaussian best-fit of the spiral tracer data.

TABLE 7 (cont.)

BEST-FIT GAUSSIAN PLUME RESULTS

Automobile Traverse Data

	Trav	Time PDT	C_0 exp (PPT)	C_0 fitted (PPT)	Y_0 exp (Km)	Y_0 fitted (Km)	X (km)	σ_y (meters)	σ_z* (meters)
Test 7 (9/13/76) SF_6 Release Rate = 11.5 g/sec									
$CBrF_3$ Release Rate = 16.0 g/sec									
	1	0924-0956	614	459	33.8	37.2	15.3	3714	1388
($CBrF_3$)	2	0940	12140	5896	1.7	1.5	4.6	310	106
	3	1113-1217	94	60	48.3	52.3	50.7	4697	736
	4	1130-1146	180	151	24.1	25.1	22.0	6165	3481
	6	1340-1414	131	87	30.6	23.0	22.4	6944	792
	7	1429-1451	14	15	14.5	19.6	47.4	3881	
	8	1450-1706	200	95	29.0	27.8	5.6	375	492
	8	1450-1706	30	21	141.6	140.9	54.7	13203	
	9	1458-1532	12	10	9.7	8.5	52.7	1654	
	10	1537-1611	16	12	22.5	29.0	22.9	6746	
	11	1654-1820	12	7	117.5	118	65.9	14520	
	12	1654-1820	13	11	24.1	13.6	42.8	9881	
				Spirals					
					(m)	(m)		σ_z**	
	1	0854-0849	109	109	61	113	21.5	59	
	3	1008-1011	413	485	122	141	21.5	77	

*Values of σ_z were determined from a mass-balance procedure using the horizontal crosswind traverse data.

**Values of σ_z were obtained from a Gaussian best-fit of the spiral tracer data.

TABLE 7 (cont.)

BEST-FIT GAUSSIAN PLUME RESULTS

Automobile Traverse Data

Trav	Time PDT	C_0 exp (PPT)	C_0 fitted (PPT)	Y_0 exp (Km)	Y_0 fitted (Km)	X (km)	σ_y (meters)	σ_z* (meters)
Test 8 (9/14/76) SF_6 Release Rate = 10.9 g/sec								
1	0906-0931	1598	1461	19.3	19.9	14.4	713	273
2	0941-1007	412	440	16.9	17.2	15.7	953	
3	1047-1151	78	80	49.9	45.2	48.9	4604	380
4	1154-1220	129	103	12.9	11.6	18.4	1016	
Spirals								
				(m)	(m)			σ_z**
1	0921-0926	858	541	137	169	21.5		91

* Values of σ_z were determined from a mass-balance procedure using the horizontal crosswind traverse data.

**Values of σ_z were obtained from a Gaussian best-fit of the spiral tracer data.

3.7 Airborne Spiral Best-fit Gaussian Curves

A best-fit Gaussian curve through the data can be determined in the same manner as that used for the automobile traverses (Section 3.4). In this case, Y_0 is the height along the spiral, C_0 is the centerline concentration, and the standard deviation becomes the vertical dispersion parameter, σ_z. The results are shown in the following figures. The best-fit parameters are listed in Table 7. The analysis of σ_z is more restricted than that of σ_y for three reasons: (1) the spiral location may or may not have been at the centerline of the plume; (2) the plane was spiraling downward with a horizontal diameter of approximately 400 meters; and (3) the tracer plume was reflected from the ground which prevented a perfect Gaussian distribution of tracer. If the spiral was not taken along the centerline, the calculated σ_z will be smaller than the actual σ_z. Because the plane moves horizontally, the data represent a vertical profile averaged over 400 meters of the plume crosswidth. In some cases, samples may have been taken completely outside of the plume. Reflection of tracer at the ground results in a buildup of material along the ground and causes the tracer distribution to be skewed and non-Gaussian. In any use of the σ_z best-fit parameters, the effects of these restrictions must be accounted for in the analysis.

