DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

Permanent-Glass EDM Measurements on Kilauea, Hawaii From June 6, 1979 to September 23, 1987

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Table Of Contents

EDM *trilateration surveys* are manpower intensive and require a concerted effort by the staff at HVO to complete. These surveys are usually done bracketing a major volcanic or tectonic event, and the data are modeled to obtain information such as that mentioned above. In order that the data gathered be interpretable, the EDM measurements of a trilateration survey must be comprehensive, precise, and completed in a relatively short period of time.

On the other hand, using EDM measurements to *monitor* the current state of a volcano requires that more frequent periodic measurements be made, and the precision and density of the network need not be as great. These factors spurred the development of the "permanent-glass EDM" technique to measure horizontal distances with less commitment of time and manpower. This technique utilizes permanently installed reflectors, eliminating the need for a person to set up a reflector over a specific benchmark every time a measurement is made.

Purpose and Scope of Report

This purpose of this report is to present the results of permanent-glass EDM measurements on Kilauea from the time the first lines were measured on June 6, 1979 to September 23, 1987. We report data for all permanent-glass EDM lines ever measured on Kilauea, but discuss in more detail those monitors that were set up to track ground deformation with frequent measurements over a long period of time. Data reported here are preliminary and subject to revision as refinements are made to data reduction procedures. Also included in this report are station descriptions with location maps, and documentation of equipment and measurement procedures.

Acknowledgements

Many people were involved in planning, installing, and measuring the permanent-glass EDM monitors on Kilauea particularly A.T. Okamura, K.M. Yamashita, M.K. Sako, E.W. Wolfe, N.G. Banks, and J.J. Dvorak. Excellent computer support was provided by T.T. English and P.T. Delaney. This paper has greatly benefited from reviews by C.C. Heliker and T.L. Wright. My thanks to all of the above.

Equipment

Since May 14, 1981, we have used a Keuffel and Esser RangeMaster III EDM instrument to measure the lines of the permanent-glass network on Kilauea. Prior to this date, we used both a Geodimeter Model 8 and a Hewlett-Packard 3808a EDM instruments.

There are two types of permanent-glass reflector stations on Kilauea. The earlier stations were installed using standard highway reflectors, which had a limited range over which reflected signal could be received. Some of these stations still exist but are measured infrequently. All of the monitors that we currently measure on a routine basis utilize relatively inexpensive, sealed, nitrogen-filled prisms at the reflector stations. These prisms have higher reflectance than the highway reflectors permitting measurements up to 10 km using three prisms and have allowed the Kilauea permanent-glass EDM network to grow to its present size.

To correct for atmospheric effects on the line measurements, we record temperature and altitude readings while a specific line is being measured only at the instrument station. The temperature is measured to a tenth of a degree fahrenheit with a Electro-therm TM-99 digital thermometer that has a shielded probe attached to the top of a telescopic pole 6 m above the ground surface. The altitude is measured to the nearest 20 feet using a Wallace and Tiernan altimeter.

Measurement Procedure

The procedure we use to measure a permanent-glass EDM line is listed below.

1. Set up EDM instrument over station mark and temperature probe on pole 6 m above the ground surface.
2. Allow EDM instrument to warm up for at least ten minutes.
3. Measure the height of the instrument. The height of the instrument above the ground is measured from the disk or top of the steel rod to the horizontal axis about which the instrument rotates vertically. (The height of the reflector station is always assumed to be 50 cm).
4. Begin measuring the length of the line with the EDM instrument and recording temperature and altitude measurements for atmospheric corrections.
5. Record one temperature reading for every two line length measurements. Record two altitude measurements, one at the start and one at the end of a complete set of line length measurements.
6. After ten line length measurements are recorded, check to see that all readings are within 20 mm of each other. If they are, the set of line length measurements is complete.
7. If the readings are not within 20 mm of each other, take two more readings. Discard the high and low value of the set of twelve readings and if the remaining readings are within 20 mm of each other, the set of line length measurements are complete.

8. If they are not, take a minimum total of fifteen readings to complete the set of line length measurements.
9. Record the last altitude and temperature readings.

We reduce the raw line length and atmospheric correction measurements to a mark to mark slope distance using computer programs developed at HVO.

Kilauea Permanent-glass EDM Network

The instrument stations on Kilauea are marked by a standard survey disk cemented into bedrock, or by a steel rod driven and sometimes cemented into the ground. The EDM instrument is set up directly over the "+" on the survey disk or centered on the top of the steel rod using an optical tribrach. The reflector station consists of a reflector or prism attached to a steel rod that is embedded (sometimes cemented) in the ground.

Permanent-glass EDM measurements started on Kilauea in June 1979 with the installation of monitors by A.T. Okamura and others on the middle east rift zone at Puu Kamoamoa, Kalalua, and Puu Kiai. In June 1982, monitors across the summit, the upper southwest rift zone, and the upper northeast rift zone were installed using the sealed, nitrogen-filled prisms that are still in use to this day. These early monitors were installed with the intention of reducing the reliance on resource-intensive EDM surveys to determine the present state of the volcano. Currently, there are seven monitors covering the summit, both rift zones, and the southern flank of Kilauea (see figure 1) that are measured on a routine basis :

1. Summit Cross-Caldera monitor
2. Summit Quadrilateral monitor
3. Upper Southwest Rift Zone monitor
4. Upper East Rift Zone monitor
5. South Flank Hilina Pali monitor
6. South Flank Holei Pali monitor
7. South Flank Kalapana monitor

These monitors are discussed in more detail below. Time series plots of each of the monitor's individual line lengths are presented starting on page 14, and the measurement data are listed in Tables 1 to Table 7. The descriptions of the permanent-glass EDM stations of these monitors are located in Appendix I, and their coordinates are listed in Appendix II. Table 8 contains data for lines that are infrequently or no longer measured.

Summit Cross-Caldera Monitor

The original four lines of the *summit cross-caldera monitor* was installed in June 2, 1982 and has since increased to eight lines (see figure 2), all measured from the HVO113 instrument station. One reflector station, KALP4, was abandoned in December 1983 after ground cracks, due to slumping of the crater wall of Halemaumau, disturbed the station. Six lines extend southeast from HVO113 into and across the caldera, with the farthest reflector station located on the Kalanaokuaiki Pali. Two lines extend from HVO113 northwest onto the "stable" slope of Mauna Loa. This monitor is the most frequently measured on Kilauea and over the years have recorded some of the largest changes in line length. Several lines of this monitor cross the southern part of the caldera where, historically, magma under the summit area has been stored. The summit cross-caldera monitor is usually measured at least once per month.

Summit Quadrilateral Monitor

The *summit quadrilateral monitor* (figure 3) is another monitor on the summit of Kilauea and has been in existence since December 13, 1985. This monitor was established to replace the summit EDM trilateration monitor which was becoming more difficult to measure on a regular basis because of the lack of manpower and time. We tested the effectiveness of this monitor by measuring it during the frequent inflation/deflation cycles of the Puu O'o eruption. In all cases, the summit quadrilateral monitor responded in a way consistent with other deformation measurements. The advantage that this monitor has over the cross-caldera monitor is that it can be used to solve for the exact location of the ground deformation. The six lines of this monitor are usually measured at least once per month.

Upper Southwest Rift Zone Monitor

The *upper southwest rift zone monitor* (figure 4) consists of nine lines that extend from the LACY instrument station (located on the slope of Mauna Loa) southeast to, and across, the southwest rift zone of Kilauea The original four lines of this monitor were set up on June 1, 1982 to track any ground deformation caused by intrusions or eruptions on the southwest rift zone. Five more lines were added in September 1982. The lines also responds to large summit inflation and deflation episodes. This monitor is usually measured once every two months.

Upper East Rift Zone Monitor

The three lines that make up the *upper east rift zone monitor* (figure 5) were installed in June 1982. This monitor has lines extending from instrument station ESCAPE RD 95, north of the east rift zone, to reflector station APUA PERM, located at the shore line south of the rift zone. This monitor crosses a complex structural area where the east rift zone turns from a southeasterly to easterly direction and also spans the southern flank from the east rift zone to the ocean. This monitor is usually measured at least once every two months, but has been done more frequently during the recent eruption on the middle east rift zone.

South Flank Hilina Pali Monitor

The *south flank Hilina Pali monitor* (figure 5) was established on July 20, 1982. This monitor consists of four lines extending south from the HILINA instrument station, located at the end of the Hilina Pali Road, with the farthest reflector station located near the shoreline. This monitor, like the other south flank monitors, was installed to record any horizontal movement of the faults on the south flank of Kilauea, mainly related to tectonic effects. This monitor is usually measured once every two months.

South Flank Holei Pali Monitor

The relatively new *south flank Holei Pali monitor* (figure 5) located near the horseshoe turn of the Chain of Craters Road, was installed on September 26, 1986. The four lines of this monitor extend southward from the HVO162 instrument station and essentially replaces an EDM trilateration monitor that had became harder to reoccupy due to the limited time and manpower at HVO. This monitor is usually measured once every two months.

South Flank Kalapana Monitor

The *south flank Kalapana monitor* (figure 6) was established on December 17, 1982 and is located near the coastal village of Kalapana. There are three lines that extend northwest from the PAINTED CHURCH instrument station (located in the village of Kalapana) up onto the south slope of the east rift zone. One of the original reflector stations FLOW77-3 was replaced by FLOW77-4 after the station was disturbed. This monitor is usually measured once every two months.

There was another line (QUEENS BATH to BMFORD) near this monitor that was established on September 13, 1983, but the QUEENS BATH instrument station was overrun by lava in March 1987.

Results

The measurement results of the currently measured permanent-glass EDM lines are presented in two ways. A seperate time series plot for each line of a monitor is plotted showing the line's length from the first measurement through September 1987. On the plots, significant events such as eruptions and earthquakes are marked to show the effect, if any, that these events had on the individual lines. All of the plots run from Jaunuary 1, 1982 to December 31, 1987 and have a full scale line length difference of 1 meter. The plots start on page 14 with the summit cross-caldera monitor.

The actual data that these plots are based on are presented in Tables 1 through 7. Table 8 contains data for lines that are currently inactive or seldom measured. The length of the line given is the slope distance measured from mark to mark, and the code for the instrument type is as follows:

RM	=	Keuffel and Esser RangeMaster III
HP	=	Hewlett-Packard 3808a
G8	=	Geodimeter Model 8

References

Hanatani, R.Y., 1987, Permanent-glass EDM measurements on Mauna Loa, Hawaii From August 8, 1979 to August 5, 1987: U.S. Geological Survey Open-File Report [in press].

FIG. 1 KILAUEA PERMANENT-GLASS EDM NETWORK

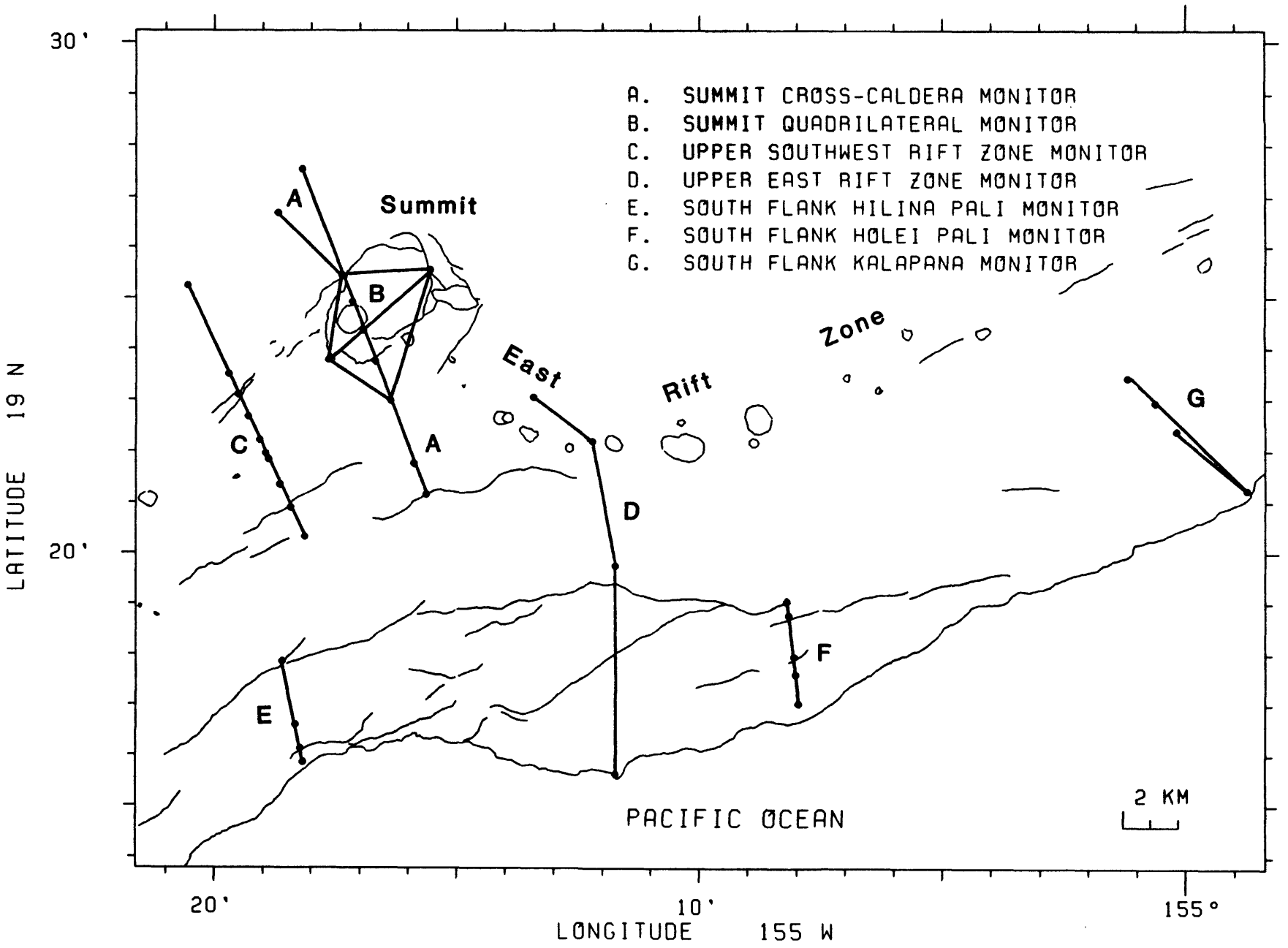


FIG. 2 KILAUEA SUMMIT CROSS-CALDERA PERMANENT-GLASS EDM MONITOR

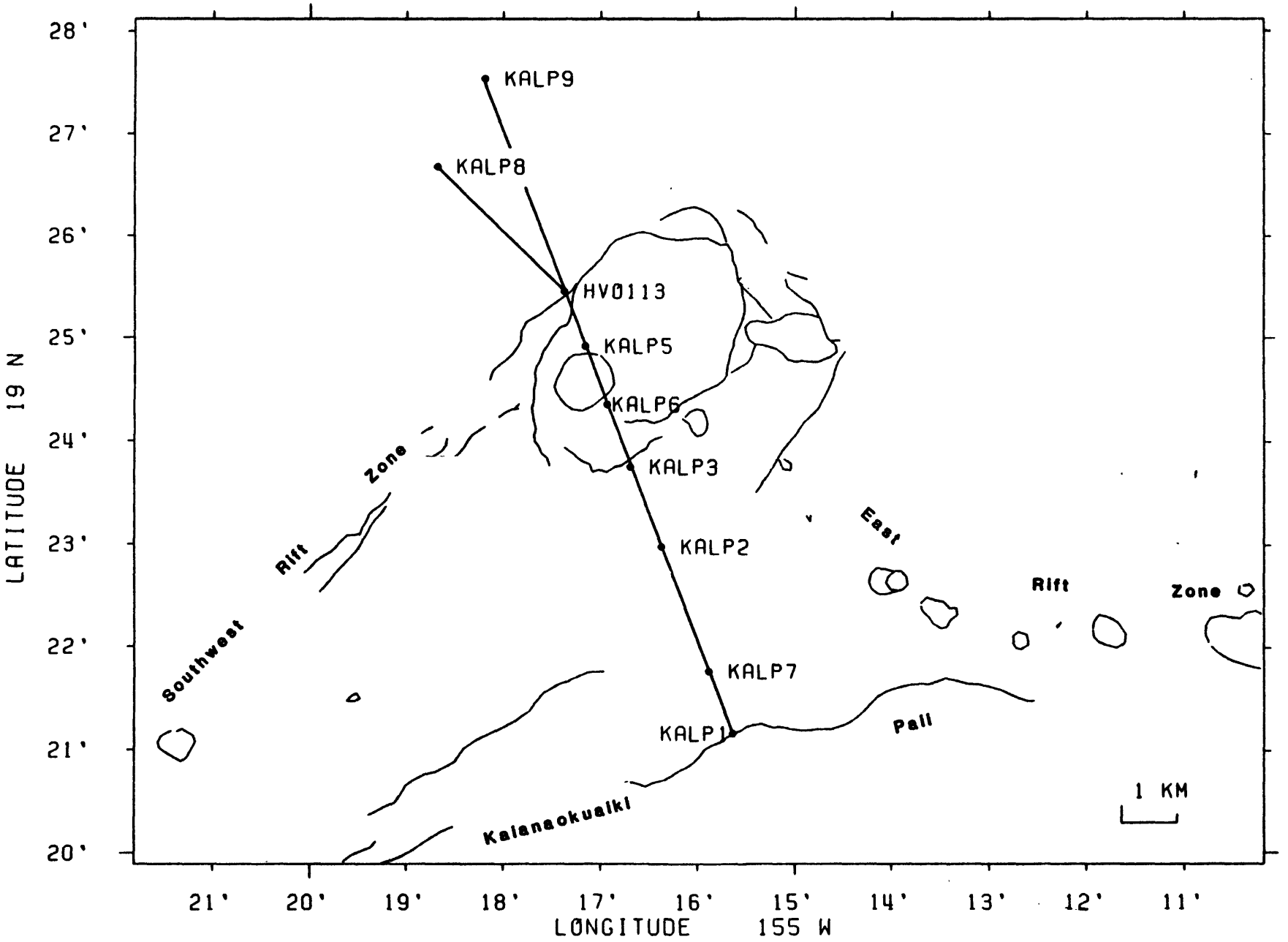


FIG. 3 KILAUEA SUMMIT QUADRILATERAL PERMANENT-GLASS EDM MONITOR

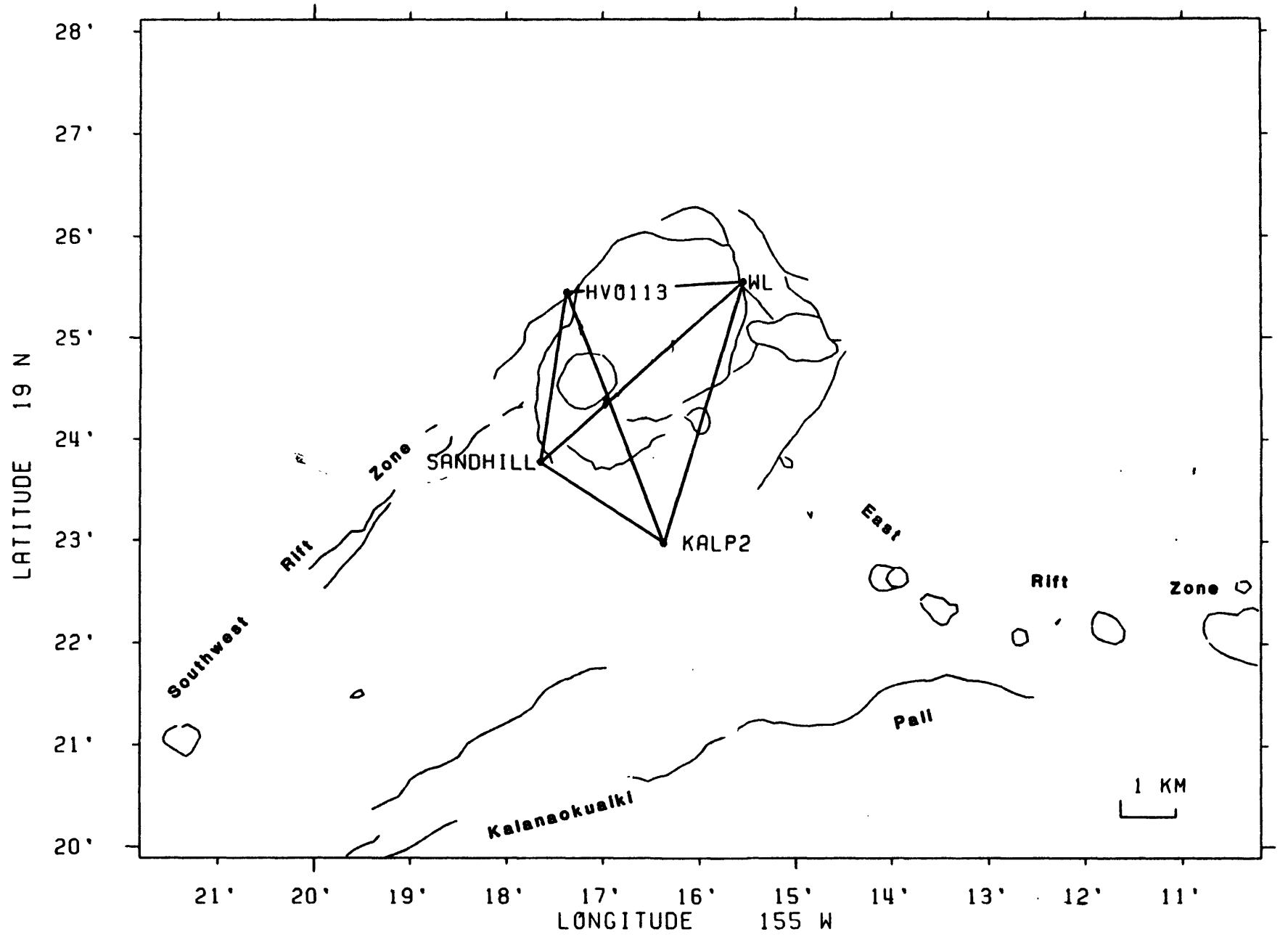


FIG. 4 KILAUEA UPPER SOUTHWEST RIFT ZONE PERMANENT-GLASS EDM MONITOR

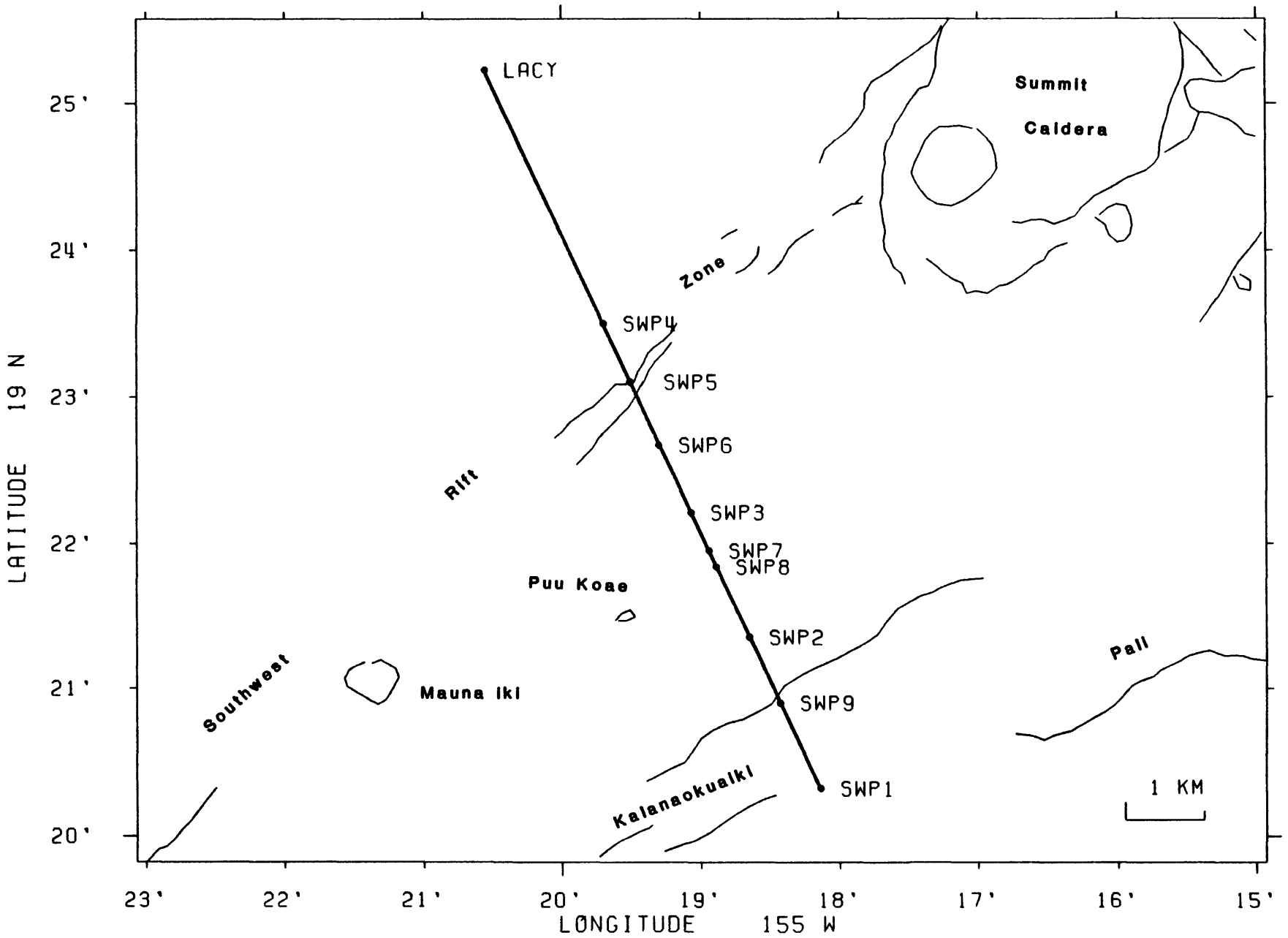


FIG. 5 KILAUEA UPPER EAST RIFT ZONE AND SOUTH FLANK (HILINA & HOLEI) PERMANENT-GLASS EDM MONITORS

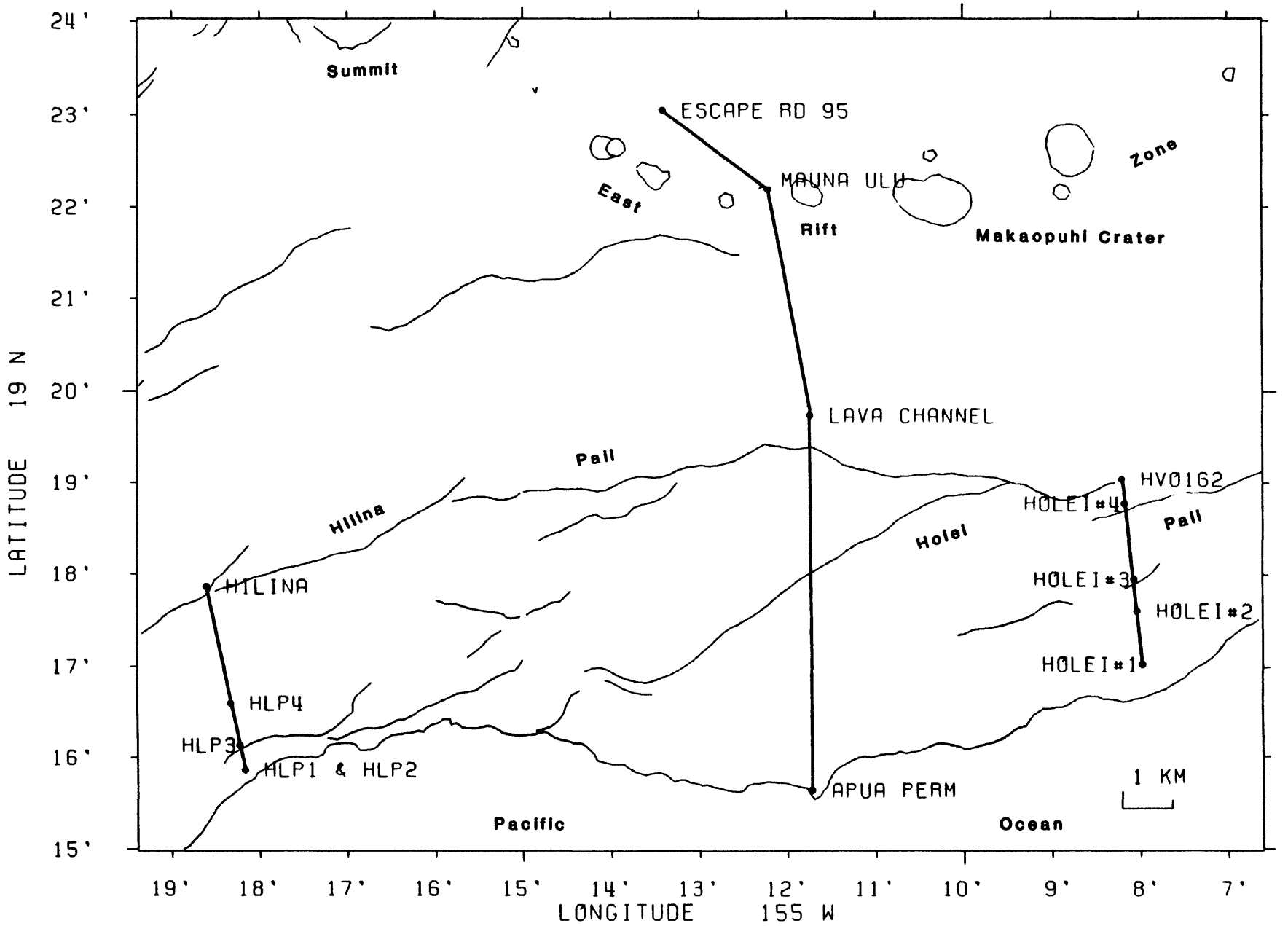
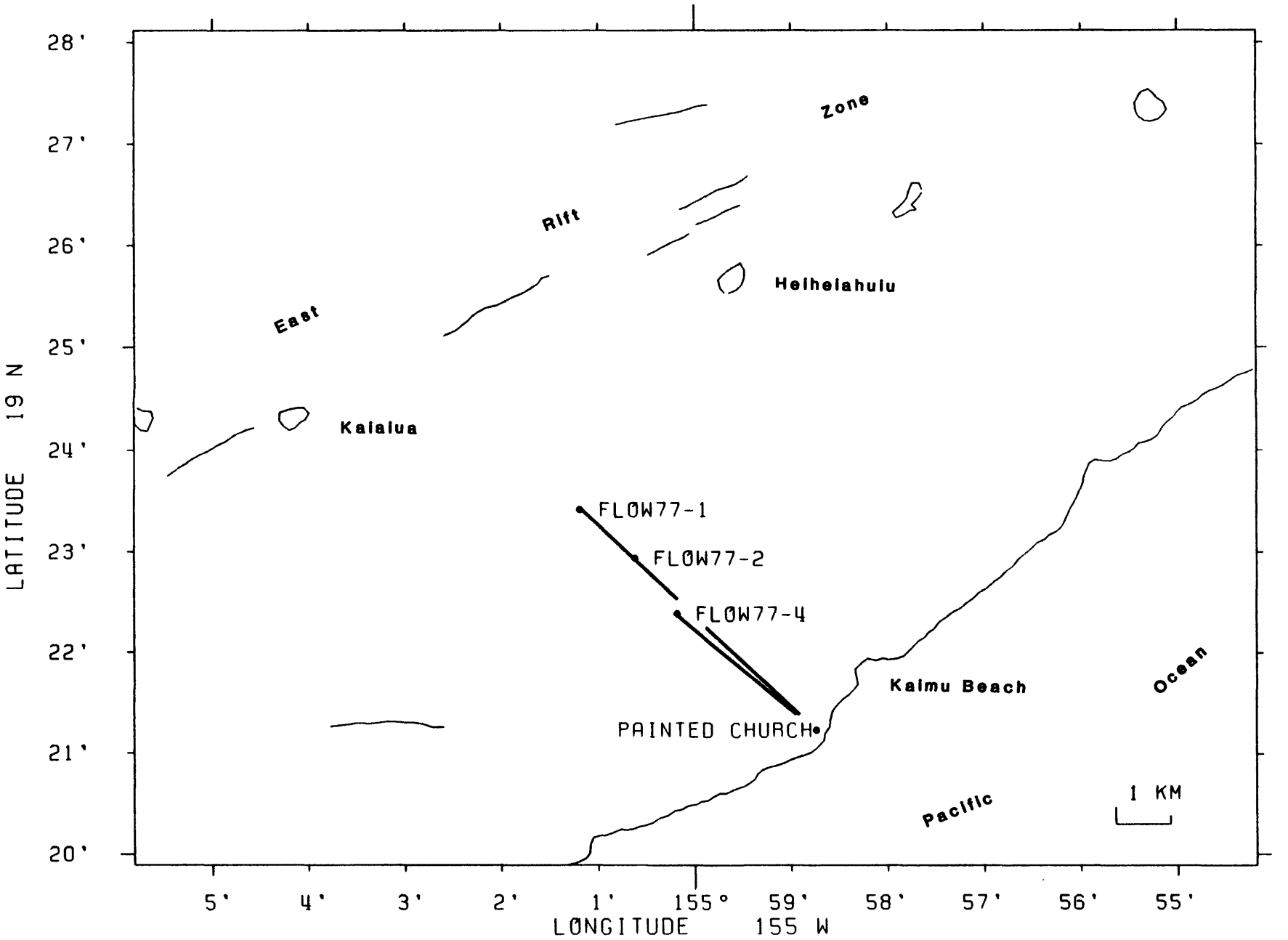
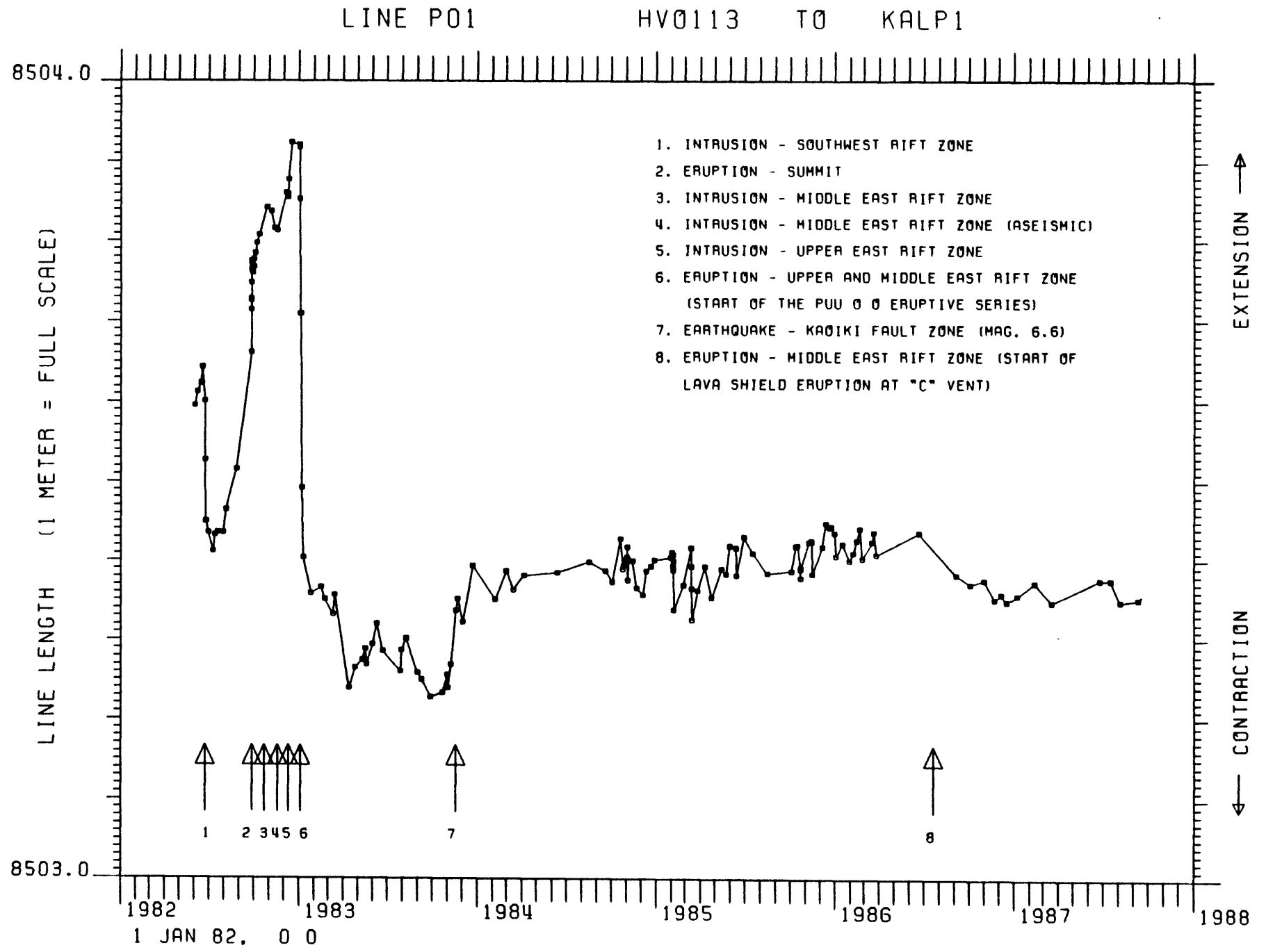


FIG. 6 KILAUEA SOUTH FLANK KALAPANA PERMANENT-GLASS EDM MONITOR



KILAUEA SUMMIT CROSS - CALDERA MONITOR
INDIVIDUAL LINE LENGTH TIME SERIES PLOTS


LINE P01 HV0113 TØ KALP1
8504.0
8503.0
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU Ø Ø ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1
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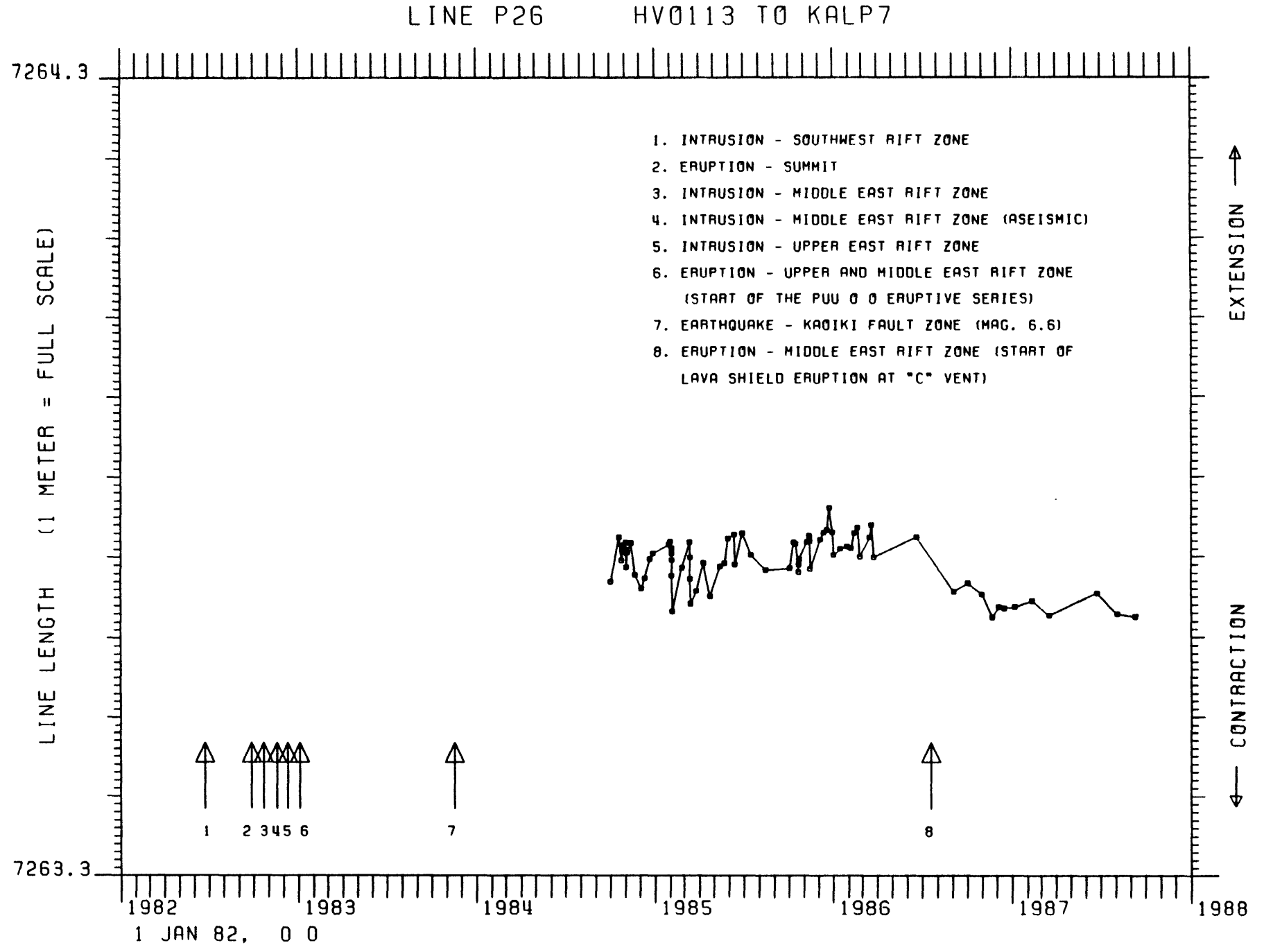
LINE P26 HV0113 TO KALP7
7264.3
7263.3
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
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2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
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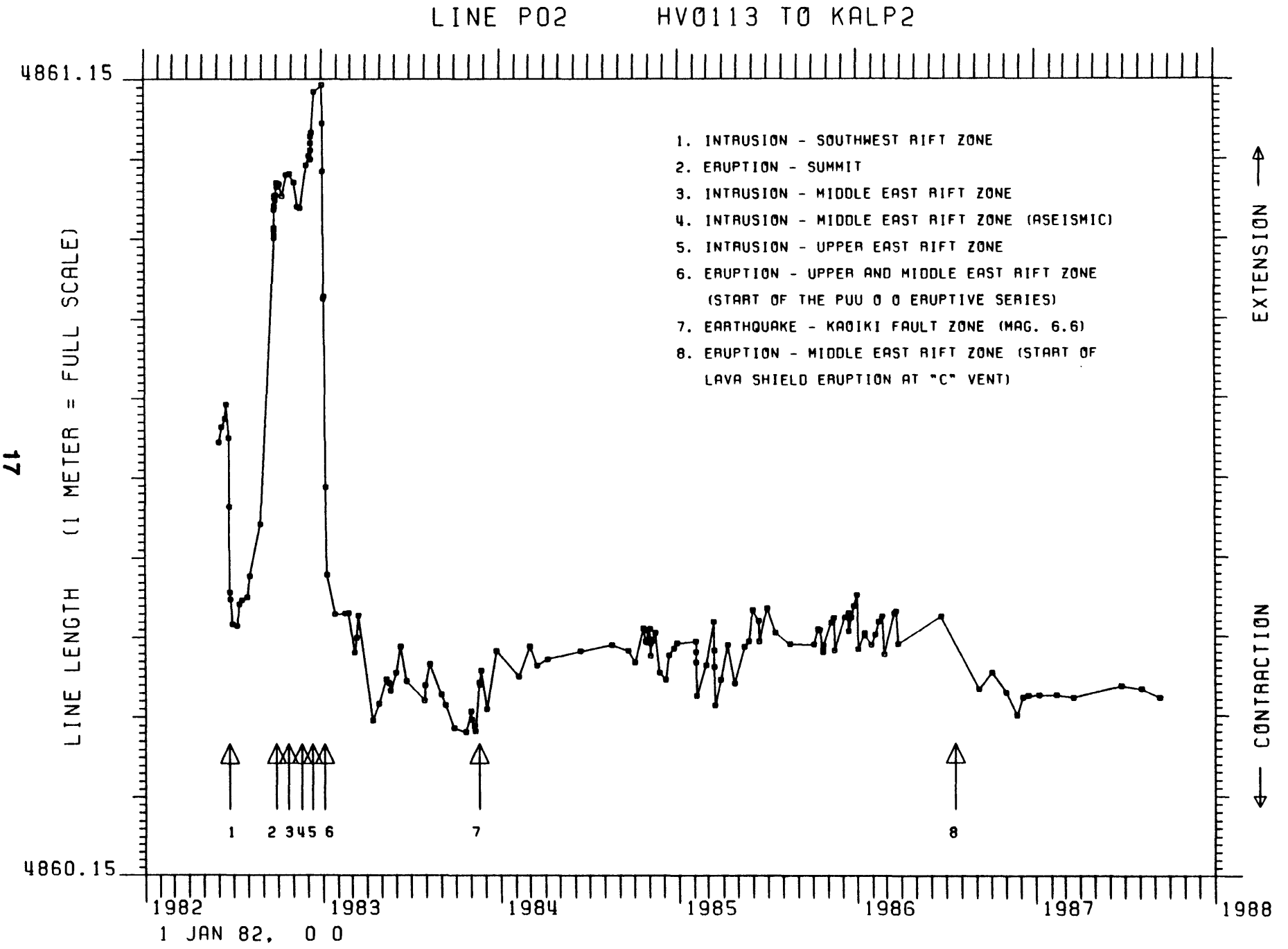
LINE P02 HV0113 T0 KALP2
4861.15
4860.15
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
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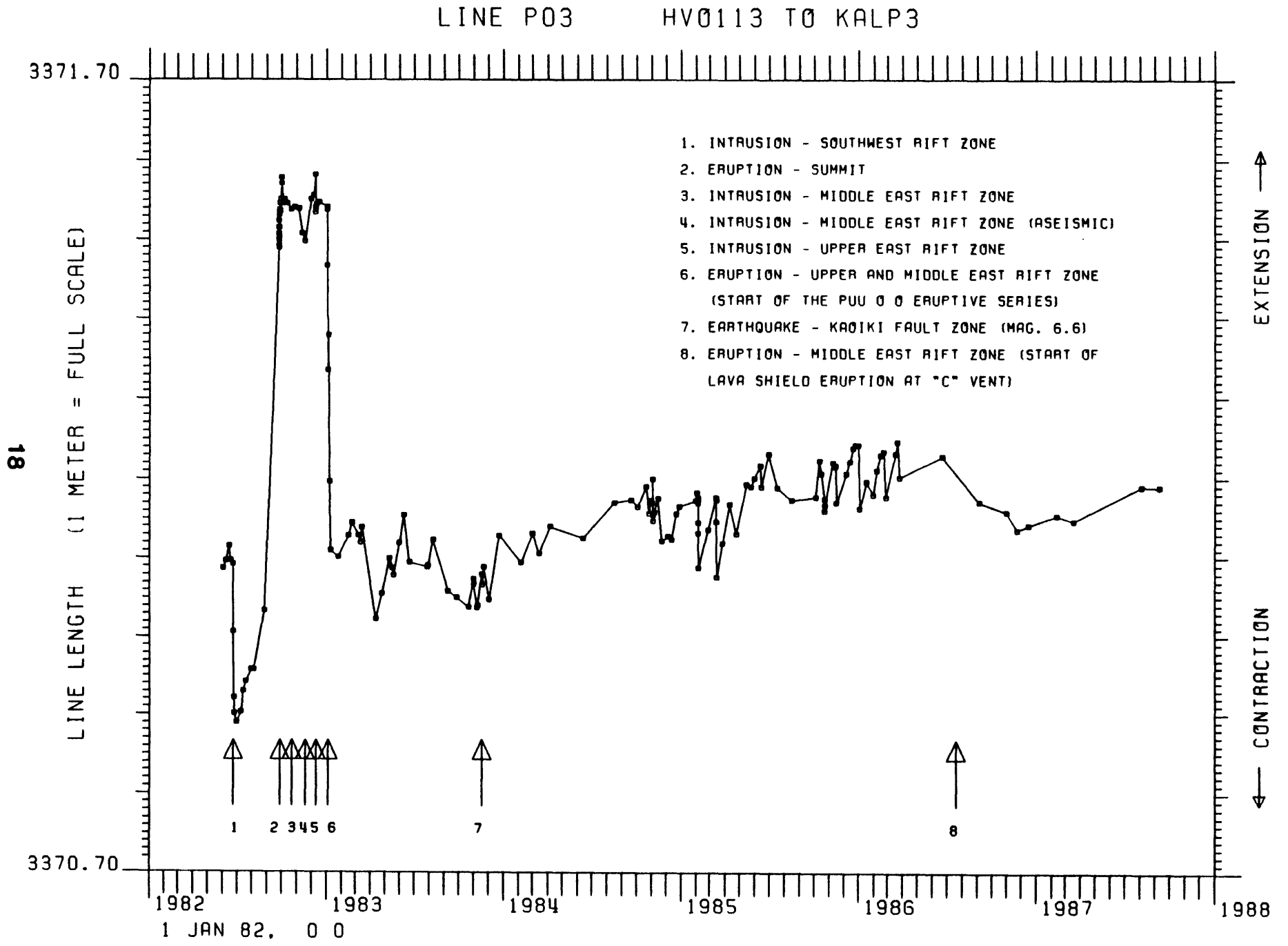
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU 0 0 ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1 2 3 4 5 6 7 8
1982 1983 1984 1985 1986 1987 1988
1 JAN 82, 0 0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3371.70
3370.70
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EXTENSION
CONTRACTION
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2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
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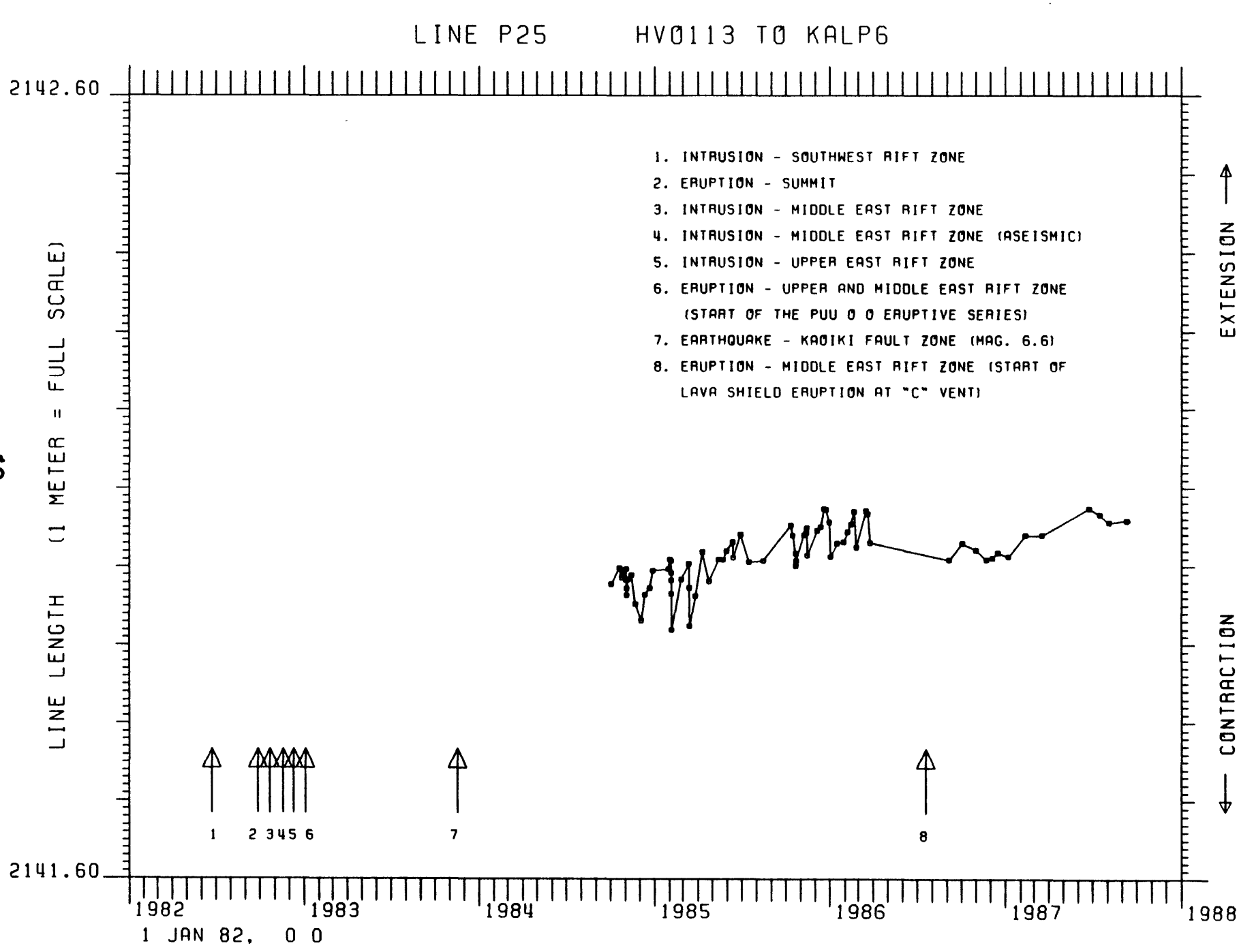
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2141.60
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EXTENSION
CONTRACTION
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2. ERUPTION - SUMMIT
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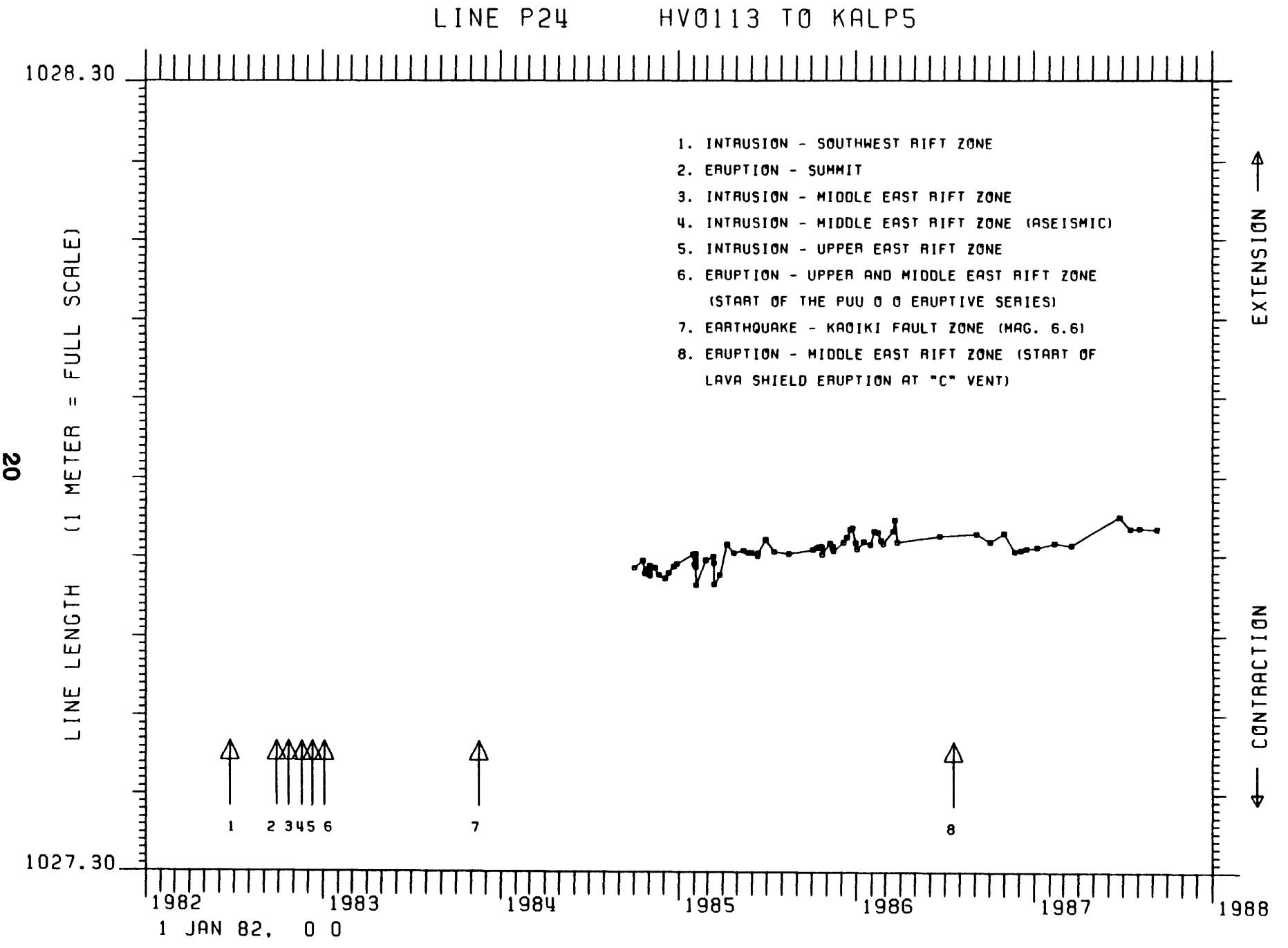
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1027.30
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
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2. ERUPTION - SUMMIT
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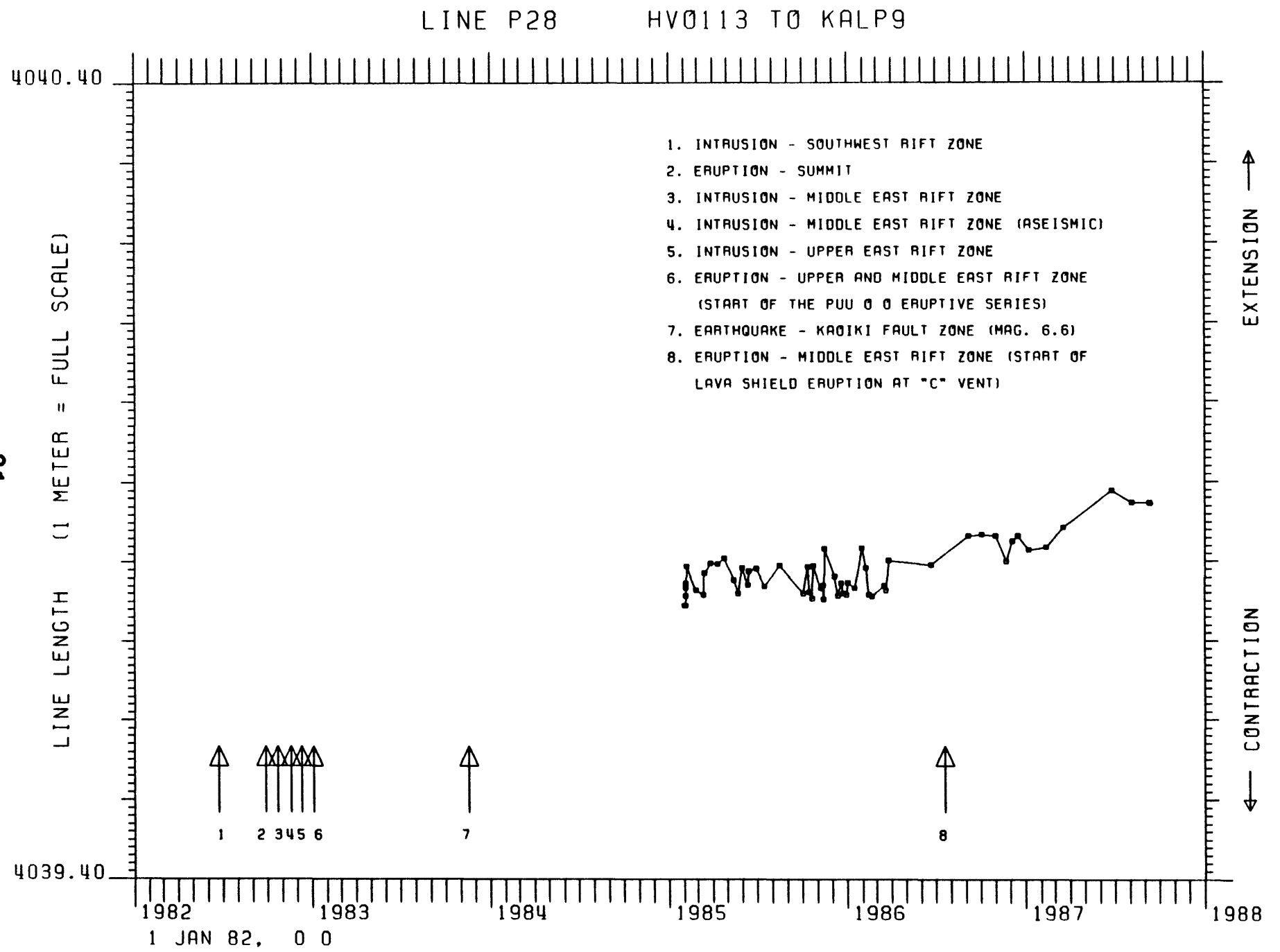
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4040.40
4039.40
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
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2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
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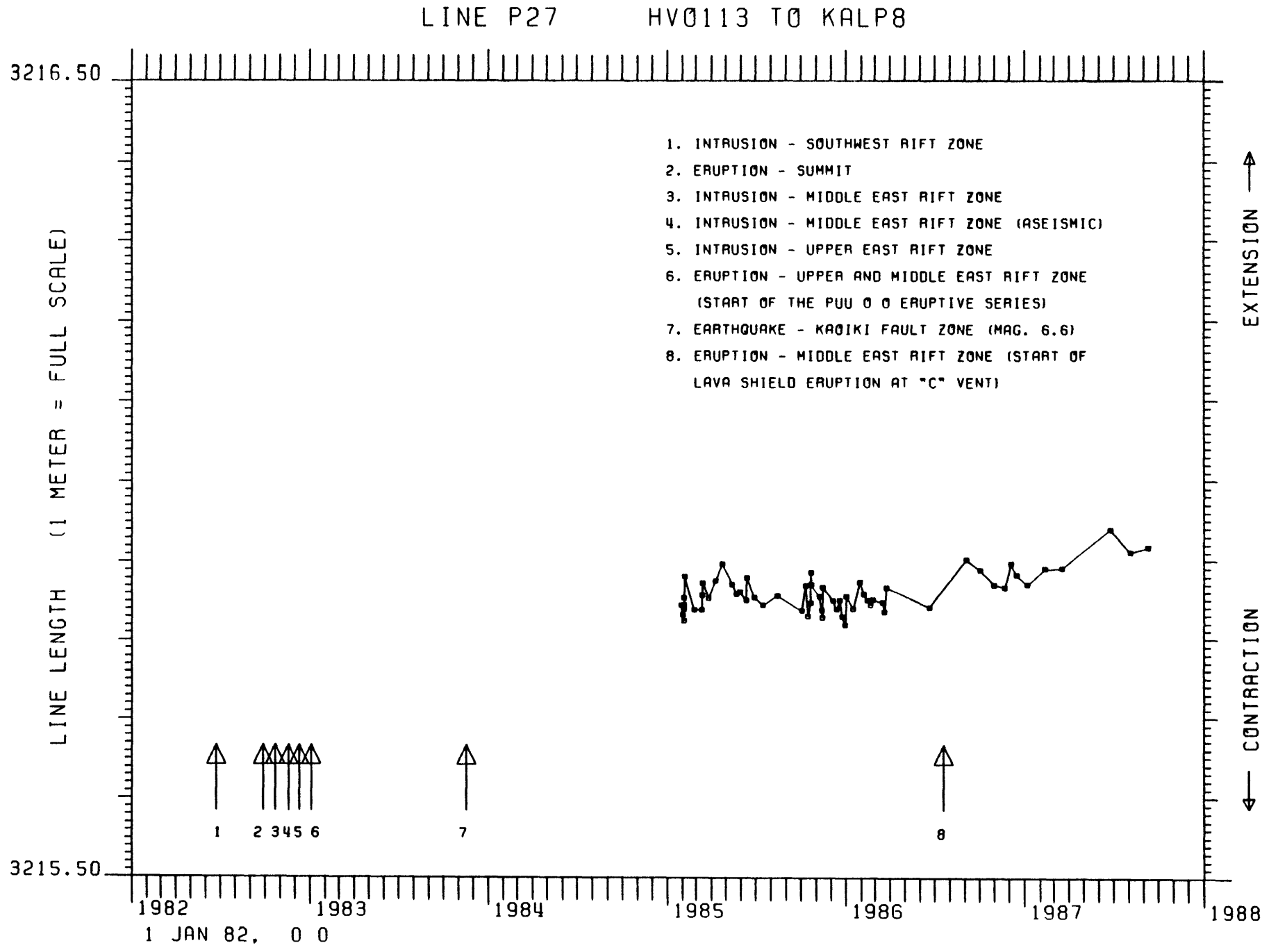
LINE P27 HV0113 TO KALP8
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3215.50
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
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4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
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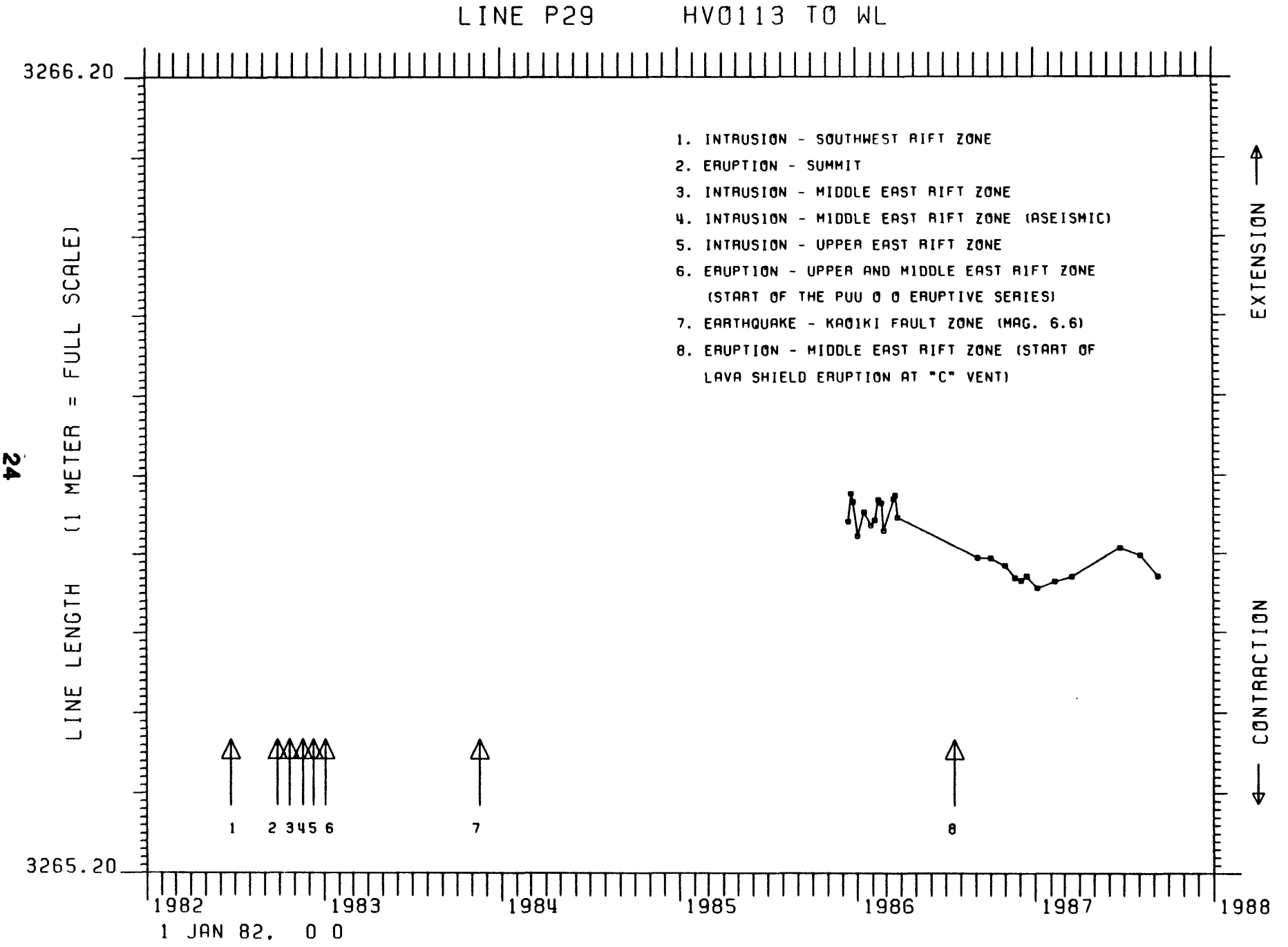
KILAUEA SUMMIT QUADRILATERAL MONITOR
INDIVIDUAL LINE LENGTH TIME SERIES PLOTS