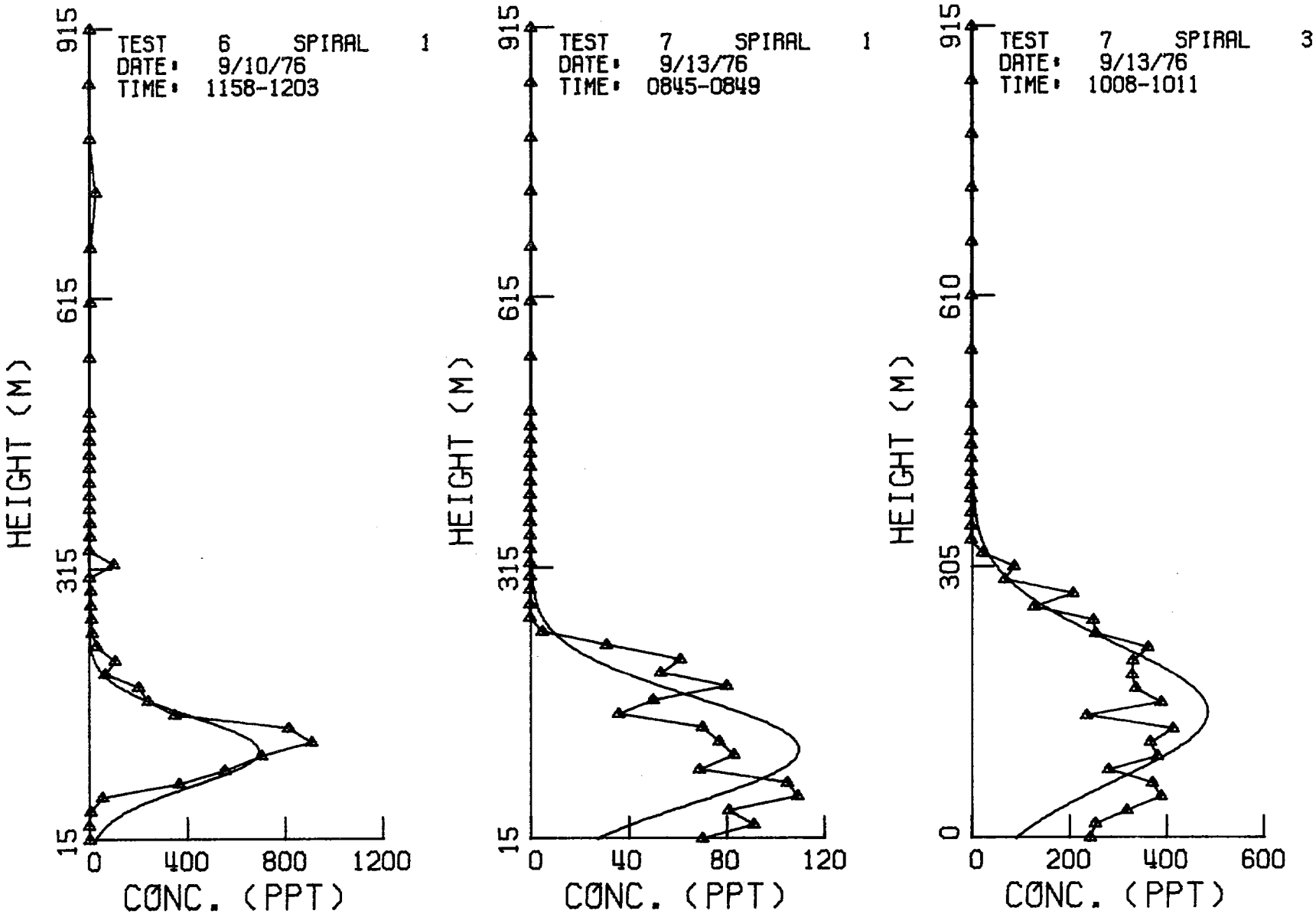
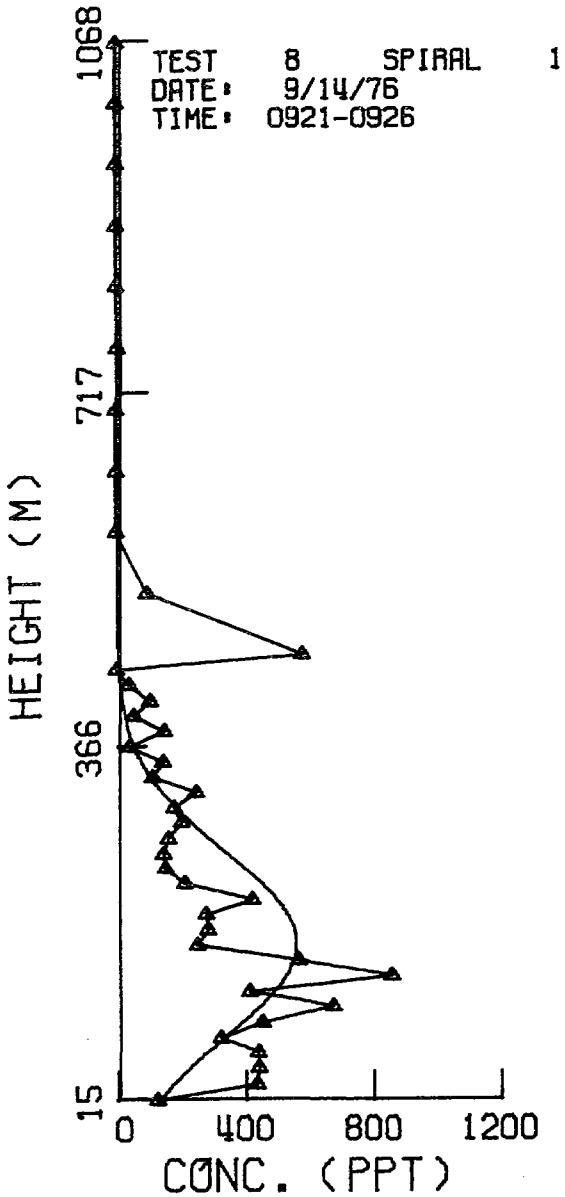

TEST 6 SPIRAL 1
DATE: 9/10/76
TIME: 1158-1203
HEIGHT (M)
915
615
315
15
0
400
800
1200
CONC. (PPT)
TEST 7 SPIRAL 1
DATE: 9/13/76
TIME: 0845-0849
HEIGHT (M)
915
615
315
15
0
40
80
120
CONC. (PPT)
TEST 7 SPIRAL 3
DATE: 9/13/76
TIME: 1008-1011
HEIGHT (M)
915
610
305
0
0
200
400
600
CONC. (PPT)

Figure 133.


TEST 8 SPIRAL 1
DATE: 9/14/76
TIME: 0921-0926
HEIGHT (M)
1068
717
366
15
0
400
800
1200
CONC. (PPT)
Figure 134.