LINE P29 HV0113 TO WL
3266.20
3265.20
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
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2. ERUPTION - SUMMIT
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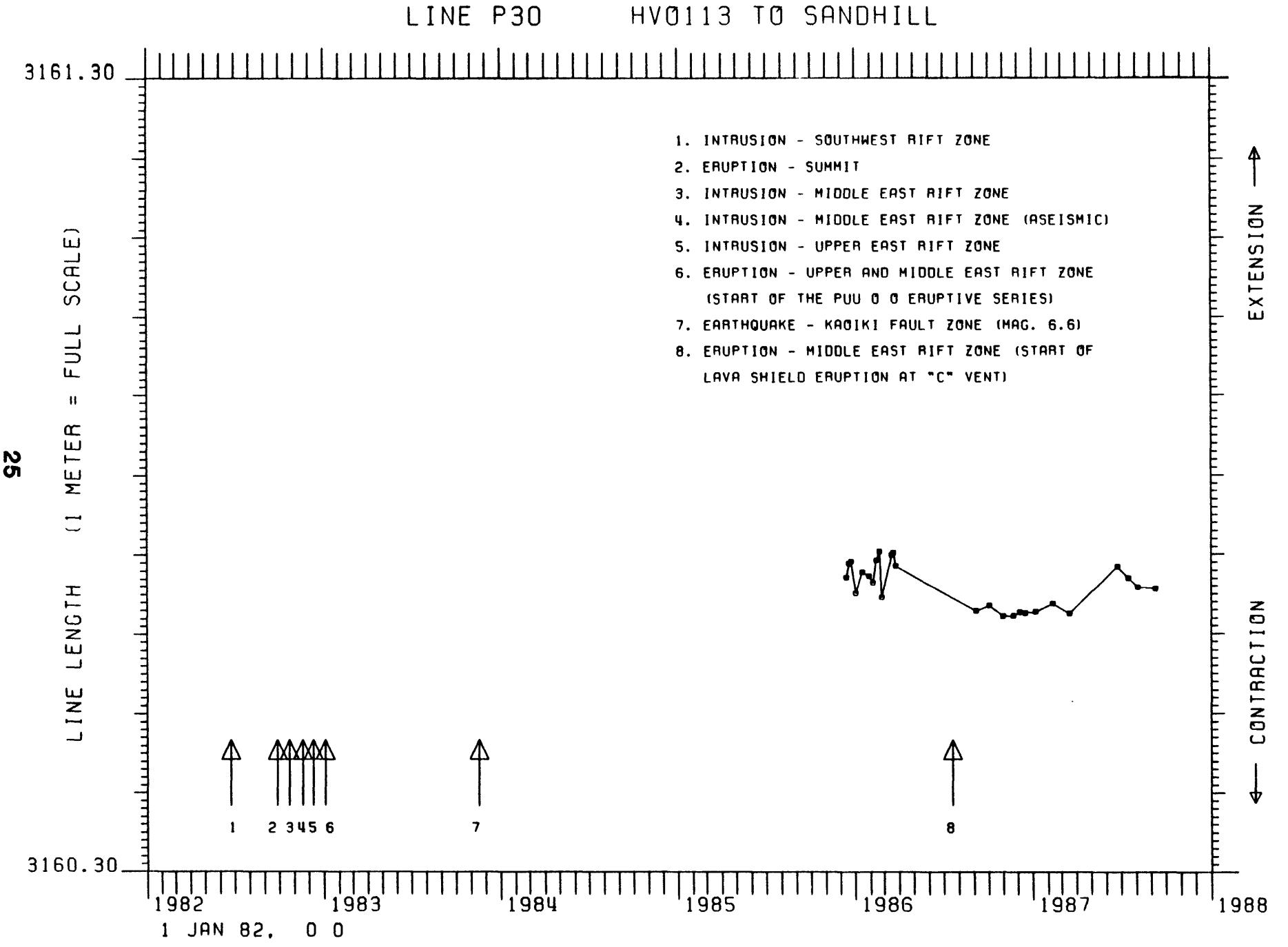
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3161.30
3160.30
LINE LENGTH (1 METER = FULL SCALE)
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2. ERUPTION - SUMMIT
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4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
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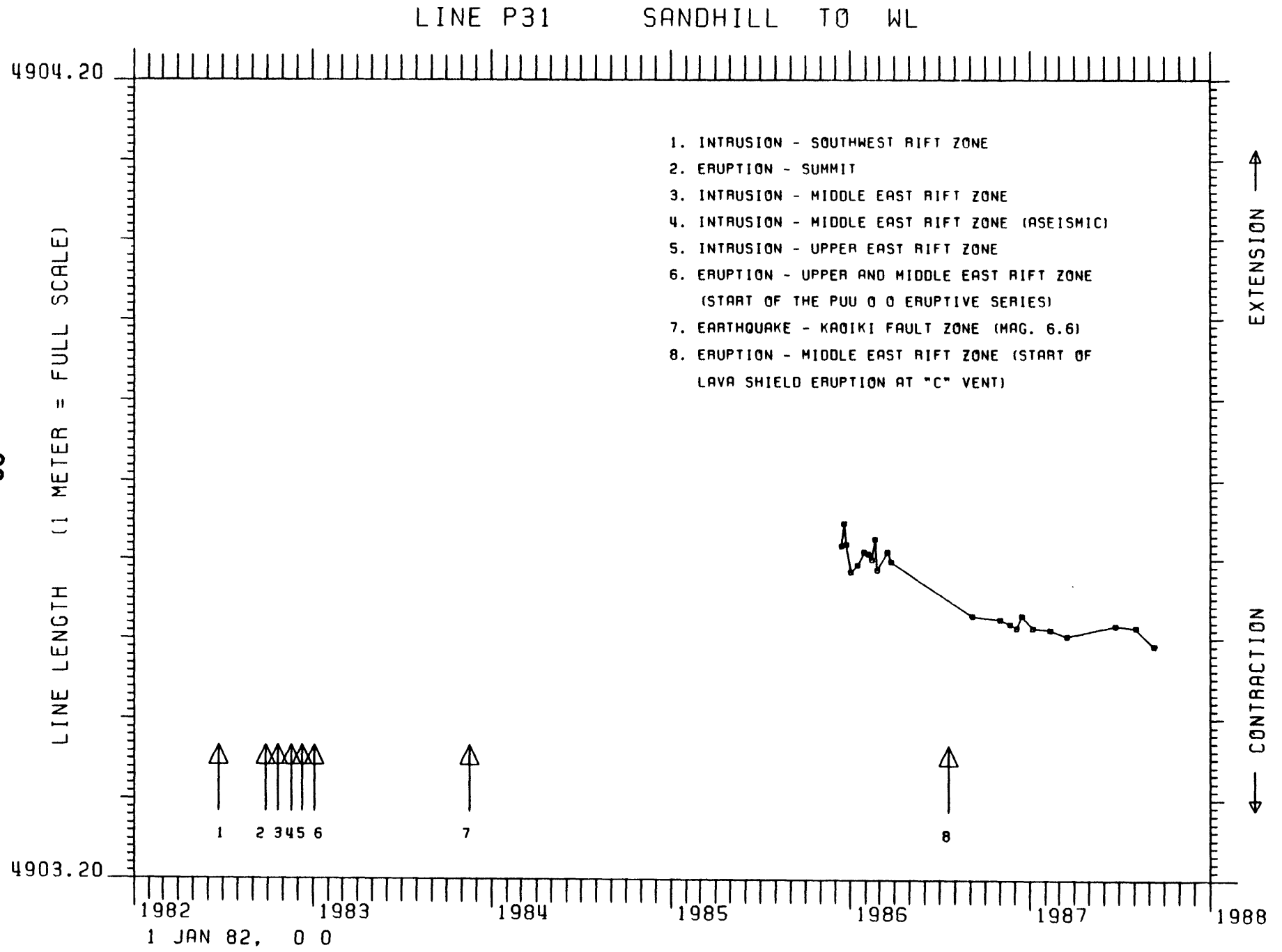
LINE P31 SANDHILL TO WL
4904.20
4903.20
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
1 2 3 4 5 6
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1982
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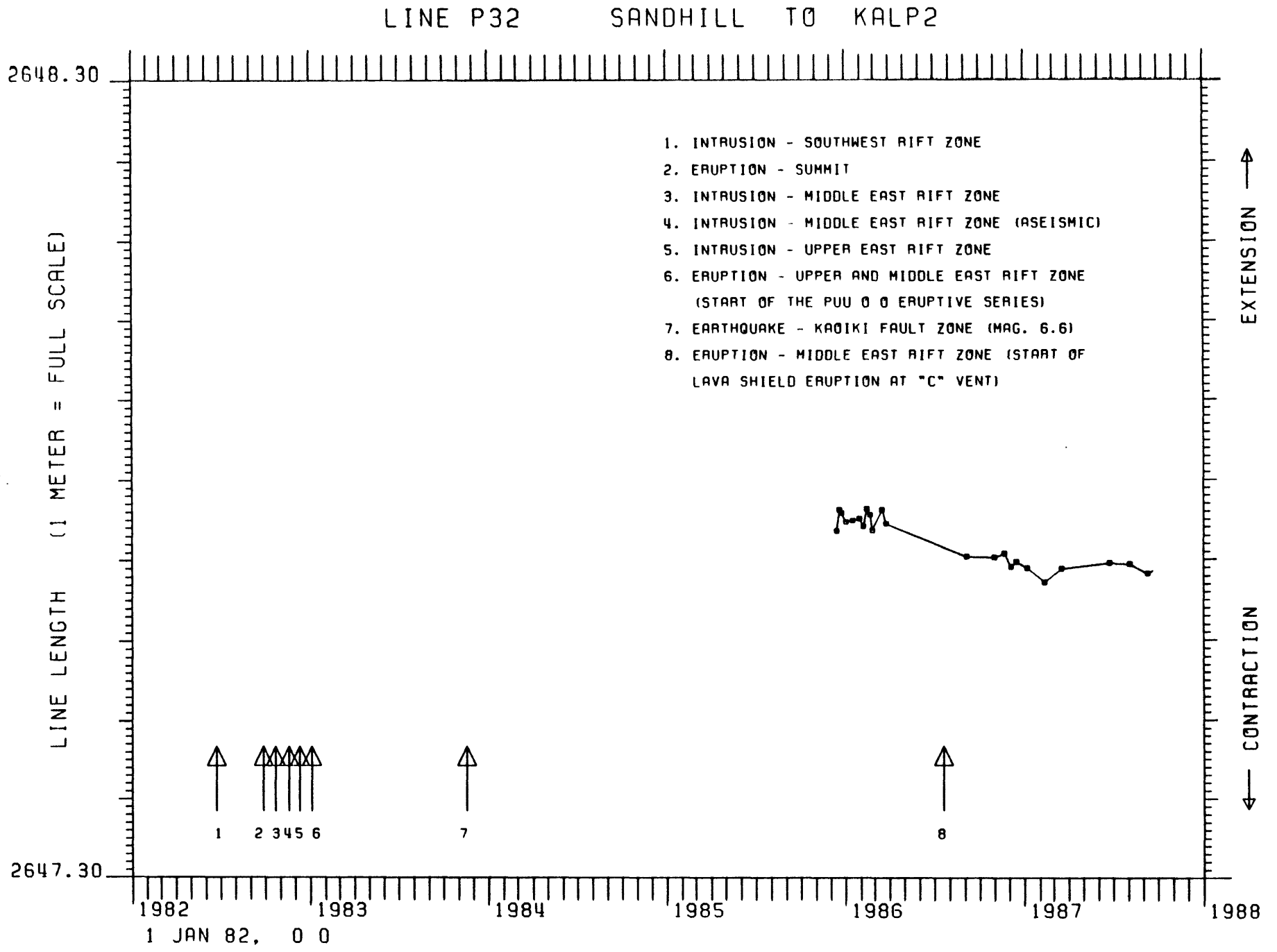
1988
1 JAN 82, 0 0


LINE P32 SANDHILL TO KALP2
2648.30
2647.30
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1
2 3 4 5 6
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1982
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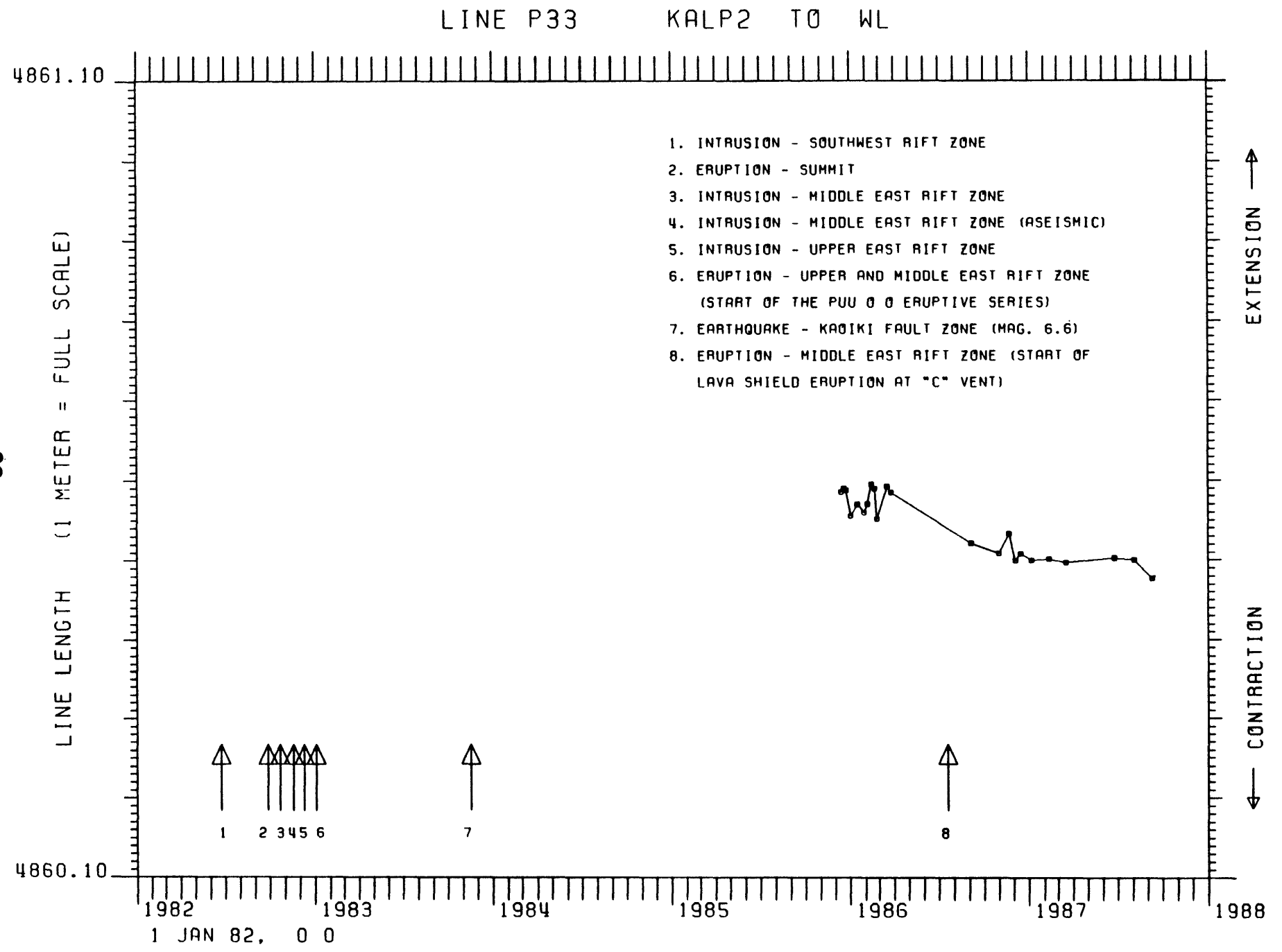
1 JAN 82, 0 0


LINE P33 KALP2 TO WL
4861.10
4860.10
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
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2 3 4 5 6
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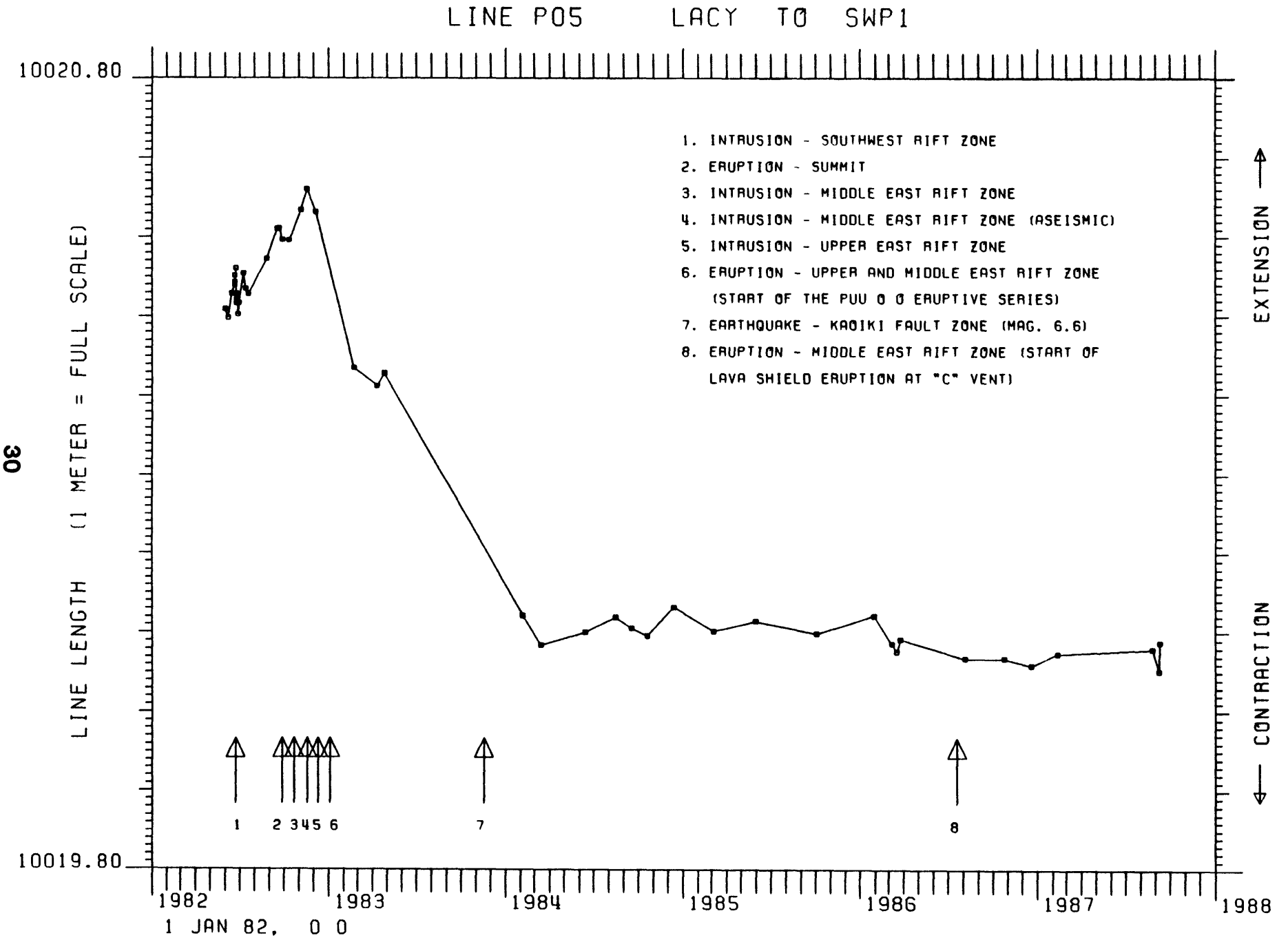
1 JAN 82, 0 0

KILAUEA UPPER SOUTHWEST RIFT ZONE MONITOR
INDIVIDUAL LINE LENGTH TIME SERIES PLOTS


LINE P05 LACY TO SWP1
10020.80
10019.80
LINE LENGTH (1 METER = FULL SCALE)
30
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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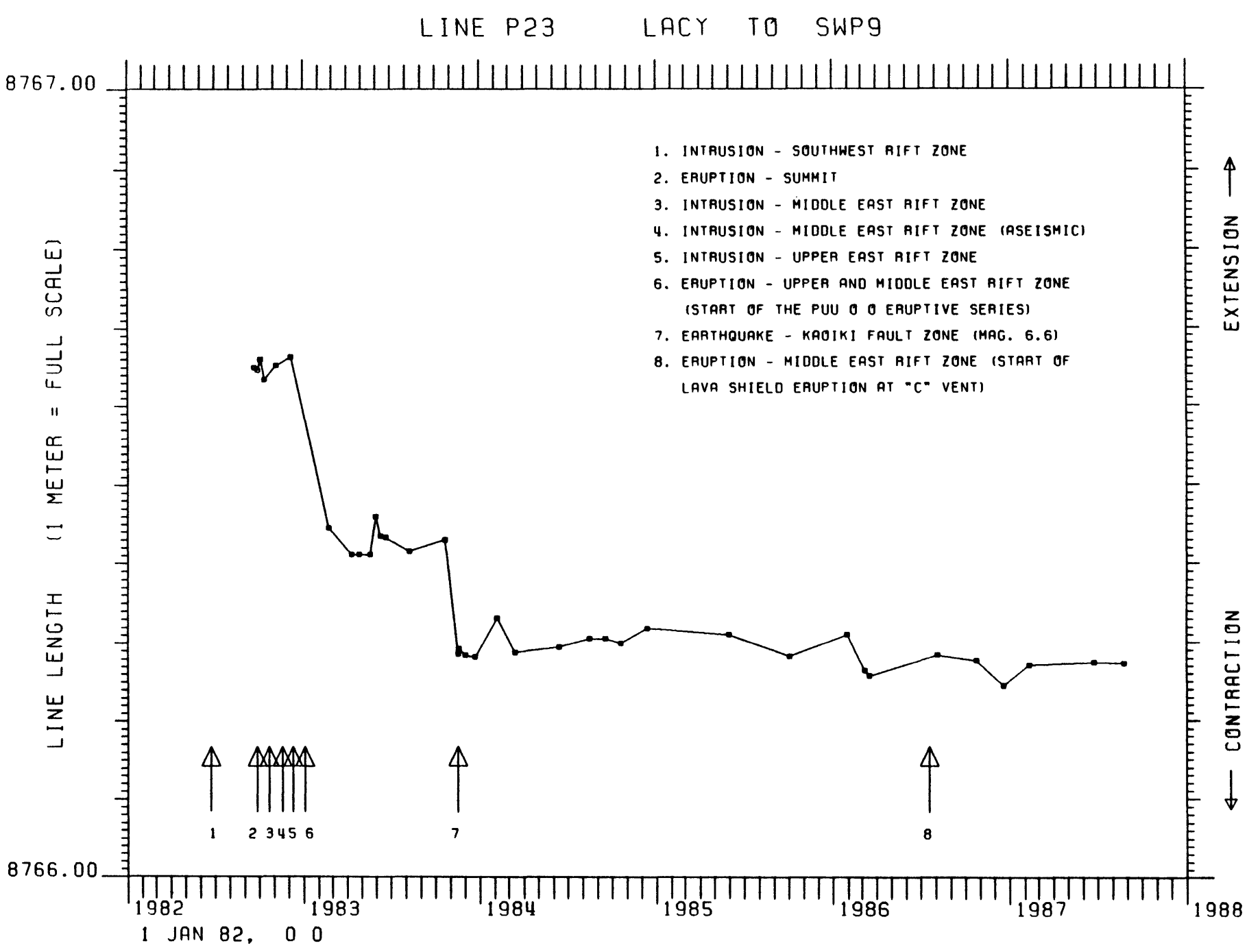
LINE P23 LACY TO SWP9
8767.00
8766.00
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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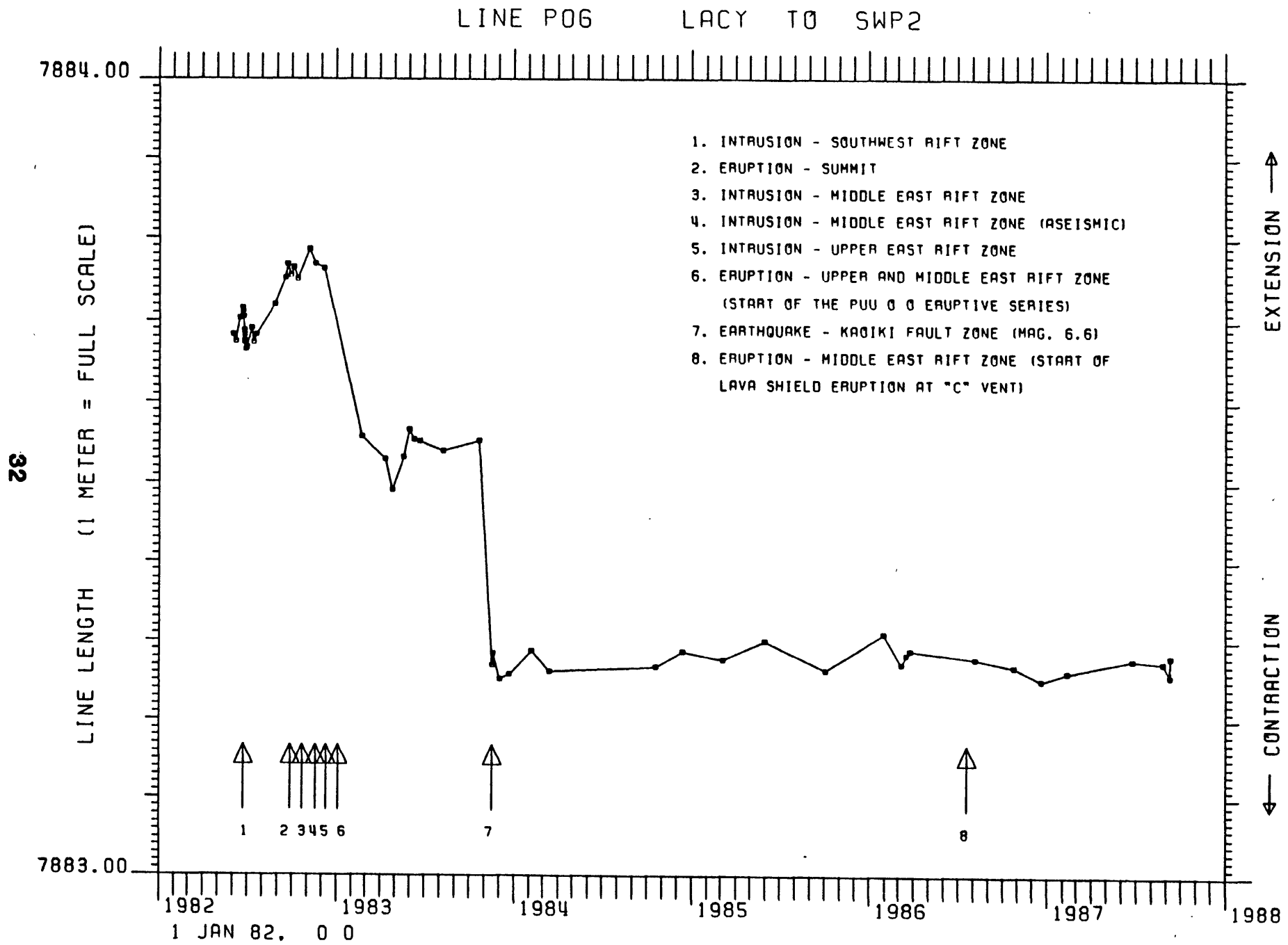
LINE P06 LACY TO SWP2
7884.00
7883.00
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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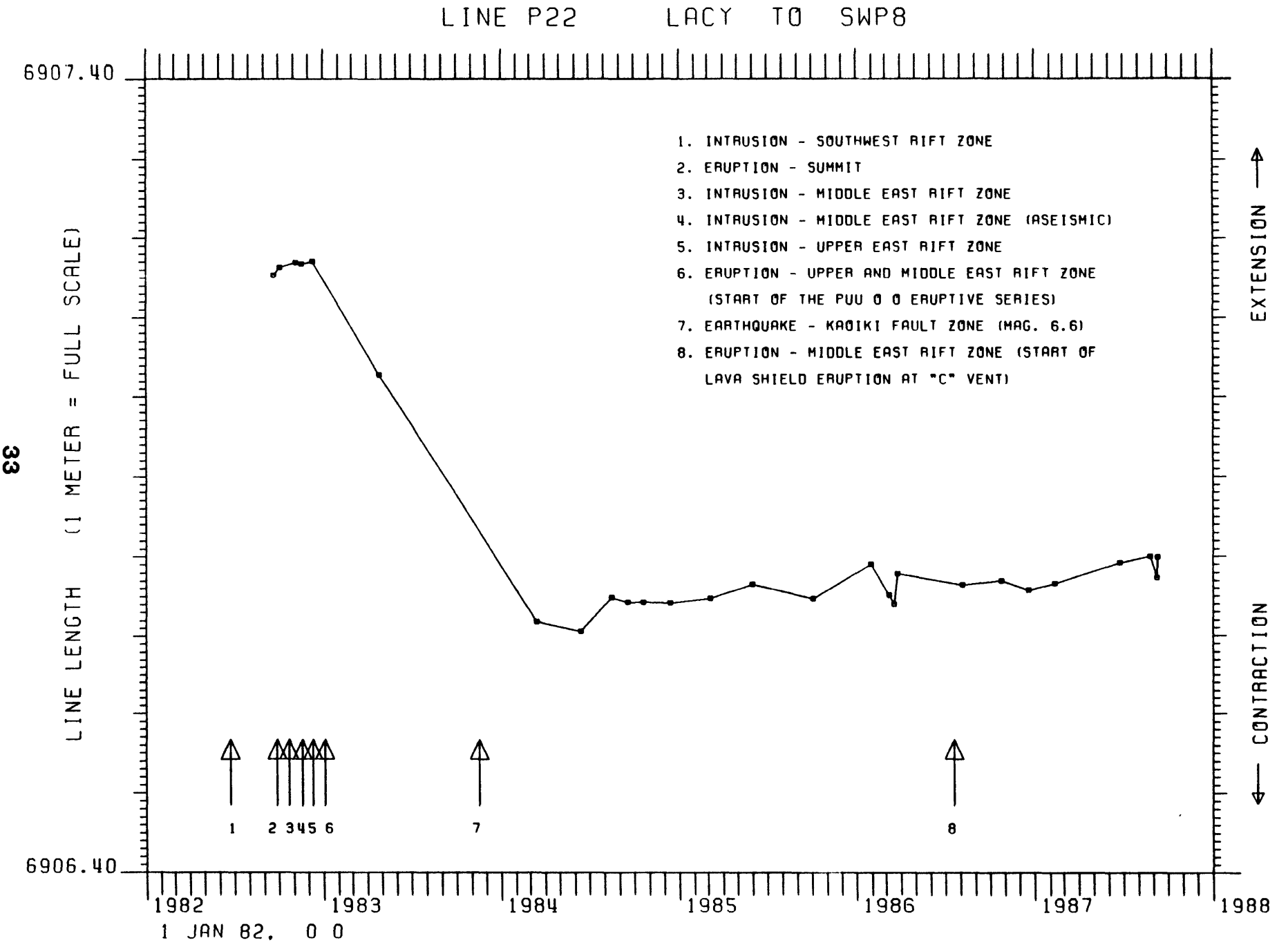
LINE P22 LACY TO SWP8
6907.40
6906.40
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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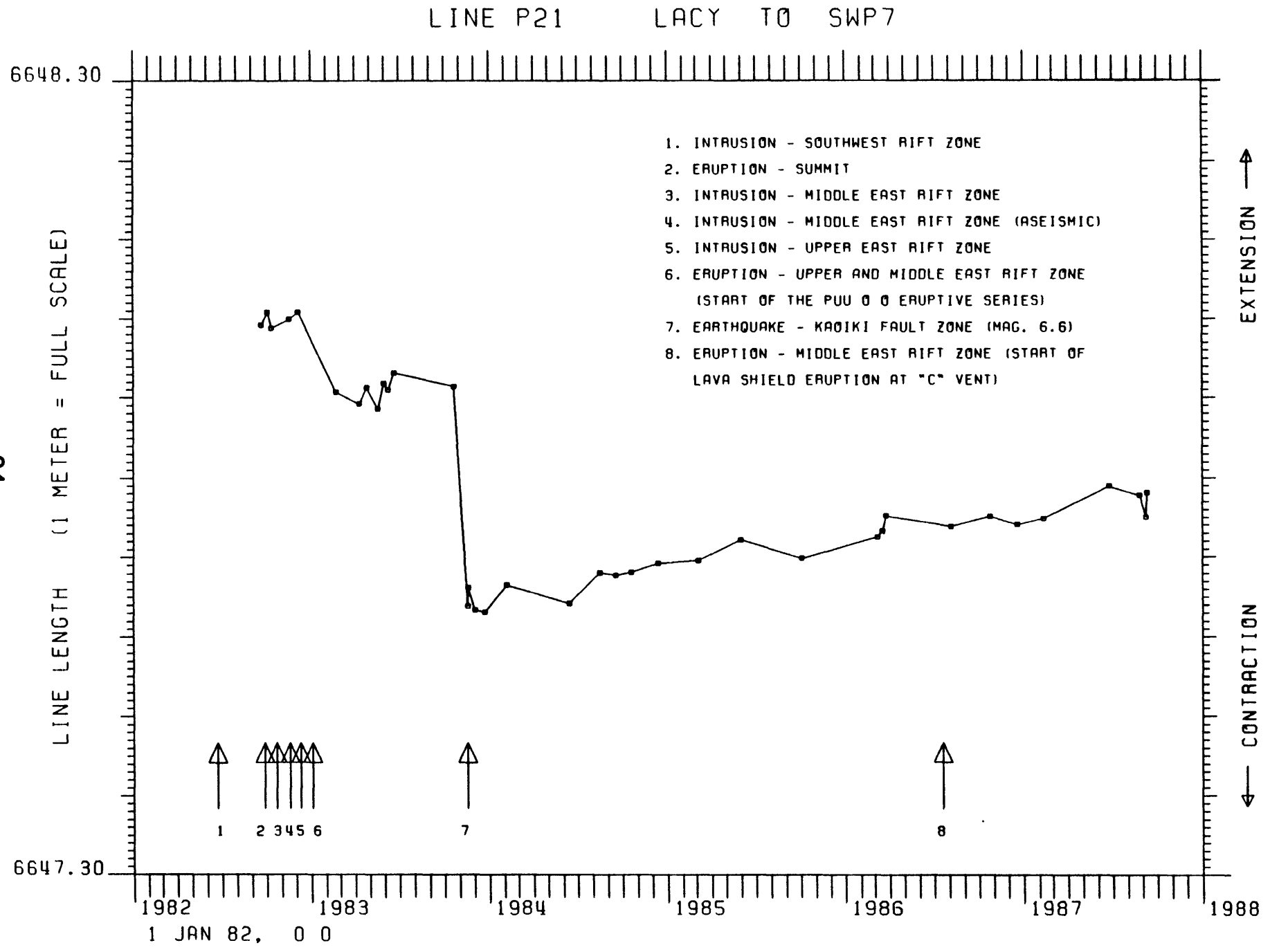
LINE P21 LACY TO SWP7
6648.30
6647.30
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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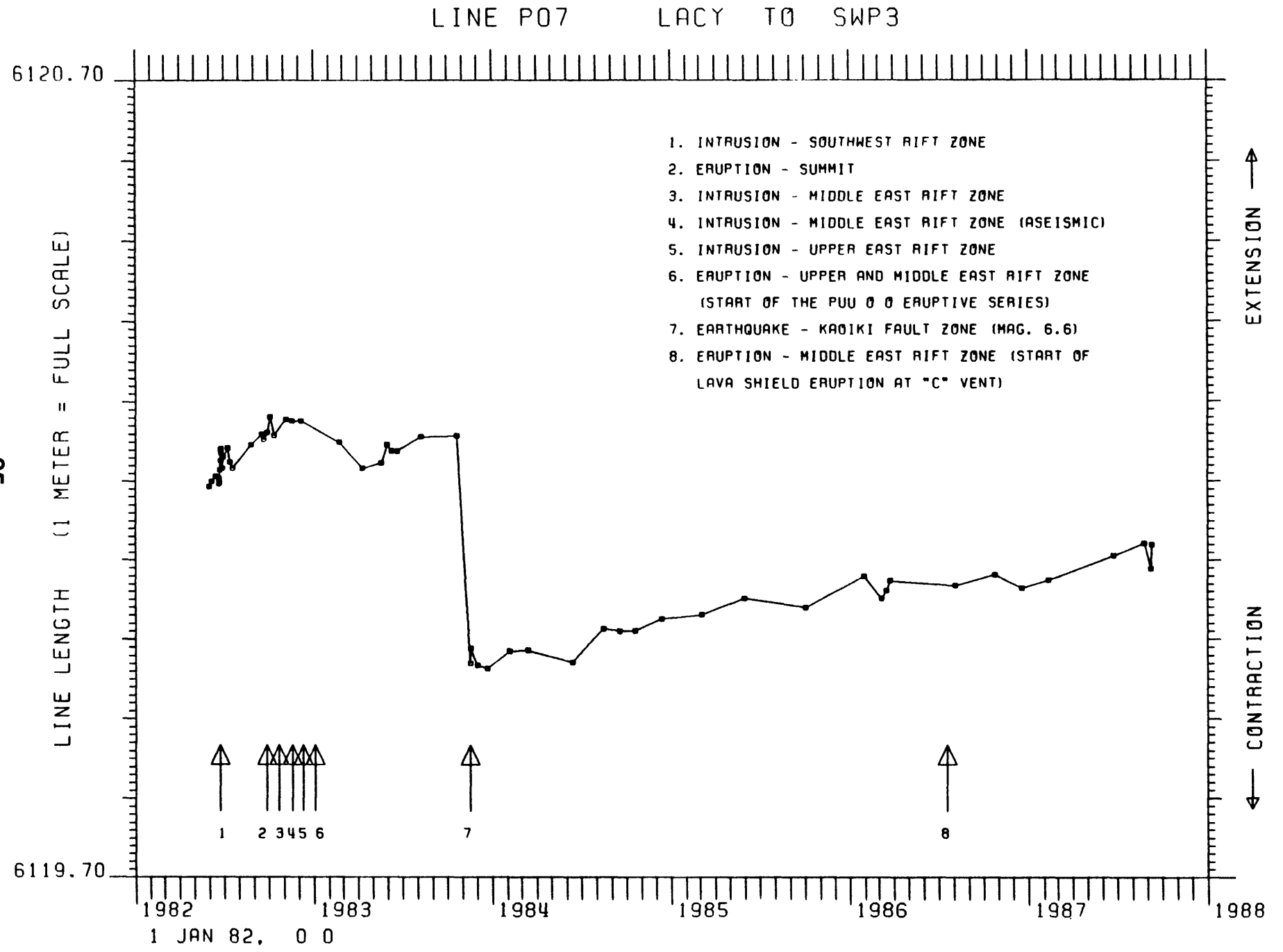
LINE P07 LACY TO SWP3
6120.70
6119.70
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
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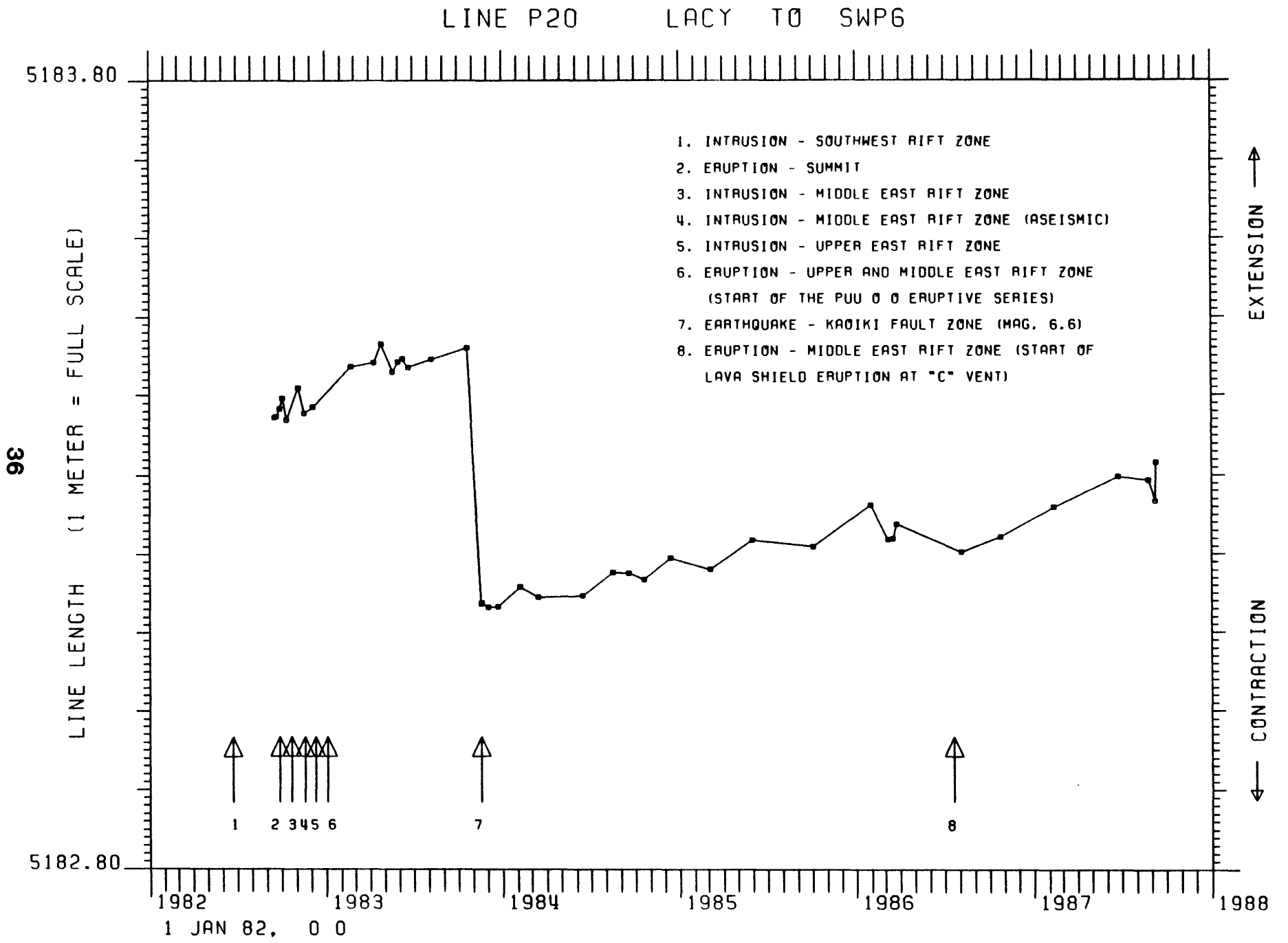
LINE P20 LACY TØ SWP6
5183.80
5182.80
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU Ø Ø ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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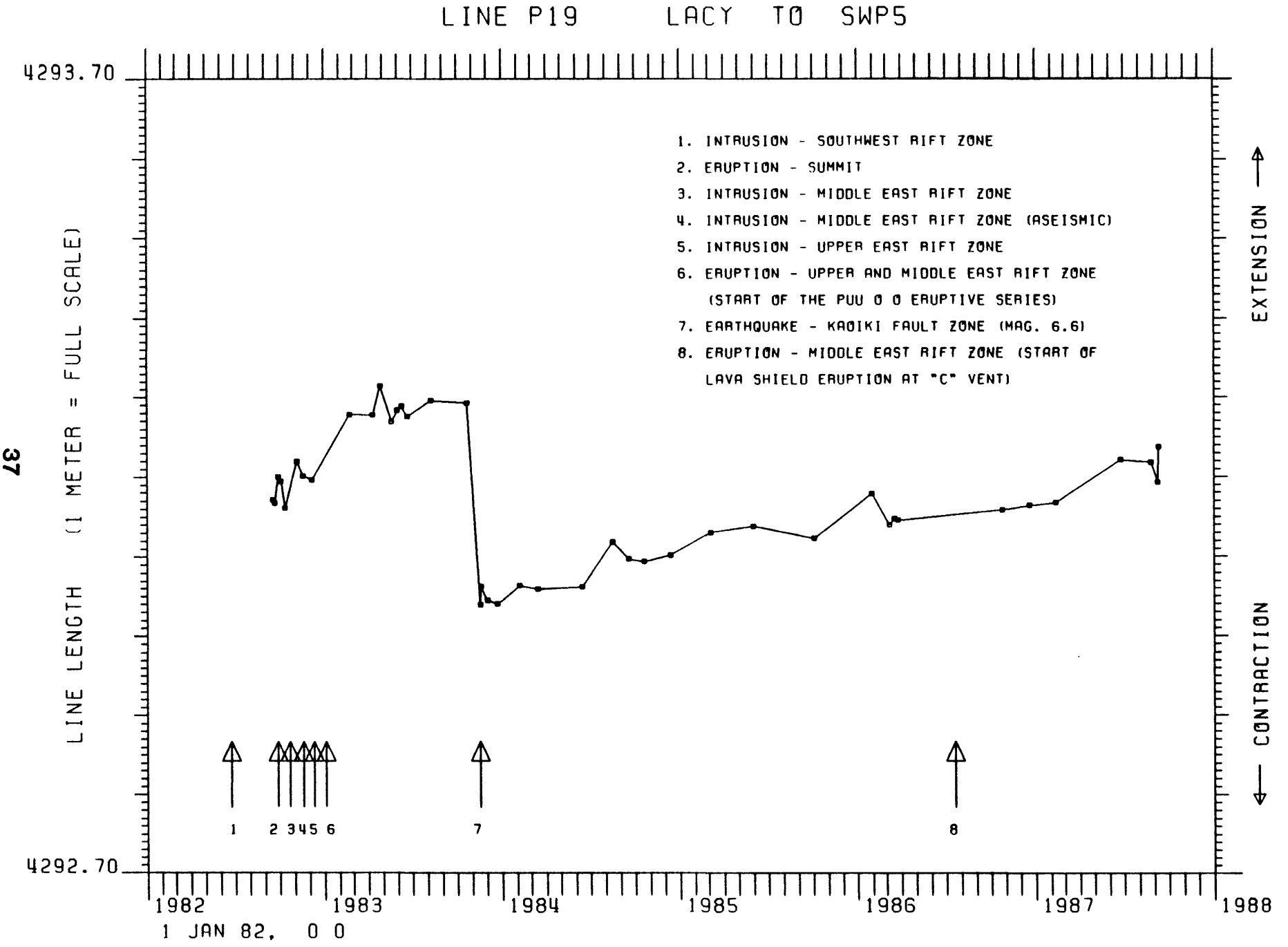
1 JAN 82, 0 0


LINE P19 LACY TO SWP5
4293.70
4292.70
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
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2 345 6
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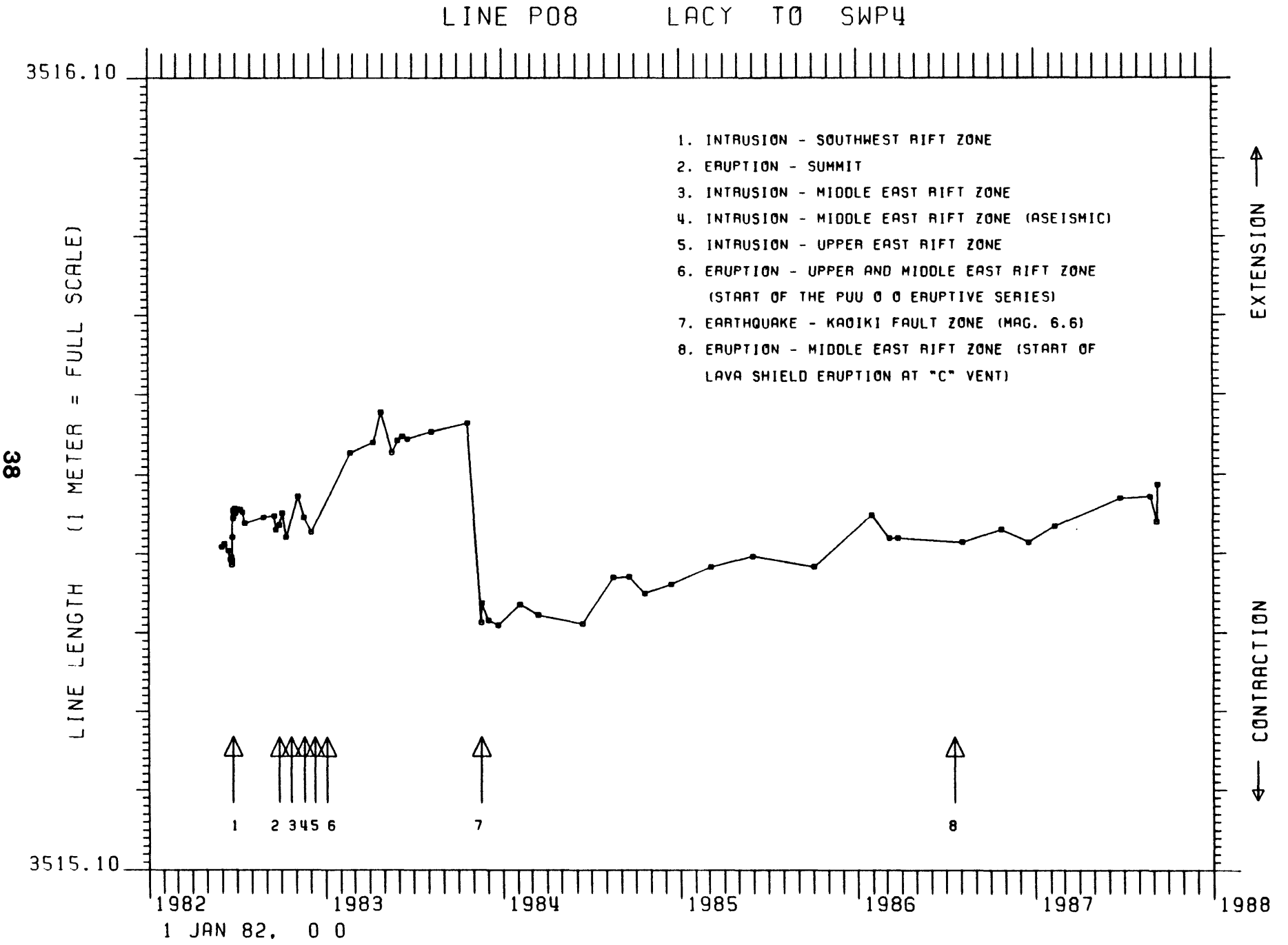
1987
1988
1 JAN 82, O O


LINE P08 LACY TO SWP4
3516.10
3515.10
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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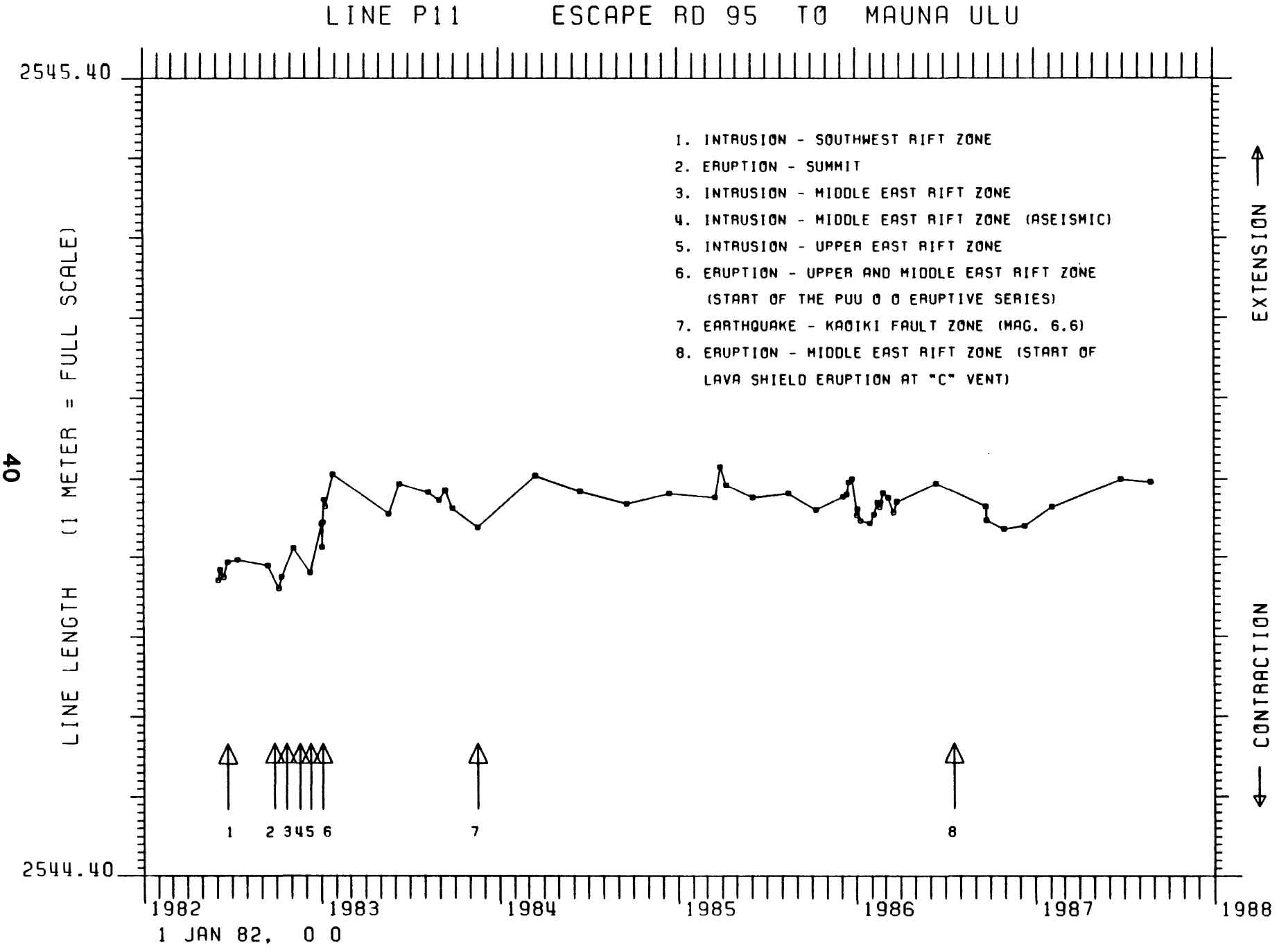
1 JAN 82, 0 0

KILAUEA UPPER EAST RIFT ZONE MONITOR
INDIVIDUAL LINE LENGTH TIME SERIES PLOTS


LINE P11 ESCAPE RD 95 TO MAUNA ULU
2545.40
2544.40
LINE LENGTH (1 METER = FULL SCALE)
40
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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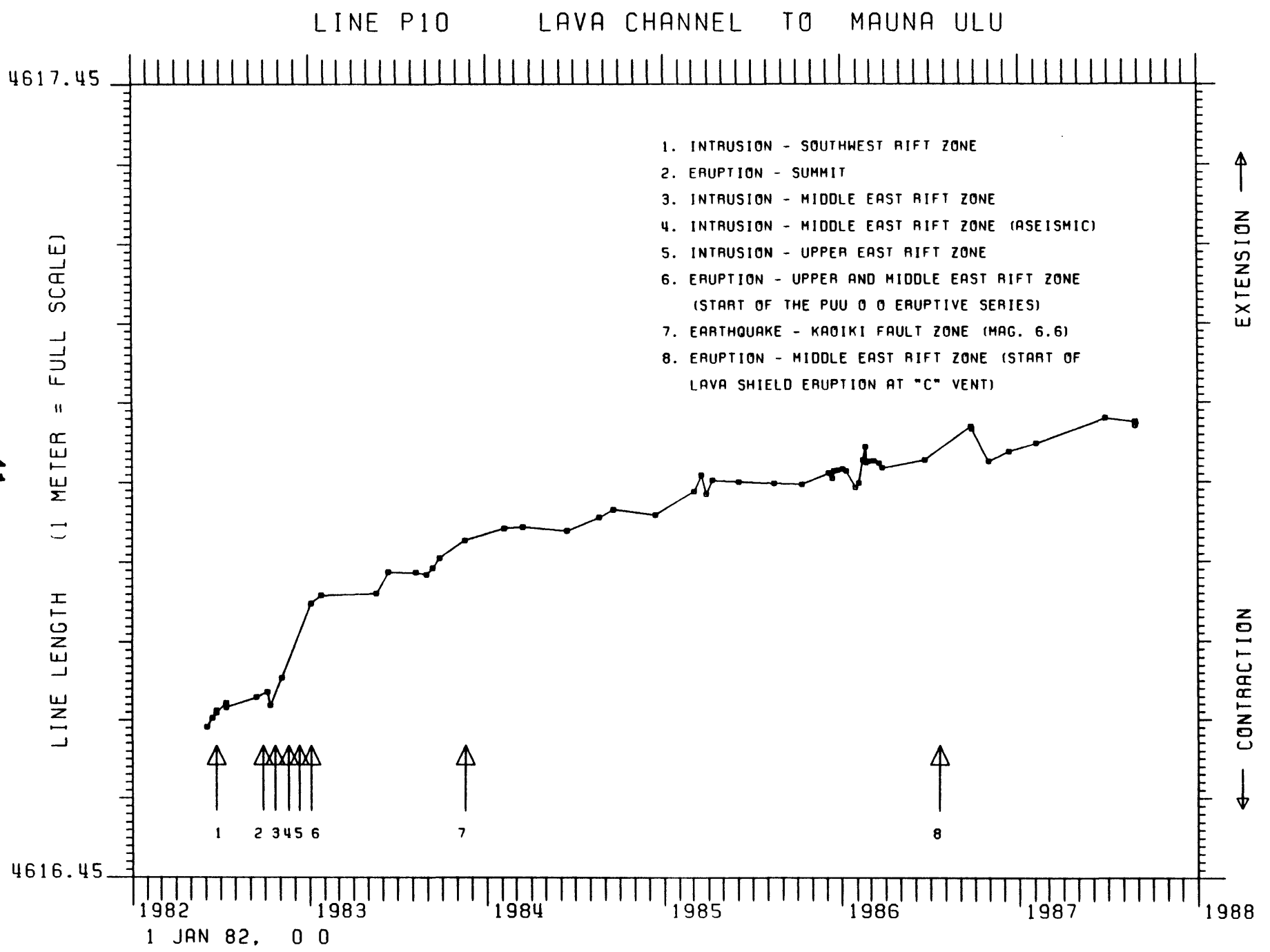
1 JAN 82, O O


LINE P10 LAVA CHANNEL TO MAUNA ULU
4617.45
4616.45
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1 2 3 4 5 6
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1982
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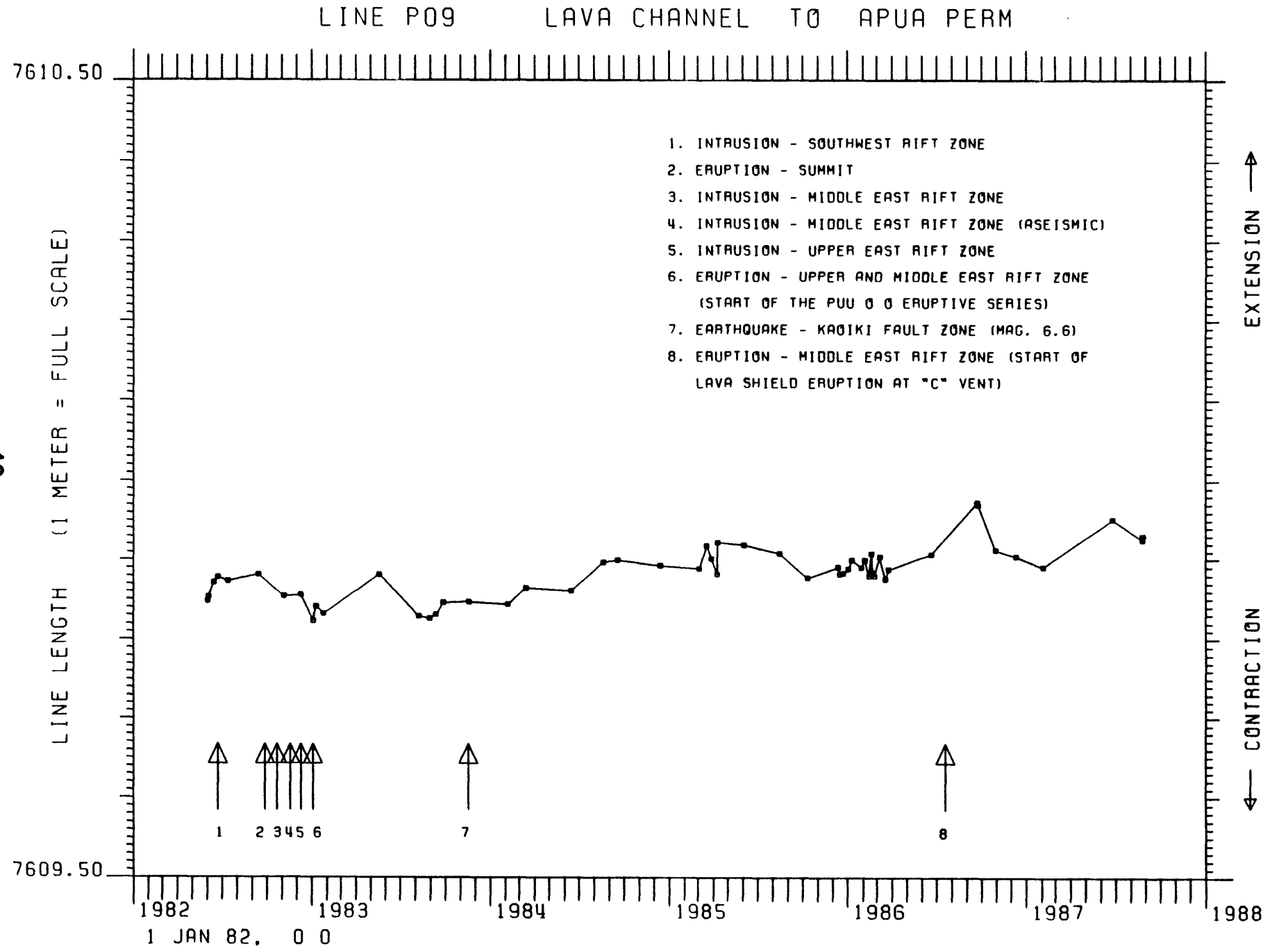
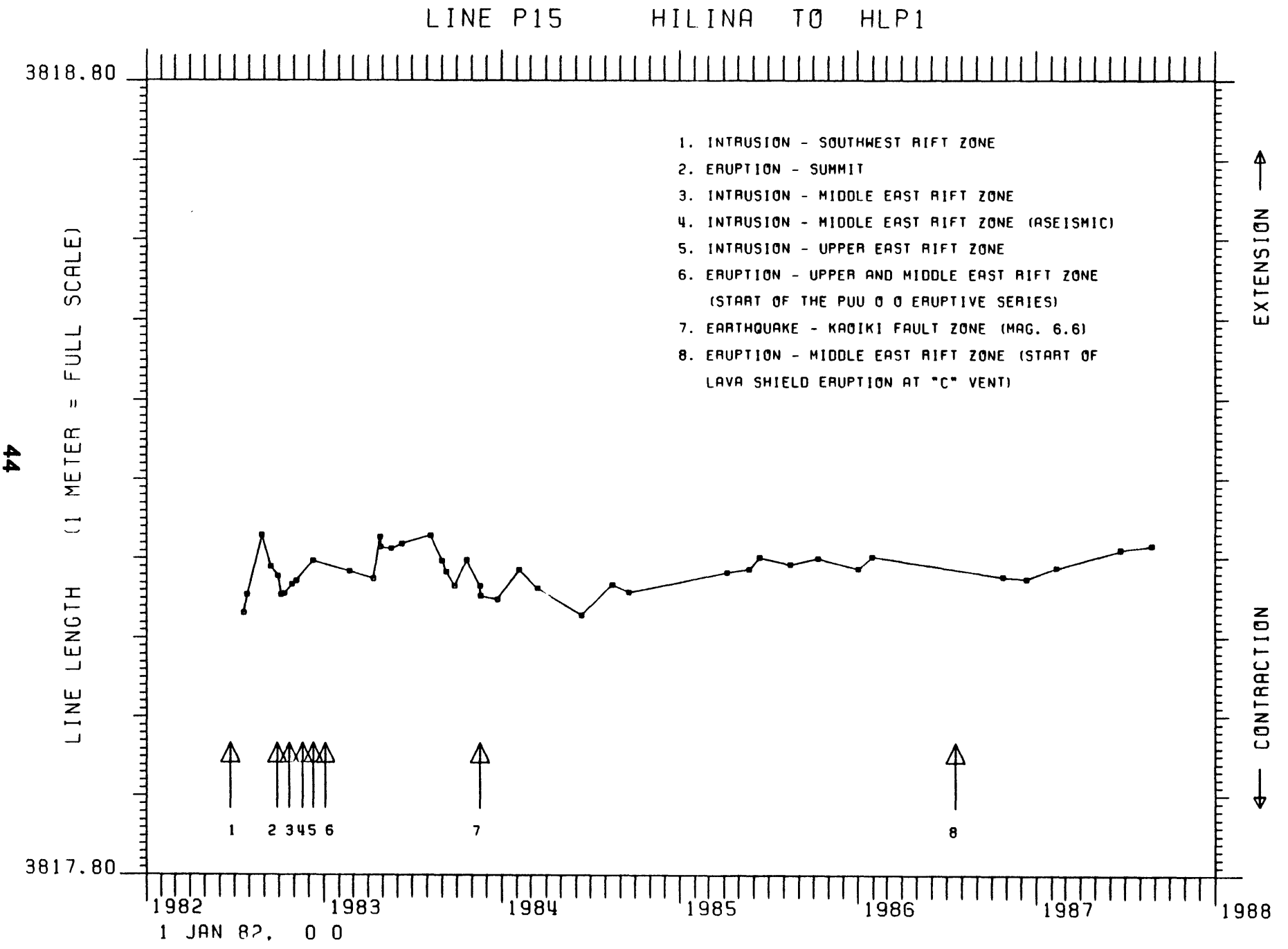
1 JAN 82, 0 0


LINE P09 LAVA CHANNEL TO APUA PERM
7610.50
7609.50
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1 2 3 4 5 6 7 8
1982 1983 1984 1985 1986 1987 1988
1 JAN 82, 0 0

KILAUEA SOUTH FLANK HILINA PALI MONITOR
INDIVIDUAL LINE LENGTH TIME SERIES PLOTS


LINE P15 HILINA TO HLP1
3818.80
3817.80
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
1
2 3 4 5 6
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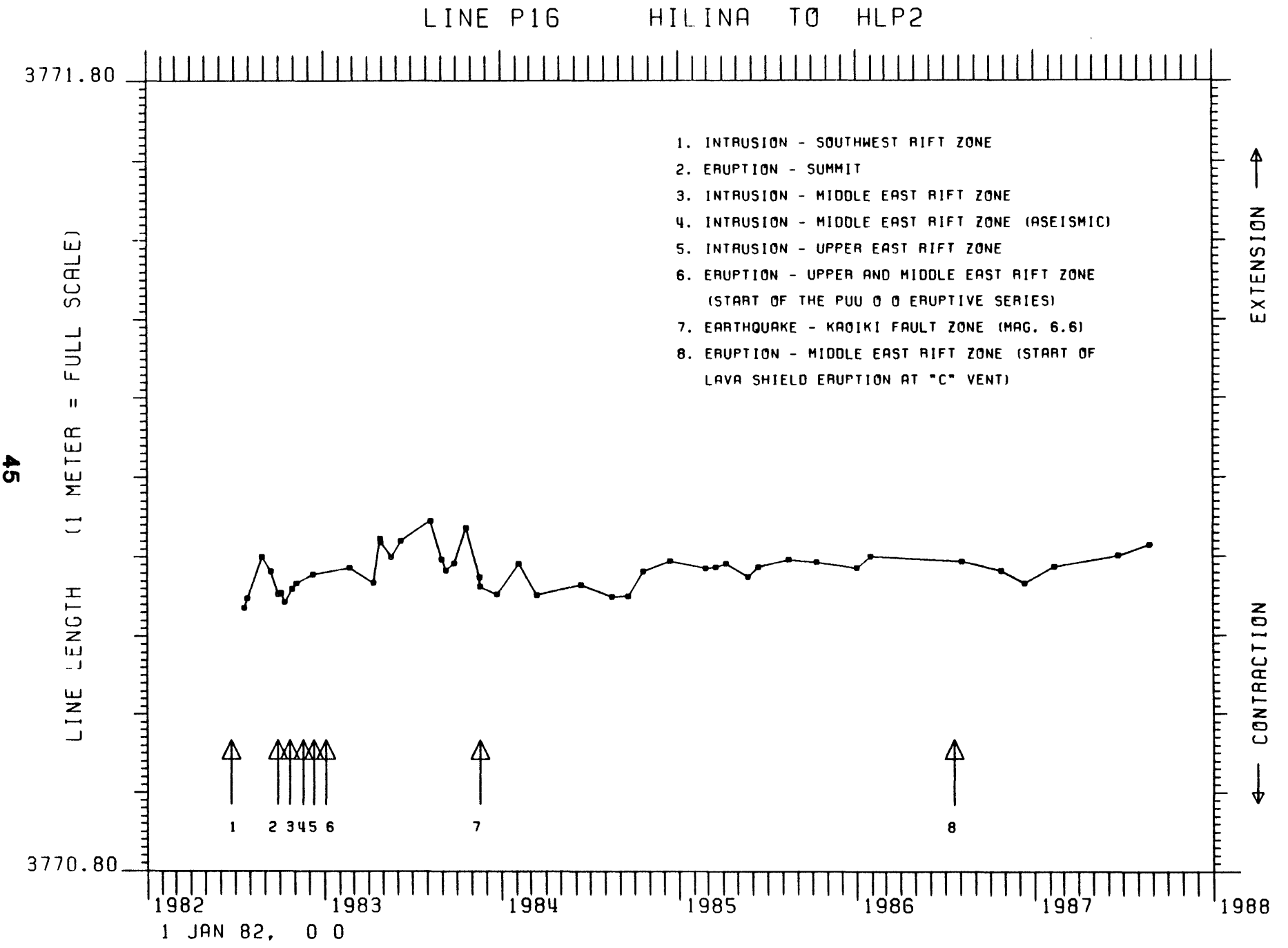
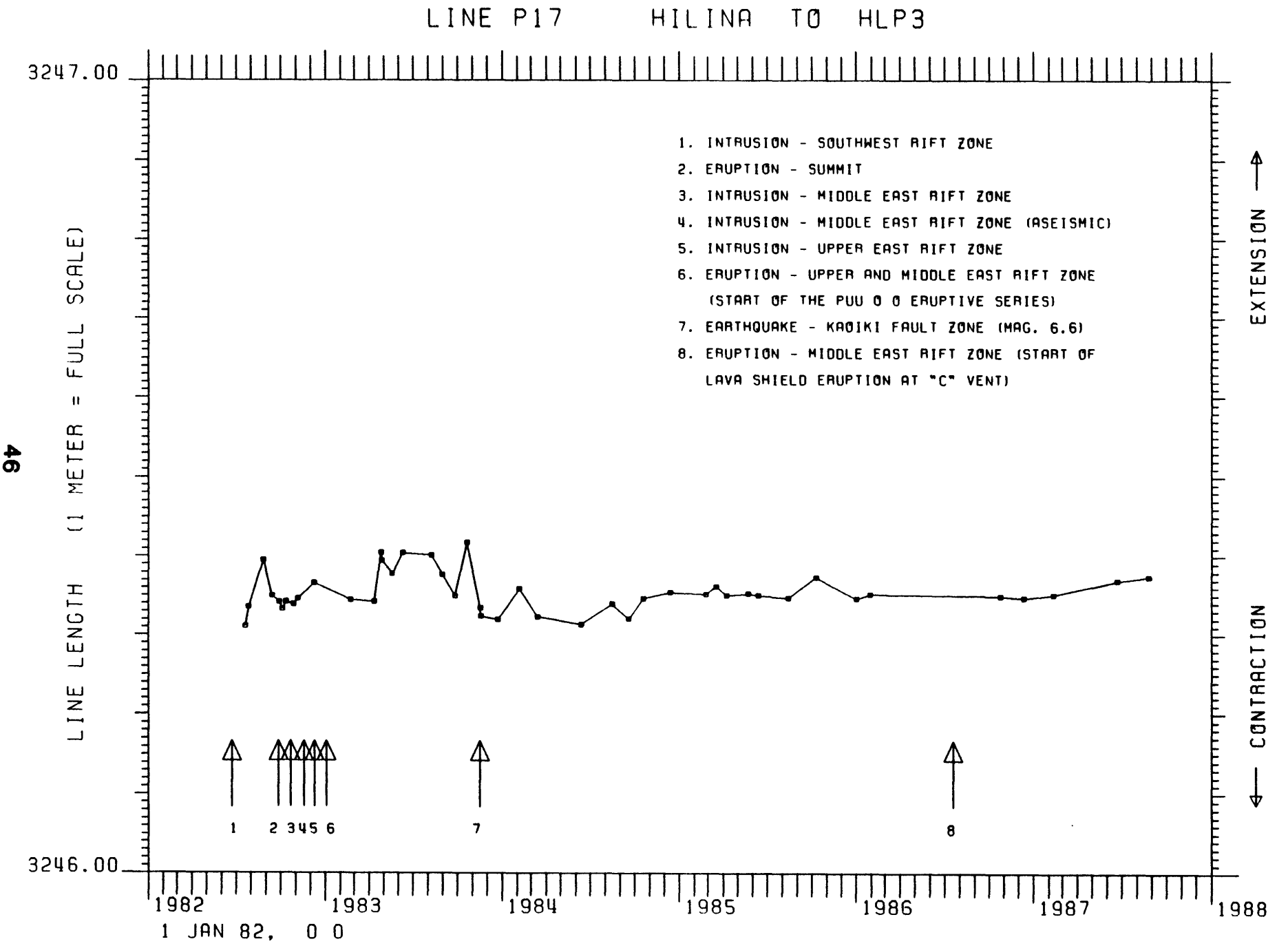
1 JAN 82, 0 0


LINE P16 HILINA TO HLP2
3771.80
3770.80
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1 2 3 4 5 6 7 8
1982 1983 1984 1985 1986 1987 1988
1 JAN 82, 0 0


LINE P17 HILINA TO HLP3
3247.00
3246.00
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
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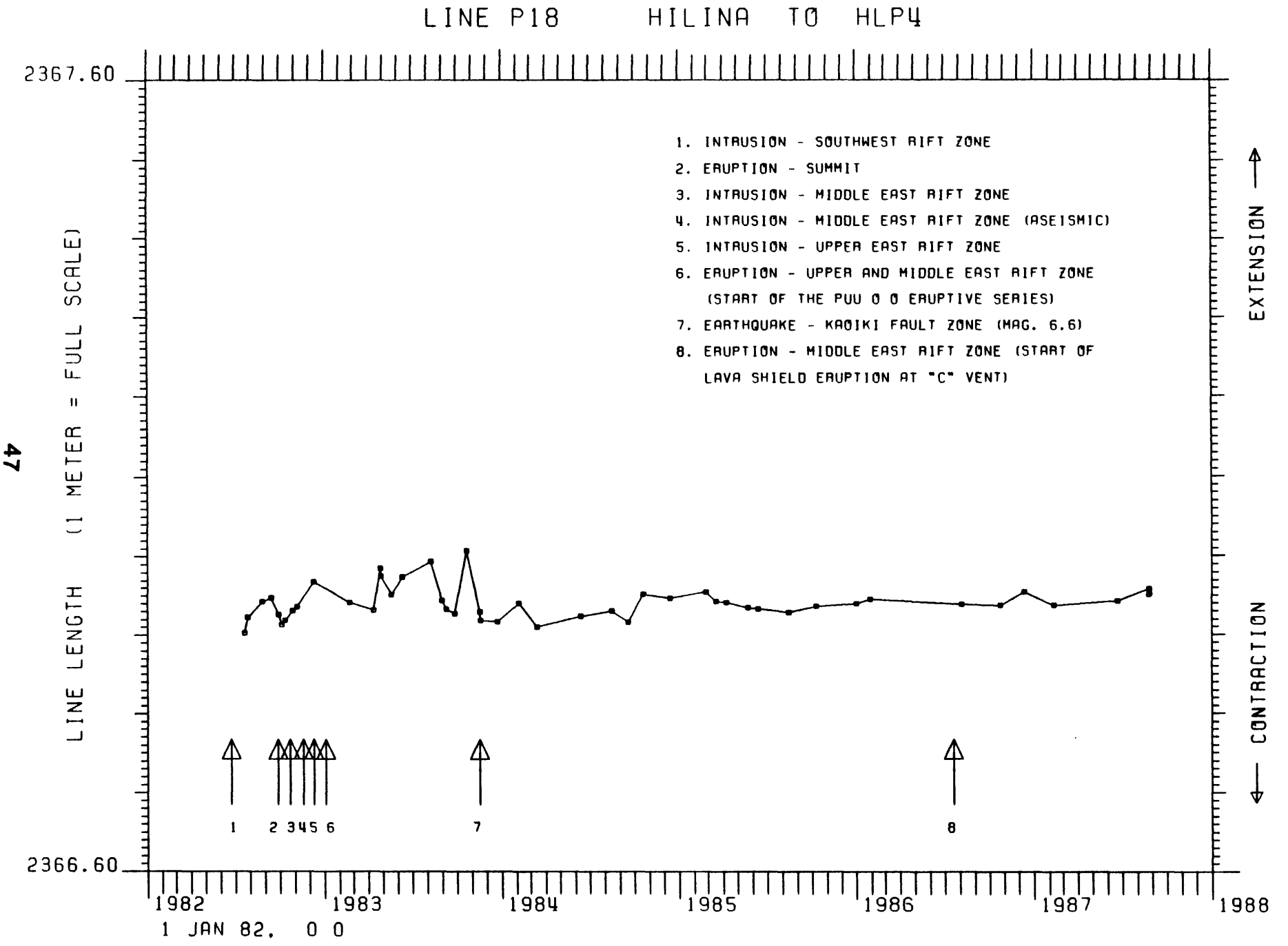
LINE P18 HILINA TO HLP4
2367.60
2366.60
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
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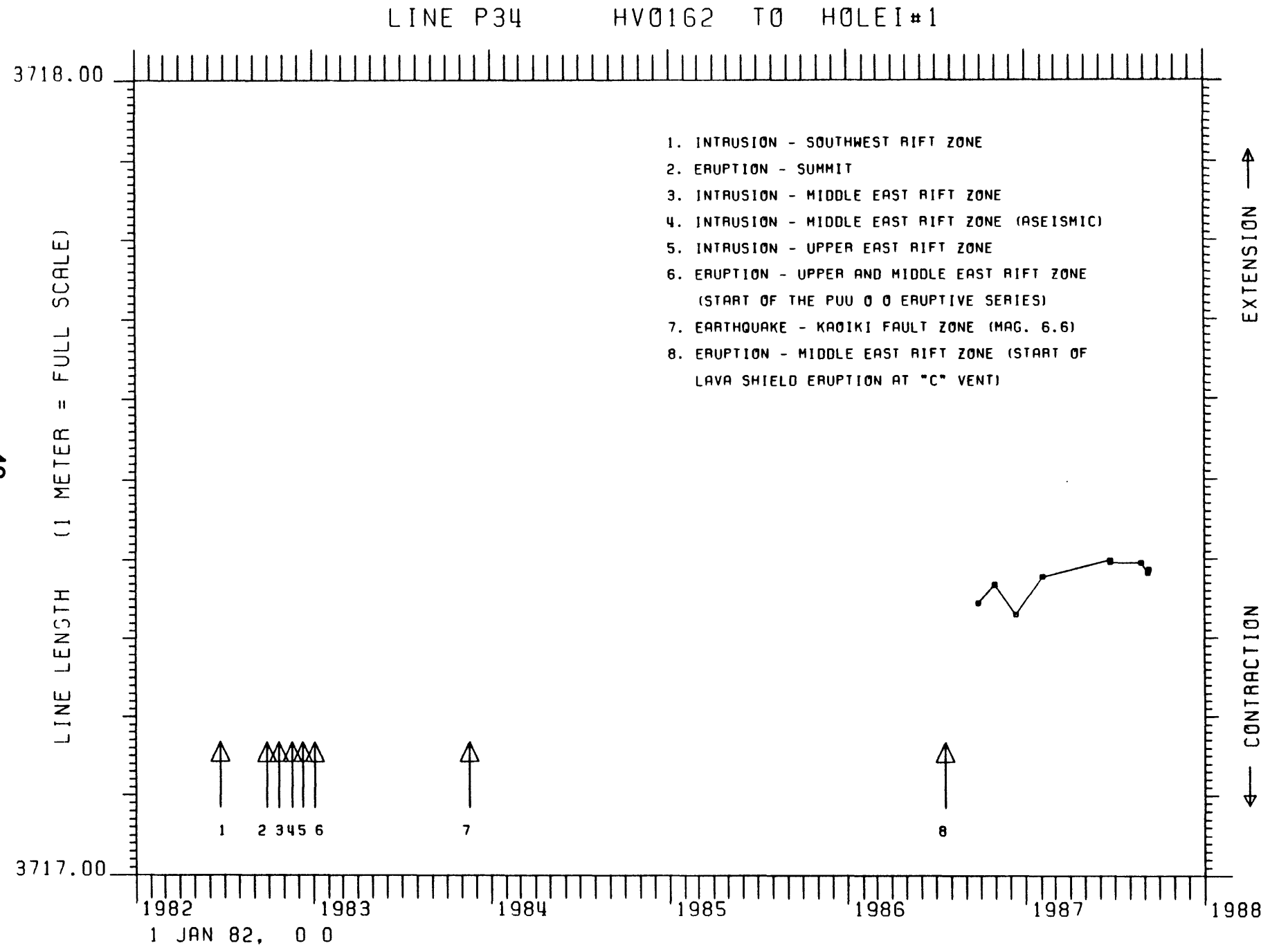
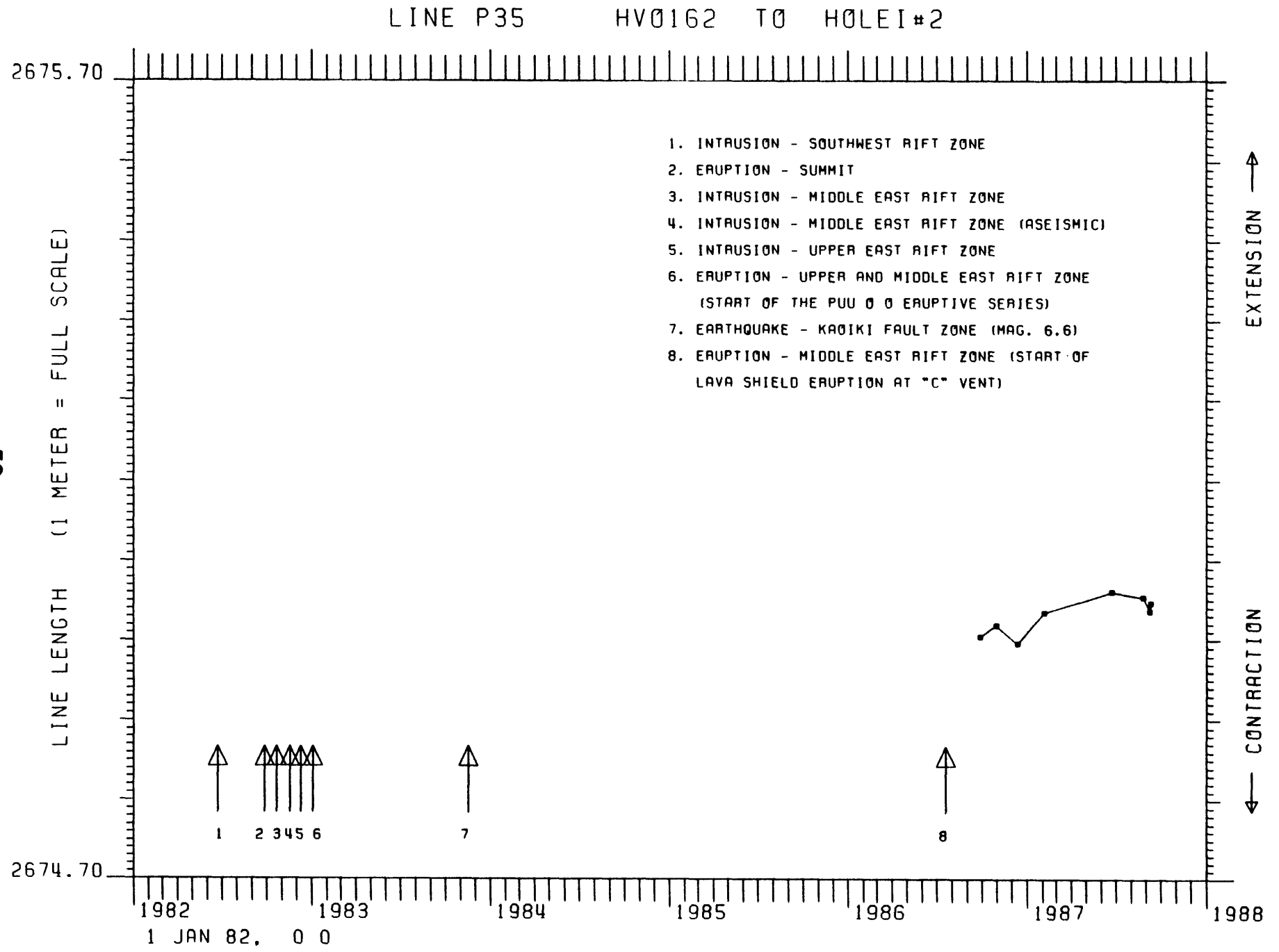
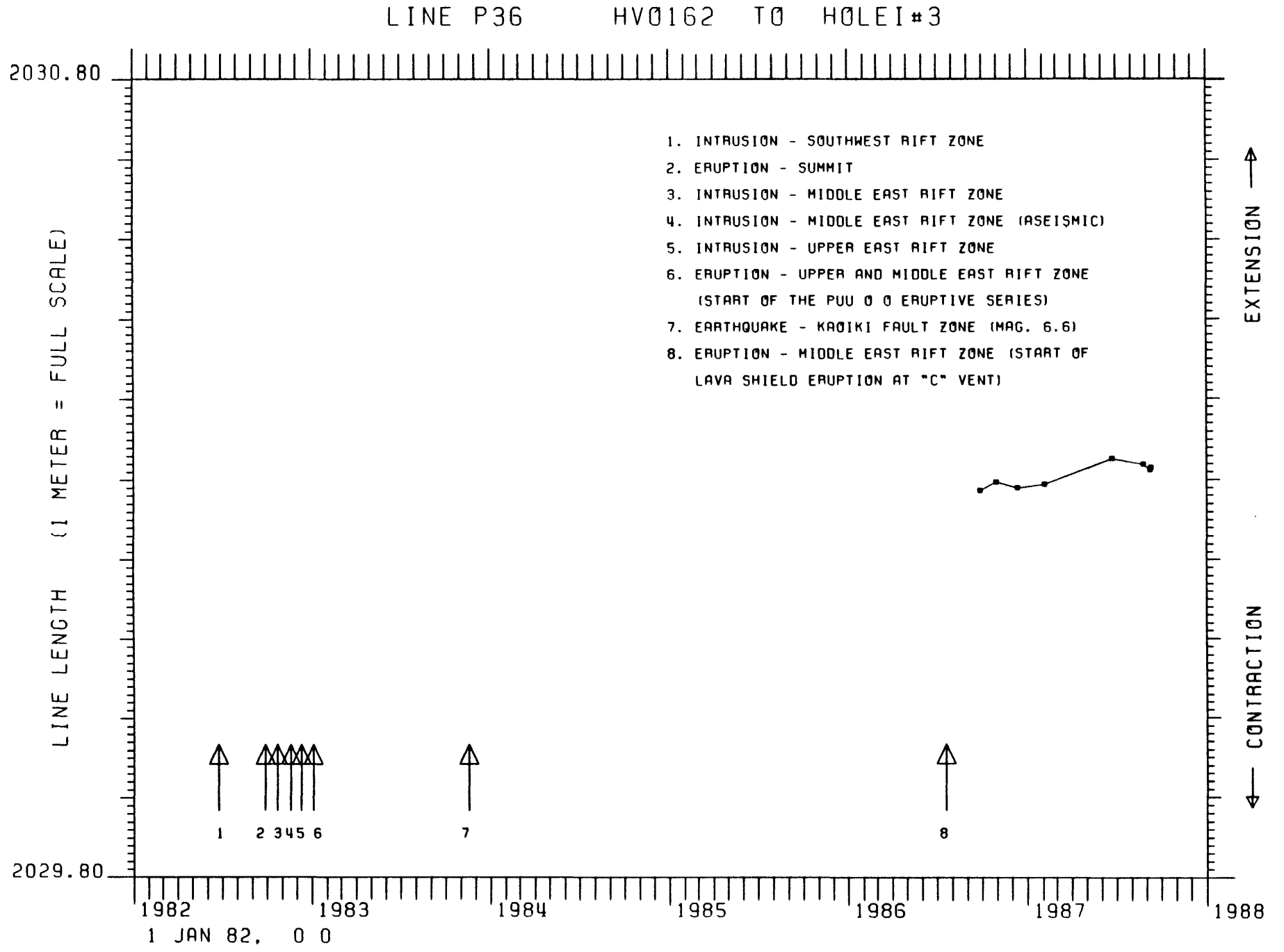
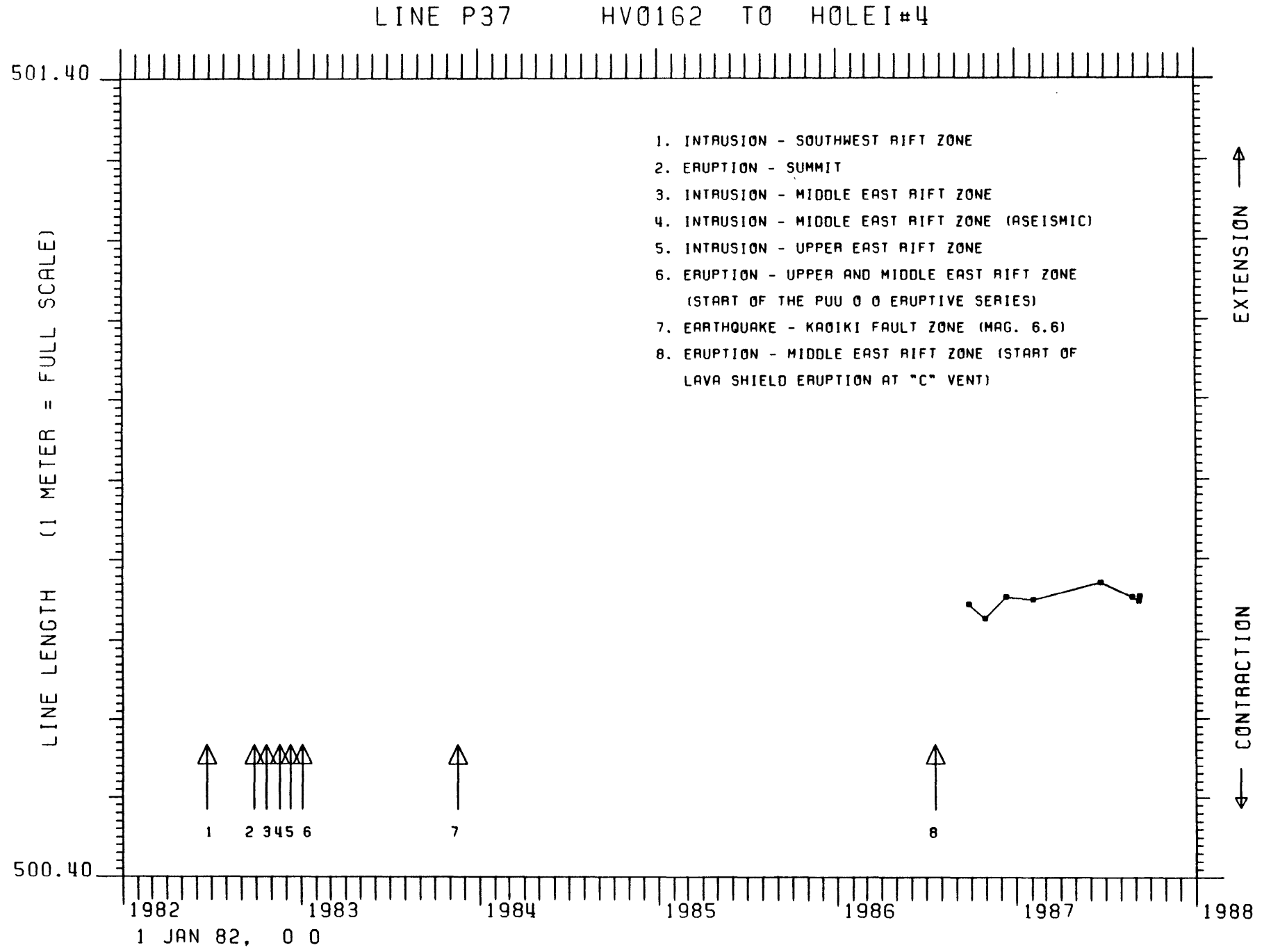
KILAUEA SOUTH FLANK HOLEI PALI MONITOR
INDIVIDUAL LINE LENGTH TIME SERIES PLOTS

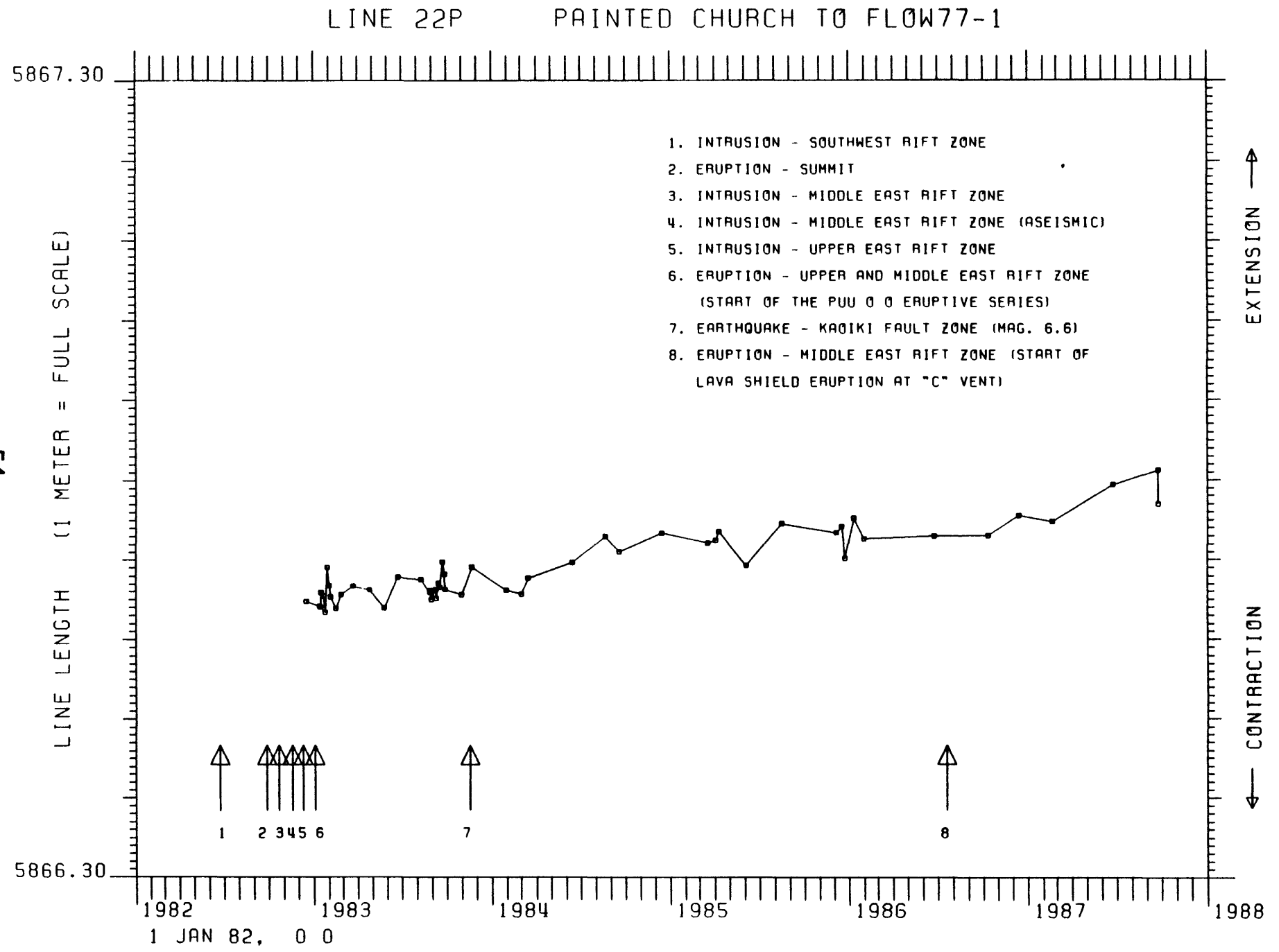

LINE P34 HV0162 TO HOLEI#1
3718.00
3717.00
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
1
2 3 4 5 6
7
8
1982
1983
1984
1985
1986
1987
1988
1 JAN 82, 0 0

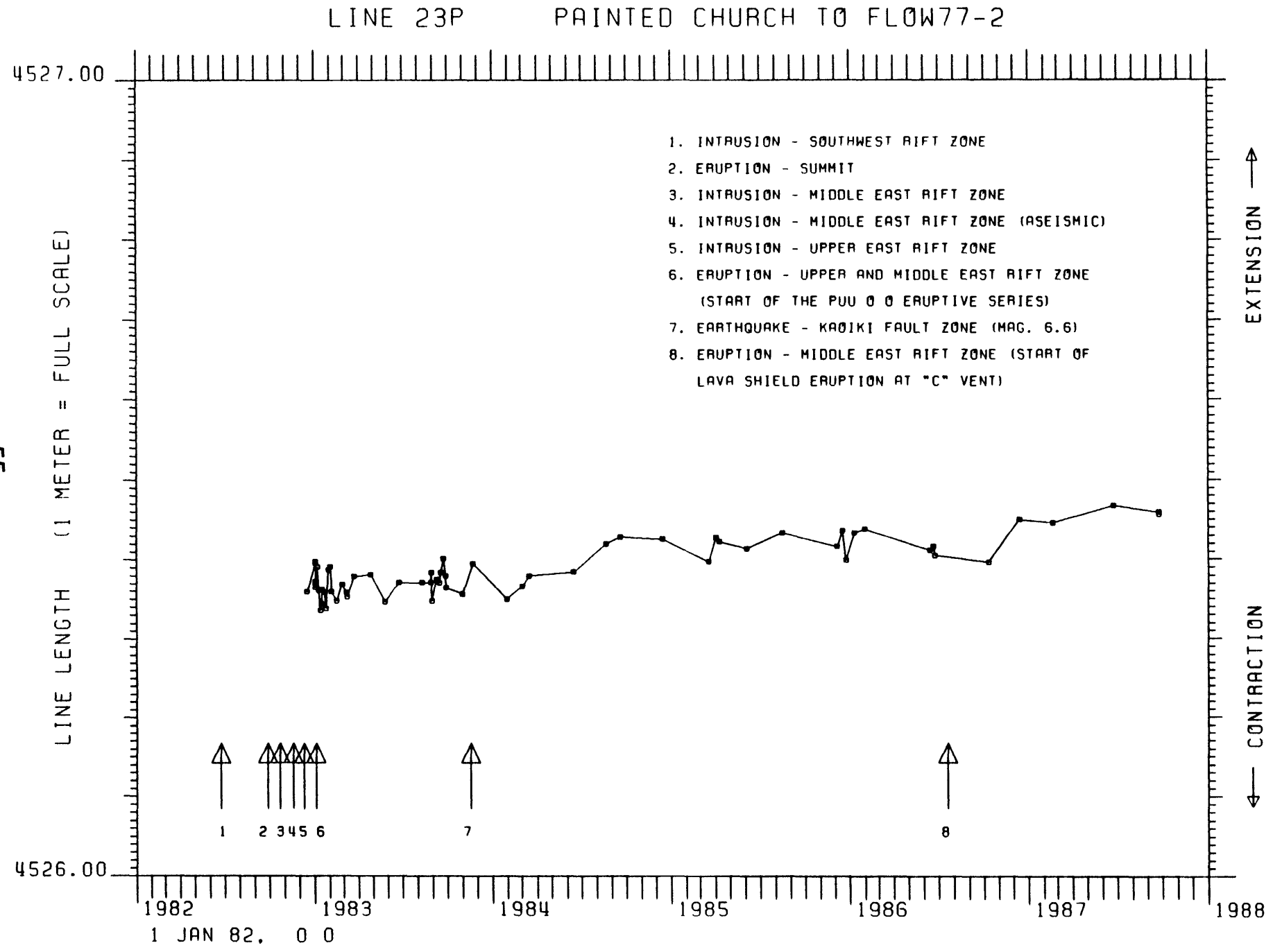

LINE P35 HV0162 TO HOLEI#2
2675.70
2674.70
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1 2 3 4 5 6
7
8
1982
1983
1984
1985
1986
1987
1988
1 JAN 82, 0 0


LINE P36 HV0162 TO HOLEI#3
2030.80
2029.80
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1 2 3 4 5 6
7
8
1982
1983
1984
1985
1986
1987
1988
1 JAN 82, 0 0


LINE P37 HV0162 TO HOLEI#4
501.40
500.40
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1
2 3 4 5 6
7
8
1982
1983
1984
1985
1986
1987
1988
1 JAN 82, 0 0

KILAUEA SOUTH FLANK KALAPANA MONITOR INDIVIDUAL LINE LENGTH TIME SERIES PLOTS


LINE 22P PAINTED CHURCH TO FLOW77-1
5867.30
5866.30
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE (START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF LAVA SHIELD ERUPTION AT "C" VENT)
1
2 3 4 5 6
7
8
1982
1983
1984
1985
1986
1987
1988
1 JAN 82, 0 0


LINE 23P PAINTED CHURCH TO FLOW77-2
4527.00
4526.00
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
1
2 3 4 5 6
7
8
1982
1983
1984
1985
1986
1987
1988
1 JAN 82, 0 0

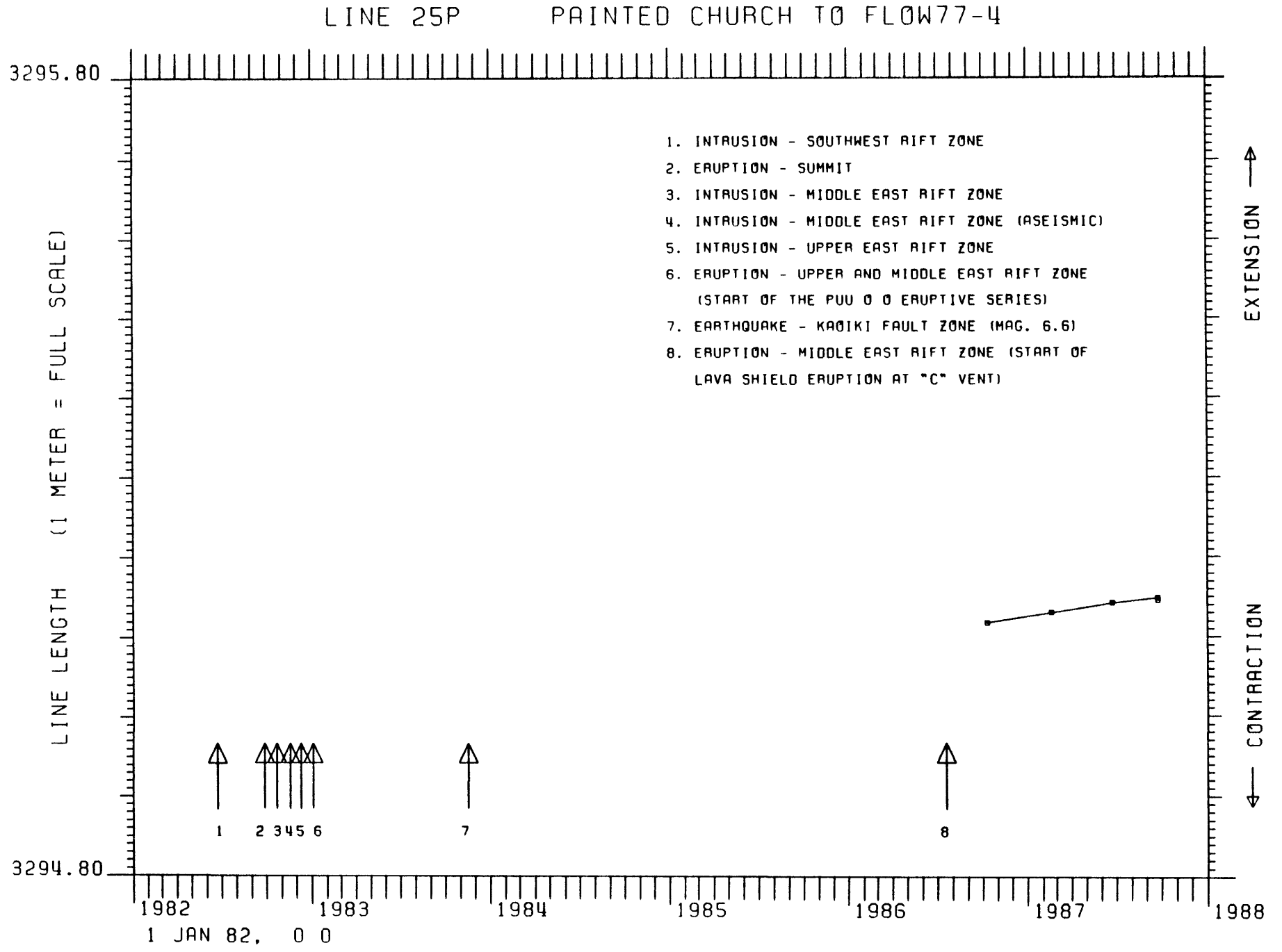

LINE 25P PAINTED CHURCH TO FLOW77-4
3295.80
3294.80
LINE LENGTH (1 METER = FULL SCALE)
EXTENSION
CONTRACTION
1. INTRUSION - SOUTHWEST RIFT ZONE
2. ERUPTION - SUMMIT
3. INTRUSION - MIDDLE EAST RIFT ZONE
4. INTRUSION - MIDDLE EAST RIFT ZONE (ASEISMIC)
5. INTRUSION - UPPER EAST RIFT ZONE
6. ERUPTION - UPPER AND MIDDLE EAST RIFT ZONE
(START OF THE PUU O O ERUPTIVE SERIES)
7. EARTHQUAKE - KAOIKI FAULT ZONE (MAG. 6.6)
8. ERUPTION - MIDDLE EAST RIFT ZONE (START OF
LAVA SHIELD ERUPTION AT "C" VENT)
1
2 3 4 5 6
7
8
1982
1983
1984
1985
1986
1987
1988
1 JAN 82, 0 0

TABLE 1.

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P01;	HVO113	to	KALP1
DATE	TIME	INST.	DIST. (m)
06/02/82	1106	RM	8503.596
06/08/82	0929	RM	8503.613
06/15/82	1200	RM	8503.624
06/18/82	0942	RM	8503.643
06/22/82	1537	RM	8503.602
06/23/82	1120	RM	8503.527
06/24/82	1126	RM	8503.449
06/25/82	1341	RM	8503.450
06/29/82	1200	RM	8503.436
07/09/82	1125	RM	8503.412
07/13/82	1114	RM	8503.432
07/19/82	1130	RM	8503.437
07/30/82	1240	RM	8503.435
08/04/82	0837	RM	8503.465
08/26/82	1257	RM	8503.516
09/25/82	2129	RM	8503.661
09/26/82	0436	RM	8503.714
09/26/82	0538	RM	8503.727
09/26/82	0607	RM	8503.725
09/26/82	0850	RM	8503.748
09/26/82	1003	RM	8503.775
09/26/82	1029	RM	8503.764
09/26/82	1057	RM	8503.772
09/26/82	1127	RM	8503.764
09/27/82	1326	RM	8503.772
09/28/82	1342	RM	8503.761
09/30/82	1614	RM	8503.767
10/01/82	0936	RM	8503.777
10/04/82	1346	RM	8503.785
10/06/82	1402	RM	8503.798
10/12/82	1303	RM	8503.809
10/27/82	0940	RM	8503.842
11/05/82	1130	RM	8503.838
11/12/82	1127	RM	8503.816
11/17/82	1320	RM	8503.814
12/06/82	0930	RM	8503.861
12/09/82	1120	RM	8503.855
12/09/82	2020	RM	8503.859
12/09/82	2050	RM	8503.856
12/11/82	0910	RM	8503.878
12/17/82	0847	RM	8503.924
01/02/83	0315	RM	8503.921
01/02/83	1023	RM	8503.918
01/02/83	1724	RM	8503.853
01/03/83	1515	RM	8503.709
01/04/83	1533	RM	8503.710
01/06/83	1353	RM	8503.492
01/09/83	0942	RM	8503.404

Line P01;	HVO113	to	KALP1
DATE	TIME	INST.	DIST. (m)
01/25/83	1000	RM	8503.359
02/15/83	1100	RM	8503.367
02/22/83	1049	RM	8503.350
03/11/83	1143	RM	8503.332
03/14/83	1303	RM	8503.356
04/12/83	1108	RM	8503.239
04/25/83	1200	RM	8503.265
05/10/83	1435	RM	8503.275
05/16/83	1353	RM	8503.289
05/19/83	1205	RM	8503.270
05/31/83	1143	RM	8503.295
06/09/83	1109	RM	8503.320
06/20/83	1114	RM	8503.286
07/27/83	1200	RM	8503.260
07/29/83	1200	RM	8503.287
08/08/83	1041	RM	8503.302
08/30/83	1540	RM	8503.259
09/08/83	1258	RM	8503.250
09/26/83	1323	RM	8503.228
10/21/83	1445	RM	8503.234
10/31/83	1214	RM	8503.256
11/01/83	1448	RM	8503.239
11/08/83	1027	RM	8503.269
11/18/83	1530	RM	8503.337
11/21/83	1200	RM	8503.351
12/02/83	1055	RM	8503.323
12/22/83	1125	RM	8503.393
02/06/84	1321	RM	8503.350
02/29/84	1012	RM	8503.387
03/14/84	0918	RM	8503.363
04/05/84	0933	RM	8503.381
06/12/84	0955	RM	8503.385
08/15/84	1102	RM	8503.399
09/18/84	1050	RM	8503.387
10/02/84	0940	RM	8503.373
10/19/84	1315	RM	8503.427
10/24/84	1014	RM	8503.390
10/26/84	0812	RM	8503.395
10/29/84	0934	RM	8503.401
11/01/84	0850	RM	8503.405
11/02/84	1311	RM	8503.418
11/02/84	1603	RM	8503.403
11/02/84	2052	RM	8503.375
11/05/84	1043	RM	8503.400
11/13/84	0906	RM	8503.400
11/21/84	0743	RM	8503.366
12/04/84	1344	RM	8503.357
12/11/84	0943	RM	8503.387

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P01; HVO113 to KALP1

DATE	TIME	INST.	DIST. (m)
12/21/84	1015	RM	8503.392
12/28/84	0939	RM	8503.401
01/29/85	0918	RM	8503.404
02/01/85	0826	RM	8503.411
02/04/85	0936	RM	8503.408
02/04/85	1059	RM	8503.401
02/04/85	1335	RM	8503.394
02/04/85	1552	RM	8503.388
02/05/85	1144	RM	8503.338
02/25/85	1430	RM	8503.369
03/13/85	0832	RM	8503.417
03/13/85	1105	RM	8503.393
03/13/85	1551	RM	8503.365
03/15/85	0837	RM	8503.325
03/26/85	0932	RM	8503.363
04/10/85	0838	RM	8503.392
04/23/85	1115	RM	8503.353
05/14/85	1004	RM	8503.389
05/23/85	1116	RM	8503.382
05/30/85	0846	RM	8503.419
06/12/85	0900	RM	8503.417
06/13/85	1310	RM	8503.380
06/28/85	0948	RM	8503.430
07/16/85	1531	RM	8503.410
08/14/85	1550	RM	8503.384
10/03/85	0915	RM	8503.387
10/11/85	0906	RM	8503.419
10/15/85	0830	RM	8503.420
10/21/85	0810	RM	8503.390
10/21/85	1207	RM	8503.378
10/22/85	0908	RM	8503.392
11/07/85	1030	RM	8503.424
11/12/85	0915	RM	8503.426
11/13/85	1230	RM	8503.424
11/14/85	0830	RM	8503.383
12/05/85	0900	RM	8503.418
12/12/85	0925	RM	8503.447
12/19/85	1052	RM	8503.442
12/23/85	0925	RM	8503.443
12/30/85	1135	RM	8503.436
01/02/86	0847	RM	8503.407
01/15/86	1513	RM	8503.422
01/29/86	0933	RM	8503.401
02/06/86	1028	RM	8503.410
02/13/86	0840	RM	8503.426
02/20/86	1000	RM	8503.440
02/24/86	0825	RM	8503.403

Line P01; HVO113 to KALP1

DATE	TIME	INST.	DIST. (m)
03/17/86	0938	RM	8503.424
03/20/86	1512	RM	8503.436
03/25/86	1105	RM	8503.409
06/20/86	0918	RM	8503.435
09/04/86	1030	RM	8503.382
10/02/86	1115	RM	8503.370
10/31/86	0919	RM	8503.375
11/21/86	1553	RM	8503.351
12/04/86	1025	RM	8503.357
12/15/86	1019	RM	8503.348
01/06/87	1422	RM	8503.356
02/11/87	1050	RM	8503.372
03/17/87	0920	RM	8503.347
06/24/87	1054	RM	8503.375
07/16/87	1325	RM	8503.375
08/04/87	1028	RM	8503.347
09/09/87	1421	RM	8503.351

Line P26; HVO113 to KALP7

DATE	TIME	INST.	DIST. (m)
10/02/84	1225	RM	7263.669
10/19/84	1319	RM	7263.725
10/24/84	1010	RM	7263.695
10/26/84	0808	RM	7263.707
10/29/84	0941	RM	7263.714
11/01/84	0857	RM	7263.710
11/02/84	1306	RM	7263.718
11/02/84	1609	RM	7263.705
11/02/84	2048	RM	7263.687
11/05/84	1013	RM	7263.705
11/13/84	0909	RM	7263.717
11/21/84	0739	RM	7263.678
12/04/84	1340	RM	7263.661
12/11/84	0939	RM	7263.673
12/21/84	1012	RM	7263.697
12/28/84	0941	RM	7263.704
01/29/85	0916	RM	7263.715
02/01/85	0818	RM	7263.719
02/04/85	0939	RM	7263.711
02/04/85	1056	RM	7263.704
02/04/85	1331	RM	7263.697
02/04/85	1555	RM	7263.677
02/05/85	1136	RM	7263.633
02/25/85	1430	RM	7263.686

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P26; HVO113 to KALP7

DATE	TIME	INST.	DIST. (m)
03/13/85	0828	RM	7263.718
03/13/85	1110	RM	7263.700
03/13/85	1548	RM	7263.673
03/15/85	0846	RM	7263.642
03/26/85	0938	RM	7263.658
04/10/85	0843	RM	7263.692
04/23/85	1126	RM	7263.652
05/14/85	1019	RM	7263.689
05/23/85	1100	RM	7263.692
05/30/85	0842	RM	7263.722
06/12/85	0907	RM	7263.728
06/13/85	1319	RM	7263.690
06/28/85	0951	RM	7263.730
07/16/85	1535	RM	7263.702
08/14/85	1552	RM	7263.684
10/03/85	0920	RM	7263.686
10/11/85	0910	RM	7263.718
10/15/85	0837	RM	7263.716
10/21/85	0819	RM	7263.690
10/21/85	1210	RM	7263.681
10/22/85	0910	RM	7263.697
11/07/85	1040	RM	7263.718
11/12/85	0918	RM	7263.726
11/13/85	1233	RM	7263.719
11/14/85	0834	RM	7263.685
12/05/85	0905	RM	7263.721
12/12/85	0930	RM	7263.730
12/19/85	1048	RM	7263.733
12/23/85	0915	RM	7263.760
12/30/85	1155	RM	7263.731
01/02/86	0850	RM	7263.702
01/15/86	1508	RM	7263.710
01/29/86	0945	RM	7263.712
02/06/86	1035	RM	7263.710
02/13/86	0843	RM	7263.730
02/20/86	1005	RM	7263.736
02/24/86	0829	RM	7263.700
03/17/86	0935	RM	7263.724
03/20/86	1514	RM	7263.740
03/25/86	1107	RM	7263.699
06/20/86	0952	RM	7263.724
09/04/86	1038	RM	7263.657
10/02/86	1120	RM	7263.667
10/31/86	0926	RM	7263.653
11/21/86	1557	RM	7263.625
12/04/86	1031	RM	7263.638
12/15/86	1030	RM	7263.636

Line P26; HVO113 to KALP7

DATE	TIME	INST.	DIST. (m)
01/06/87	1426	RM	7263.638
02/11/87	1055	RM	7263.645
03/17/87	0929	RM	7263.627
06/24/87	1057	RM	7263.655
08/04/87	1032	RM	7263.629
09/09/87	1424	RM	7263.625

Line P02; HVO113 to KALP2

DATE	TIME	INST.	DIST. (m)
06/02/82	1200	RM	4860.694
06/08/82	0913	RM	4860.714
06/15/82	1200	RM	4860.724
06/18/82	0939	RM	4860.742
06/22/82	1545	RM	4860.700
06/23/82	1124	RM	4860.614
06/24/82	1132	RM	4860.507
06/25/82	1344	RM	4860.499
06/29/82	1443	RM	4860.467
07/09/82	1131	RM	4860.464
07/13/82	1118	RM	4860.492
07/19/82	1135	RM	4860.497
07/30/82	1237	RM	4860.501
08/04/82	0834	RM	4860.528
08/26/82	1301	RM	4860.592
09/25/82	2126	RM	4860.953
09/25/82	2134	RM	4860.951
09/25/82	2319	RM	4860.962
09/26/82	0040	RM	4860.955
09/26/82	0434	RM	4860.955
09/26/82	0536	RM	4860.964
09/26/82	0610	RM	4860.962
09/26/82	0846	RM	4860.986
09/26/82	1000	RM	4860.990
09/26/82	1025	RM	4860.991
09/26/82	1054	RM	4861.000
09/26/82	1123	RM	4861.002
09/27/82	1309	RM	4861.004
09/28/82	1340	RM	4860.998
09/29/82	1512	RM	4861.005
09/30/82	1611	RM	4861.020
10/01/82	0933	RM	4861.015
10/04/82	1343	RM	4861.019
10/06/82	1410	RM	4861.019

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P02;	HVO113	to	KALP2
DATE	TIME	INST.	DIST. (m)
10/12/82	1305	RM	4861.004
10/21/82	1442	RM	4861.030
10/27/82	0937	RM	4861.031
11/05/82	1125	RM	4861.021
11/12/82	1123	RM	4860.990
11/17/82	1324	RM	4860.988
11/30/82	1129	RM	4861.042
12/06/82	1200	RM	4861.054
12/09/82	1117	RM	4861.049
12/09/82	2000	RM	4861.061
12/09/82	2013	RM	4861.070
12/09/82	2043	RM	4861.078
12/11/82	0907	RM	4861.084
12/17/82	0844	RM	4861.135
01/02/83	0311	RM	4861.143
01/02/83	1021	RM	4861.094
01/02/83	1722	RM	4861.035
01/03/83	1511	RM	4860.875
01/04/83	1530	RM	4860.877
01/06/83	1349	RM	4860.638
01/09/83	0939	RM	4860.529
01/25/83	0902	RM	4860.480
02/15/83	1103	RM	4860.481
02/22/83	1046	RM	4860.481
03/07/83	1505	RM	4860.431
03/11/83	1140	RM	4860.449
03/14/83	1301	RM	4860.477
04/12/83	1105	RM	4860.346
04/25/83	1200	RM	4860.366
05/10/83	1433	RM	4860.397
05/16/83	1350	RM	4860.392
05/19/83	1204	RM	4860.382
05/31/83	1140	RM	4860.405
06/09/83	1107	RM	4860.439
06/20/83	1122	RM	4860.394
07/27/83	1200	RM	4860.370
07/29/83	1200	RM	4860.389
08/08/83	1036	RM	4860.417
08/30/83	1536	RM	4860.378
09/08/83	1255	RM	4860.365
09/26/83	1321	RM	4860.336
10/21/83	1448	RM	4860.331
10/31/83	1207	RM	4860.357
11/01/83	1444	RM	4860.346
11/08/83	1027	RM	4860.339
11/09/83	1200	RM	4860.332
11/17/83	1200	RM	4860.393

Line P02;	HVO113	to	KALP2
DATE	TIME	INST.	DIST. (m)
11/18/83	1523	RM	4860.390
11/21/83	1005	RM	4860.408
12/02/83	1052	RM	4860.359
12/22/83	1120	RM	4860.433
02/06/84	1318	RM	4860.400
02/29/84	1008	RM	4860.438
03/14/84	0915	RM	4860.414
04/05/84	0925	RM	4860.422
06/12/84	1020	RM	4860.432
08/15/84	1109	RM	4860.440
09/18/84	1052	RM	4860.433
10/02/84	1200	RM	4860.418
10/19/84	1320	RM	4860.461
10/24/84	1007	RM	4860.444
10/26/84	0803	RM	4860.444
10/29/84	0947	RM	4860.459
11/01/84	0902	RM	4860.447
11/02/84	1316	RM	4860.461
11/02/84	1614	RM	4860.442
11/02/84	2044	RM	4860.426
11/05/84	1018	RM	4860.445
11/13/84	0915	RM	4860.456
11/21/84	0737	RM	4860.405
12/04/84	1335	RM	4860.396
12/11/84	0935	RM	4860.427
12/21/84	1008	RM	4860.436
12/28/84	0945	RM	4860.443
02/04/85	1053	RM	4860.444
02/04/85	1328	RM	4860.431
02/04/85	1558	RM	4860.418
02/05/85	1133	RM	4860.375
02/25/85	1425	RM	4860.414
03/13/85	0900	RM	4860.470
03/13/85	1058	RM	4860.434
03/13/85	1545	RM	4860.412
03/15/85	0841	RM	4860.364
03/26/85	0945	RM	4860.396
04/10/85	0847	RM	4860.440
04/23/85	1131	RM	4860.391
05/14/85	1009	RM	4860.438
05/23/85	1055	RM	4860.444
05/30/85	0850	RM	4860.484
06/12/85	0923	RM	4860.471
06/13/85	1325	RM	4860.445
06/28/85	0954	RM	4860.487
07/16/85	1539	RM	4860.456
08/14/85	1557	RM	4860.441

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P02; HVO113 to KALP2

DATE	TIME	INST.	DIST. (m)
10/03/85	0925	RM	4860.440
10/11/85	0927	RM	4860.460
10/15/85	0840	RM	4860.459
10/21/85	0821	RM	4860.431
10/21/85	1214	RM	4860.434
10/22/85	0912	RM	4860.439
11/07/85	1050	RM	4860.468
11/12/85	0921	RM	4860.474
11/13/85	1236	RM	4860.474
11/14/85	0845	RM	4860.433
12/05/85	0915	RM	4860.475
12/12/85	0935	RM	4860.481
12/13/85	1403	RM	4860.457
12/19/85	1046	RM	4860.475
12/23/85	0924	RM	4860.490
12/30/85	1158	RM	4860.503
01/02/86	0855	RM	4860.434
01/15/86	0900	RM	4860.455
01/15/86	1515	RM	4860.452
01/29/86	0948	RM	4860.440
02/06/86	1038	RM	4860.453
02/13/86	0846	RM	4860.469
02/20/86	1007	RM	4860.477
02/24/86	0832	RM	4860.428
03/17/86	0925	RM	4860.480
03/20/86	1517	RM	4860.483
03/25/86	1110	RM	4860.441
06/20/86	0941	RM	4860.476
09/05/86	1208	RM	4860.384
10/02/86	1114	RM	4860.404
10/31/86	0930	RM	4860.380
11/21/86	1600	RM	4860.351
12/04/86	1036	RM	4860.373
12/15/86	1044	RM	4860.376
01/06/87	1430	RM	4860.376
02/11/87	1100	RM	4860.376
03/17/87	0940	RM	4860.373
06/24/87	1100	RM	4860.388
08/04/87	1036	RM	4860.384
09/09/87	1427	RM	4860.373

Line P03; HVO113 to KALP3

DATE	TIME	INST.	DIST. (m)
06/02/82	1200	RM	3371.087
06/08/82	0911	RM	3371.097
06/15/82	1200	RM	3371.115
06/18/82	0932	RM	3371.097
06/22/82	1541	RM	3371.092
06/23/82	1133	RM	3371.007
06/24/82	1129	RM	3370.921
06/25/82	1350	RM	3370.902
06/29/82	1450	RM	3370.889
07/09/82	1139	RM	3370.903
07/13/82	1121	RM	3370.930
07/19/82	1132	RM	3370.942
07/30/82	1235	RM	3370.958
08/04/82	0833	RM	3370.957
08/26/82	1303	RM	3371.034
09/25/82	2125	RM	3371.492
09/25/82	2137	RM	3371.489
09/25/82	2146	RM	3371.491
09/25/82	2313	RM	3371.503
09/26/82	0038	RM	3371.499
09/26/82	0431	RM	3371.501
09/26/82	0533	RM	3371.515
09/26/82	0613	RM	3371.507
09/26/82	0842	RM	3371.524
09/26/82	0959	RM	3371.538
09/26/82	1023	RM	3371.515
09/26/82	1049	RM	3371.535
09/26/82	1120	RM	3371.531
09/27/82	1313	RM	3371.546
09/28/82	1338	RM	3371.536
09/29/82	1437	RM	3371.551
09/30/82	1608	RM	3371.578
10/01/82	0929	RM	3371.570
10/04/82	1339	RM	3371.546
10/06/82	1405	RM	3371.551
10/12/82	1307	RM	3371.546
10/21/82	1426	RM	3371.538
10/27/82	0935	RM	3371.541
11/05/82	1122	RM	3371.539
11/12/82	1120	RM	3371.508
11/17/82	1333	RM	3371.498
11/30/82	1121	RM	3371.551
12/06/82	1200	RM	3371.556
12/09/82	1113	RM	3371.582
12/09/82	1950	RM	3371.541
12/09/82	2016	RM	3371.535
12/09/82	2046	RM	3371.538

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P03;	HVO113	to	KALP3
DATE	TIME	INST.	DIST. (m)
12/11/82	0902	RM	3371.544
12/17/82	0839	RM	3371.547
01/02/83	0308	RM	3371.541
01/02/83	1016	RM	3371.538
01/02/83	1719	RM	3371.467
01/03/83	1508	RM	3371.336
01/04/83	1527	RM	3371.379
01/06/83	1347	RM	3371.196
01/09/83	0937	RM	3371.109
01/25/83	0900	RM	3371.101
02/15/83	1107	RM	3371.128
02/22/83	1042	RM	3371.145
03/07/83	1503	RM	3371.128
03/11/83	1137	RM	3371.120
03/14/83	1259	RM	3371.139
04/12/83	1101	RM	3371.023
04/25/83	1200	RM	3371.055
05/10/83	1430	RM	3371.099
05/16/83	1347	RM	3371.088
05/19/83	1200	RM	3371.078
05/31/83	1137	RM	3371.119
06/09/83	1105	RM	3371.154
06/20/83	1119	RM	3371.094
07/27/83	1200	RM	3371.089
07/29/83	1200	RM	3371.091
08/08/83	1033	RM	3371.123
09/08/83	1251	RM	3371.058
09/26/83	1315	RM	3371.050
10/21/83	1451	RM	3371.039
10/31/83	1203	RM	3371.074
11/01/83	1442	RM	3371.067
11/08/83	1002	RM	3371.038
11/09/83	1200	RM	3371.041
11/17/83	1200	RM	3371.080
11/18/83	1526	RM	3371.067
11/21/83	0958	RM	3371.089
12/02/83	1049	RM	3371.048
12/22/83	1117	RM	3371.128
02/06/84	1315	RM	3371.094
02/29/84	1006	RM	3371.130
03/14/84	0908	RM	3371.106
04/05/84	0922	RM	3371.139
06/12/84	1030	RM	3371.125
08/15/84	1112	RM	3371.170
09/18/84	1054	RM	3371.173
10/02/84	0930	RM	3371.165
10/19/84	1324	RM	3371.190

Line P03;	HVO113	to	KALP3
DATE	TIME	INST.	DIST. (m)
10/26/84	0758	RM	3371.157
10/29/84	0953	RM	3371.173
11/01/84	0907	RM	3371.170
11/02/84	1302	RM	3371.199
11/02/84	1618	RM	3371.154
11/02/84	2056	RM	3371.147
11/05/84	1025	RM	3371.158
11/13/84	0934	RM	3371.175
11/21/84	0733	RM	3371.121
12/04/84	1328	RM	3371.127
12/11/84	0930	RM	3371.123
12/21/84	1006	RM	3371.156
12/28/84	0949	RM	3371.165
01/29/85	0900	RM	3371.172
02/01/85	0752	RM	3371.182
02/04/85	0942	RM	3371.176
02/04/85	1101	RM	3371.169
02/04/85	1324	RM	3371.144
02/04/85	1601	RM	3371.132
02/05/85	1129	RM	3371.088
02/25/85	1420	RM	3371.135
03/13/85	0816	RM	3371.176
03/13/85	1114	RM	3371.173
03/13/85	1542	RM	3371.145
03/15/85	0844	RM	3371.076
03/26/85	0955	RM	3371.118
04/10/85	0851	RM	3371.168
04/23/85	1135	RM	3371.130
05/14/85	1015	RM	3371.193
05/23/85	1051	RM	3371.189
05/30/85	0826	RM	3371.200
06/12/85	0913	RM	3371.216
06/13/85	1328	RM	3371.190
06/28/85	0958	RM	3371.231
07/16/85	1541	RM	3371.188
08/14/85	1559	RM	3371.173
10/03/85	0932	RM	3371.177
10/11/85	0915	RM	3371.222
10/15/85	0846	RM	3371.206
10/21/85	0824	RM	3371.175
10/21/85	1217	RM	3371.159
10/22/85	0915	RM	3371.167
11/07/85	1100	RM	3371.219
11/12/85	0933	RM	3371.215
11/13/85	1240	RM	3371.216
11/14/85	0847	RM	3371.169
12/05/85	0910	RM	3371.206

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P03; HVO113 to KALP3

DATE	TIME	INST.	DIST. (m)
12/12/85	0940	RM	3371.221
12/19/85	1042	RM	3371.238
12/23/85	0928	RM	3371.242
12/30/85	1140	RM	3371.242
01/02/86	0858	RM	3371.162
01/15/86	1504	RM	3371.196
01/29/86	0951	RM	3371.180
02/06/86	1041	RM	3371.210
02/13/86	0850	RM	3371.229
02/20/86	1011	RM	3371.233
02/24/86	0836	RM	3371.177
03/17/86	0922	RM	3371.231
03/20/86	1521	RM	3371.246
03/25/86	1114	RM	3371.202
06/20/86	0922	RM	3371.228
09/04/86	1045	RM	3371.171
10/31/86	0937	RM	3371.157
11/21/86	1603	RM	3371.135
12/15/86	1050	RM	3371.141
02/11/87	1105	RM	3371.154
03/17/87	0946	RM	3371.147
08/04/87	1038	RM	3371.190
09/09/87	1429	RM	3371.189

Line P25; HVO113 to KALP6

DATE	TIME	INST.	DIST. (m)
10/02/84	0925	RM	2141.978
10/19/84	1329	RM	2141.999
10/24/84	0955	RM	2141.986
10/26/84	0753	RM	2141.992
10/29/84	0957	RM	2141.995
11/01/84	0916	RM	2141.984
11/02/84	1324	RM	2141.997
11/02/84	1625	RM	2141.973
11/02/84	2059	RM	2141.964
11/05/84	1030	RM	2141.984
11/13/84	0937	RM	2141.990
11/21/84	0728	RM	2141.953
12/04/84	1322	RM	2141.932
12/11/84	0922	RM	2141.965
12/21/84	1003	RM	2141.973
12/28/84	0954	RM	2141.995
01/29/85	0902	RM	2141.998
02/01/85	0749	RM	2142.010

Line P25; HVO113 to KALP6

DATE	TIME	INST.	DIST. (m)
02/04/85	0930	RM	2142.008
02/04/85	1104	RM	2141.993
02/04/85	1321	RM	2141.983
02/04/85	1604	RM	2141.966
02/05/85	1125	RM	2141.920
02/25/85	1415	RM	2141.984
03/13/85	0808	RM	2142.004
03/13/85	1539	RM	2141.974
03/15/85	0853	RM	2141.925
03/26/85	0952	RM	2141.963
04/10/85	0857	RM	2142.019
04/23/85	1420	RM	2141.982
05/14/85	1023	RM	2142.010
05/23/85	1043	RM	2142.009
05/30/85	0820	RM	2142.021
06/12/85	1010	RM	2142.031
06/13/85	1343	RM	2142.012
06/28/85	1005	RM	2142.041
07/16/85	1544	RM	2142.006
08/14/85	1601	RM	2142.008
10/11/85	0918	RM	2142.052
10/15/85	0851	RM	2142.040
10/21/85	0827	RM	2142.017
10/21/85	1222	RM	2142.001
10/22/85	0917	RM	2142.008
11/07/85	1110	RM	2142.040
11/12/85	0935	RM	2142.043
11/13/85	1243	RM	2142.049
11/14/85	0850	RM	2142.015
12/05/85	0920	RM	2142.046
12/12/85	0943	RM	2142.050
12/19/85	1040	RM	2142.073
12/23/85	0931	RM	2142.072
12/30/85	1210	RM	2142.057
01/02/86	0900	RM	2142.013
01/15/86	1500	RM	2142.029
01/29/86	0953	RM	2142.032
02/06/86	1044	RM	2142.044
02/13/86	0852	RM	2142.053
02/20/86	1014	RM	2142.070
02/24/86	0839	RM	2142.024
03/17/86	0915	RM	2142.071
03/20/86	1530	RM	2142.067
03/25/86	1119	RM	2142.030
09/05/86	1204	RM	2142.009
10/02/86	1102	RM	2142.029
10/31/86	0942	RM	2142.022

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P25; HVO113 to KALP6

DATE	TIME	INST.	DIST. (m)
11/21/86	1607	RM	2142.009
12/04/86	1045	RM	2142.011
12/15/86	1056	RM	2142.018
01/06/87	1433	RM	2142.013
02/11/87	1108	RM	2142.039
03/17/87	0949	RM	2142.039
06/24/87	1105	RM	2142.074
07/16/87	1252	RM	2142.066
08/04/87	1040	RM	2142.056
09/09/87	1432	RM	2142.058

Line P24; HVO113 to KALP5

DATE	TIME	INST.	DIST. (m)
10/02/84	1030	RM	1027.686
10/19/84	1332	RM	1027.695
10/24/84	1002	RM	1027.679
10/26/84	0747	RM	1027.684
10/29/84	1004	RM	1027.683
11/01/84	0921	RM	1027.684
11/02/84	1329	RM	1027.689
11/02/84	1630	RM	1027.677
11/02/84	2101	RM	1027.679
11/05/84	1037	RM	1027.687
11/13/84	0940	RM	1027.686
11/21/84	0722	RM	1027.677
12/04/84	1316	RM	1027.673
12/11/84	0914	RM	1027.680
12/21/84	0959	RM	1027.688
12/28/84	0958	RM	1027.691
01/29/85	0856	RM	1027.703
02/01/85	0738	RM	1027.690
02/04/85	0927	RM	1027.704
02/04/85	1107	RM	1027.696
02/04/85	1310	RM	1027.690
02/04/85	1608	RM	1027.687
02/05/85	1148	RM	1027.665
02/25/85	1435	RM	1027.696
03/13/85	0805	RM	1027.700
03/13/85	1536	RM	1027.692
03/15/85	0856	RM	1027.666
03/26/85	0949	RM	1027.677
04/10/85	0904	RM	1027.715
04/23/85	1145	RM	1027.705
05/14/85	1026	RM	1027.708

Line P24; HVO113 to KALP5

DATE	TIME	INST.	DIST. (m)
05/23/85	1034	RM	1027.705
05/30/85	0816	RM	1027.705
06/12/85	0937	RM	1027.701
06/13/85	1339	RM	1027.704
06/28/85	1011	RM	1027.721
07/16/85	1548	RM	1027.706
08/14/85	1603	RM	1027.703
10/03/85	0940	RM	1027.709
10/11/85	0923	RM	1027.711
10/15/85	0856	RM	1027.712
10/21/85	0830	RM	1027.713
10/21/85	1227	RM	1027.711
10/22/85	0920	RM	1027.703
11/07/85	1120	RM	1027.717
11/12/85	0939	RM	1027.711
11/13/85	1247	RM	1027.713
11/14/85	0854	RM	1027.708
12/05/85	0925	RM	1027.718
12/12/85	0946	RM	1027.724
12/19/85	1036	RM	1027.734
12/23/85	0934	RM	1027.736
12/30/85	1214	RM	1027.718
01/02/86	0905	RM	1027.710
01/15/86	1458	RM	1027.719
01/29/86	0956	RM	1027.715
02/06/86	1047	RM	1027.732
02/13/86	0856	RM	1027.730
02/20/86	1017	RM	1027.720
02/24/86	0843	RM	1027.717
03/17/86	0851	RM	1027.732
03/20/86	1533	RM	1027.746
03/25/86	1122	RM	1027.718
06/20/86	0928	RM	1027.726
09/04/86	1053	RM	1027.728
10/02/86	1057	RM	1027.719
10/31/86	0954	RM	1027.729
11/21/86	1610	RM	1027.706
12/04/86	1047	RM	1027.708
12/15/86	1059	RM	1027.710
01/06/87	1436	RM	1027.711
02/11/87	1112	RM	1027.717
03/17/87	0952	RM	1027.714
06/24/87	1107	RM	1027.750
07/16/87	1300	RM	1027.734
08/04/87	1043	RM	1027.735
09/09/87	1435	RM	1027.734
10/15/87	1100	RM	1027.725

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P27; HVO113 to KALP8

DATE	TIME	INST.	DIST. (m)
01/29/85	0955	RM	3215.845
02/01/85	0815	RM	3215.832
02/04/85	0923	RM	3215.825
02/04/85	1116	RM	3215.841
02/04/85	1308	RM	3215.845
02/04/85	1615	RM	3215.854
02/04/85	1809	RM	3215.839
02/05/85	1151	RM	3215.881
02/25/85	1410	RM	3215.839
03/13/85	0847	RM	3215.838
03/13/85	1359	RM	3215.857
03/15/85	0906	RM	3215.873
03/26/85	1013	RM	3215.853
04/10/85	0915	RM	3215.876
04/23/85	1156	RM	3215.897
05/14/85	1035	RM	3215.872
05/23/85	1120	RM	3215.859
05/30/85	0855	RM	3215.861
06/12/85	0949	RM	3215.851
06/13/85	1355	RM	3215.880
06/28/85	1014	RM	3215.855
07/16/85	1550	RM	3215.844
08/14/85	1609	RM	3215.856
10/03/85	0950	RM	3215.837
10/11/85	0935	RM	3215.870
10/15/85	0900	RM	3215.830
10/21/85	0833	RM	3215.847
10/21/85	1231	RM	3215.886
10/22/85	0927	RM	3215.871
11/07/85	1150	RM	3215.856
11/12/85	0943	RM	3215.838
11/13/85	1251	RM	3215.829
11/14/85	0858	RM	3215.868
12/05/85	0930	RM	3215.850
12/12/85	0951	RM	3215.839
12/19/85	1018	RM	3215.851
12/23/85	0857	RM	3215.829
12/30/85	1221	RM	3215.819
01/02/86	0907	RM	3215.856
01/15/86	1521	RM	3215.840
01/29/86	1010	RM	3215.874
02/06/86	1050	RM	3215.859
02/13/86	0907	RM	3215.851
02/20/86	1032	RM	3215.845
02/24/86	0855	RM	3215.851
03/17/86	0905	RM	3215.848
03/20/86	1542	RM	3215.835

Line P27; HVO113 to KALP8

DATE	TIME	INST.	DIST. (m)
03/25/86	1127	RM	3215.867
06/20/86	1027	RM	3215.841
09/04/86	1115	RM	3215.902
10/02/86	1052	RM	3215.889
10/31/86	1026	RM	3215.870
11/21/86	1625	RM	3215.867
12/04/86	1115	RM	3215.897
12/15/86	1112	RM	3215.883
01/06/87	1455	RM	3215.871
02/11/87	1138	RM	3215.891
03/17/87	1009	RM	3215.891
06/24/87	1126	RM	3215.940
08/04/87	1101	RM	3215.911
09/09/87	1440	RM	3215.918

Line P28; HVO113 to KALP9

DATE	TIME	INST.	DIST. (m)
02/01/85	0811	RM	4039.744
02/04/85	0918	RM	4039.744
02/04/85	1112	RM	4039.757
02/04/85	1313	RM	4039.769
02/04/85	1612	RM	4039.773
02/04/85	1814	RM	4039.767
02/05/85	1156	RM	4039.794
02/25/85	1400	RM	4039.764
03/13/85	0852	RM	4039.758
03/13/85	1555	RM	4039.785
03/15/85	0901	RM	4039.785
03/26/85	1008	RM	4039.798
04/10/85	0910	RM	4039.797
04/23/85	1152	RM	4039.804
05/14/85	1030	RM	4039.776
05/23/85	1130	RM	4039.760
05/30/85	0901	RM	4039.792
06/12/85	1000	RM	4039.771
06/13/85	1412	RM	4039.788
06/28/85	1030	RM	4039.791
07/16/85	1555	RM	4039.769
08/14/85	1613	RM	4039.795
10/03/85	0955	RM	4039.760
10/11/85	0938	RM	4039.793
10/15/85	0907	RM	4039.761
10/21/85	0837	RM	4039.753
10/22/85	0923	RM	4039.795

TABLE 1. (CONT.)

SUMMIT CROSS- CALDERA LINE LENGTH MEASUREMENTS

Line P28; HVO113 to KALP9

DATE	TIME	INST.	DIST. (m)
11/07/85	1140	RM	4039.766
11/12/85	0947	RM	4039.770
11/13/85	1300	RM	4039.752
11/14/85	0905	RM	4039.816
12/05/85	0935	RM	4039.781
12/12/85	0957	RM	4039.757
12/19/85	1025	RM	4039.773
12/23/85	0900	RM	4039.760
12/30/85	1227	RM	4039.758
01/02/86	0911	RM	4039.774
01/15/86	1525	RM	4039.766
01/29/86	1014	RM	4039.817
02/06/86	1053	RM	4039.792
02/13/86	0911	RM	4039.757
02/20/86	1037	RM	4039.756
03/17/86	0910	RM	4039.770
03/20/86	1545	RM	4039.763
03/25/86	1132	RM	4039.801
06/20/86	1010	RM	4039.795
09/05/86	1215	RM	4039.832
10/02/86	1047	RM	4039.834
10/31/86	1029	RM	4039.832
11/21/86	1621	RM	4039.800
12/04/86	1104	RM	4039.825
12/15/86	1117	RM	4039.832
01/06/87	1452	RM	4039.815
02/11/87	1132	RM	4039.818
03/17/87	1013	RM	4039.842
06/24/87	1130	RM	4039.889
08/04/87	1104	RM	4039.874
09/09/87	1443	RM	4039.873

TABLE 2.

SUMMIT QUADRILATERAL LINE LENGTH MEASUREMENTS

Line P29; HVO113 to WL

DATE	TIME	INST.	DIST. (m)
12/13/85	1408	RM	3265.641
12/19/85	1030	RM	3265.676
12/23/85	0904	RM	3265.667
01/02/86	0915	RM	3265.623
01/15/86	0922	RM	3265.654
01/29/86	1000	RM	3265.636
02/06/86	1021	RM	3265.643
02/13/86	0900	RM	3265.668
02/20/86	1021	RM	3265.665
02/24/86	0846	RM	3265.630
03/17/86	0900	RM	3265.669
03/20/86	1600	RM	3265.674
03/25/86	1137	RM	3265.646
09/05/86	1145	RM	3265.595
10/02/86	1042	RM	3265.595
10/31/86	1039	RM	3265.585
11/21/86	1615	RM	3265.570
12/04/86	1057	RM	3265.567
12/15/86	1025	RM	3265.572
01/06/87	1445	RM	3265.556
02/11/87	1125	RM	3265.565
03/17/87	1003	RM	3265.571
06/24/87	1120	RM	3265.608
08/04/87	1059	RM	3265.599
09/09/87	1451	RM	3265.572

Line P30; HVO113 to SANDHILL

DATE	TIME	INST.	DIST. (m)
12/13/85	1400	RM	3160.671
12/19/85	1057	RM	3160.689
12/23/85	0939	RM	3160.691
01/02/86	0917	RM	3160.652
01/15/86	0853	RM	3160.678
01/29/86	1005	RM	3160.673
02/06/86	1025	RM	3160.665
02/13/86	0903	RM	3160.693
02/20/86	1025	RM	3160.704
02/24/86	0851	RM	3160.646
03/17/86	0855	RM	3160.699
03/20/86	1538	RM	3160.702
03/25/86	1142	RM	3160.686
09/05/86	1149	RM	3160.629
10/02/86	1036	RM	3160.635
10/31/86	1016	RM	3160.622
11/21/86	1629	RM	3160.623

Line P30; HVO113 to SANDHILL

DATE	TIME	INST.	DIST. (m)
12/04/86	1052	RM	3160.627
12/15/86	1105	RM	3160.627
01/06/87	1439	RM	3160.628
02/11/87	1120	RM	3160.638
03/17/87	1005	RM	3160.626
06/24/87	1112	RM	3160.684
07/16/87	1319	RM	3160.670
08/04/87	1049	RM	3160.659
09/09/87	1446	RM	3160.657

Line P31; SANDHILL to WL

DATE	TIME	INST.	DIST. (m)
12/13/85	1315	RM	4903.617
12/19/85	1130	RM	4903.646
12/23/85	1012	RM	4903.620
01/02/86	0937	RM	4903.584
01/15/86	1436	RM	4903.593
01/29/86	1044	RM	4903.610
02/06/86	1000	RM	4903.607
02/13/86	0931	RM	4903.600
02/20/86	1110	RM	4903.626
02/24/86	0948	RM	4903.587
03/17/86	1105	RM	4903.610
03/25/86	1538	RM	4903.597
09/05/86	1104	RM	4903.529
10/31/86	1118	RM	4903.525
11/21/86	1037	RM	4903.518
12/04/86	1150	RM	4903.514
12/15/86	1148	RM	4903.529
01/06/87	1522	RM	4903.514
02/11/87	1324	RM	4903.512
03/17/87	1045	RM	4903.504
06/24/87	1157	RM	4903.517
08/04/87	0956	RM	4903.514
09/09/87	1311	RM	4903.491

Line P32; SANDHILL to KALP2

DATE	TIME	INST.	DIST. (m)
12/13/85	1320	RM	2647.736
12/19/85	1123	RM	2647.762

TABLE 2. (CONT.)

SUMMIT QUADRILATERAL LINE LENGTH MEASUREMENTS

Line P32; SANDHILL to KALP2

DATE	TIME	INST.	DIST. (m)
12/23/85	1017	RM	2647.757
01/02/86	0942	RM	2647.747
01/15/86	1432	RM	2647.749
01/29/86	1050	RM	2647.751
02/06/86	0957	RM	2647.741
02/13/86	0935	RM	2647.763
02/20/86	1118	RM	2647.756
02/24/86	0946	RM	2647.737
03/17/86	1012	RM	2647.762
03/25/86	1530	RM	2647.745
09/05/86	1108	RM	2647.704
10/31/86	1124	RM	2647.703
11/21/86	1045	RM	2647.708
12/04/86	1155	RM	2647.691
12/15/86	1155	RM	2647.697
01/06/87	1522	RM	2647.690
02/11/87	1335	RM	2647.672
03/17/87	1050	RM	2647.689
06/24/87	1154	RM	2647.696
08/04/87	0950	RM	2647.695
09/09/87	1315	RM	2647.683

Line P33; KALP2 to WL

DATE	TIME	INST.	DIST. (m)
12/13/85	1213	RM	4860.586
12/19/85	1211	RM	4860.590
12/23/85	1045	RM	4860.587
01/02/86	1010	RM	4860.555
01/15/86	1247	RM	4860.570
01/29/86	1230	RM	4860.560
02/05/86	1038	RM	4860.570
02/13/86	1006	RM	4860.595
02/20/86	1155	RM	4860.590
02/24/86	1022	RM	4860.551
03/17/86	1131	RM	4860.592
03/25/86	1600	RM	4860.584
09/05/86	1025	RM	4860.521
10/31/86	1153	RM	4860.509
11/21/86	1700	RM	4860.533
12/04/86	1223	RM	4860.499
12/15/86	1223	RM	4860.508
01/06/87	1555	RM	4860.500
02/11/87	1402	RM	4860.501
03/17/87	1024	RM	4860.497

Line P33; KALP2 to WL

DATE	TIME	INST.	DIST. (m)
06/25/87	1202	RM	4860.503
06/25/87	1204	RM	4860.502
08/04/87	0916	RM	4860.500
09/09/87	1241	RM	4860.477

TABLE 3.

UPPER SOUTHWEST RIFT ZONE LINE LENGTH MEASUREMENTS

Line P05; LACY to SWP1

DATE	TIME	INST.	DIST. (m)
06/01/82	1129	RM	10020.508
06/07/82	1200	RM	10020.498
06/15/82	1200	RM	10020.528
06/22/82	0940	RM	10020.543
06/22/82	1055	RM	10020.551
06/22/82	1140	RM	10020.539
06/23/82	0938	RM	10020.560
06/24/82	0930	RM	10020.516
06/24/82	1402	RM	10020.518
06/25/82	1027	RM	10020.528
06/25/82	1500	RM	10020.521
06/28/82	1157	RM	10020.502
06/29/82	1155	RM	10020.517
07/09/82	0939	RM	10020.553
07/13/82	1030	RM	10020.534
07/19/82	1045	RM	10020.527
08/26/82	1214	RM	10020.572
09/17/82	0929	RM	10020.611
09/21/82	1010	RM	10020.612
09/28/82	0944	RM	10020.596
10/12/82	1152	RM	10020.595
11/05/82	1034	RM	10020.634
11/17/82	1025	RM	10020.660
12/06/82	1107	RM	10020.632
02/22/83	0954	RM	10020.435
04/11/83	1000	RM	10020.413
04/26/83	0946	RM	10020.429
02/06/84	1111	RM	10020.121
03/14/84	1012	RM	10020.083
06/13/84	0920	RM	10020.101
08/15/84	0953	RM	10020.120
09/18/84	0945	RM	10020.105
10/19/84	1051	RM	10020.096
12/13/84	0956	RM	10020.132
03/05/85	1000	RM	10020.102
05/31/85	0928	RM	10020.114
10/03/85	1050	RM	10020.098
01/30/86	1003	RM	10020.121
03/07/86	0936	RM	10020.086
03/17/86	1428	RM	10020.076
03/25/86	0948	RM	10020.091
08/05/86	0940	RM	10020.067
10/24/86	0910	RM	10020.067
12/19/86	0955	RM	10020.059
02/10/87	1400	RM	10020.073
08/25/87	0905	RM	10020.079
09/08/87	1128	RM	10020.052
09/09/87	1000	RM	10020.088

Line P23; LACY to SWP9

DATE	TIME	INST.	DIST. (m)
09/21/82	1106	RM	8766.649
09/28/82	1047	RM	8766.647
10/04/82	1119	RM	8766.660
10/12/82	1155	RM	8766.634
11/05/82	1031	RM	8766.653
12/06/82	1104	RM	8766.663
02/22/83	0951	RM	8766.446
04/11/83	1000	RM	8766.411
04/26/83	0942	RM	8766.411
05/19/83	0924	RM	8766.411
05/31/83	1030	RM	8766.460
06/09/83	1200	RM	8766.435
06/20/83	1026	RM	8766.432
08/08/83	0948	RM	8766.415
10/21/83	1342	RM	8766.430
11/17/83	1008	RM	8766.286
11/18/83	0920	RM	8766.293
12/02/83	0958	RM	8766.284
12/22/83	1349	RM	8766.283
02/06/84	1048	RM	8766.332
03/14/84	1010	RM	8766.288
06/13/84	0927	RM	8766.295
08/15/84	0955	RM	8766.306
09/18/84	0945	RM	8766.305
10/19/84	1047	RM	8766.300
12/13/84	0959	RM	8766.318
05/31/85	0933	RM	8766.310
10/03/85	1055	RM	8766.283
01/30/86	1011	RM	8766.310
03/07/86	0952	RM	8766.265
03/17/86	1538	RM	8766.258
08/05/86	0945	RM	8766.285
10/24/86	0912	RM	8766.277
12/19/86	0958	RM	8766.245
02/10/87	1402	RM	8766.272
06/24/87	0915	RM	8766.275
08/25/87	0908	RM	8766.274

Line P06; LACY to SWP2

DATE	TIME	INST.	DIST. (m)
06/01/82	1339	RM	7883.683
06/07/82	1104	RM	7883.675
06/15/82	1200	RM	7883.703
06/22/82	0935	RM	7883.715
06/22/82	1108	RM	7883.714

TABLE 3. (CONT.)

UPPER SOUTHWEST RIFT ZONE LINE LENGTH MEASUREMENTS

Line P06; LACY to SWP2

DATE	TIME	INST.	DIST. (m)
06/22/82	1145	RM	7883.712
06/22/82	1322	RM	7883.713
06/23/82	0942	RM	7883.705
06/24/82	0941	RM	7883.688
06/24/82	1406	RM	7883.673
06/25/82	1033	RM	7883.683
06/25/82	1502	RM	7883.676
06/28/82	1149	RM	7883.665
06/29/82	1205	RM	7883.668
07/09/82	0934	RM	7883.690
07/13/82	1034	RM	7883.673
07/19/82	1049	RM	7883.683
08/26/82	1212	RM	7883.720
09/17/82	0926	RM	7883.751
09/21/82	0930	RM	7883.768
09/28/82	0950	RM	7883.755
10/04/82	1116	RM	7883.764
10/12/82	1157	RM	7883.750
11/05/82	1028	RM	7883.786
11/17/82	1028	RM	7883.769
12/06/82	1101	RM	7883.763
02/22/83	0948	RM	7883.558
04/11/83	1000	RM	7883.530
04/26/83	0939	RM	7883.490
05/19/83	0926	RM	7883.532
05/31/83	1034	RM	7883.567
06/09/83	1000	RM	7883.554
06/20/83	1023	RM	7883.552
08/08/83	0945	RM	7883.540
10/21/83	1345	RM	7883.553
11/17/83	1004	RM	7883.270
11/18/83	0925	RM	7883.285
12/02/83	0955	RM	7883.252
12/22/83	1345	RM	7883.258
02/06/84	1045	RM	7883.288
03/14/84	1008	RM	7883.261
10/19/84	1044	RM	7883.268
12/13/84	1002	RM	7883.287
03/05/85	1010	RM	7883.277
05/31/85	0936	RM	7883.301
10/03/85	1057	RM	7883.264
01/30/86	1014	RM	7883.310
03/07/86	0946	RM	7883.271
03/17/86	1425	RM	7883.283
03/25/86	0959	RM	7883.289
08/05/86	0950	RM	7883.278
10/24/86	0915	RM	7883.268
12/19/86	1003	RM	7883.251

Line P06; LACY to SWP2

DATE	TIME	INST.	DIST. (m)
02/10/87	1405	RM	7883.261
06/24/87	0919	RM	7883.277
08/25/87	0914	RM	7883.273
08/25/87	0940	RM	7883.273
09/08/87	1133	RM	7883.256
09/09/87	1002	RM	7883.281

Line P22; LACY to SWP8

DATE	TIME	INST.	DIST. (m)
09/21/82	1005	RM	6907.153
10/04/82	1113	RM	6907.163
11/05/82	1026	RM	6907.169
11/17/82	1059	RM	6907.168
12/10/82	1059	RM	6907.171
04/26/83	0935	RM	6907.028
03/14/84	1005	RM	6906.718
06/13/84	0935	RM	6906.706
08/15/84	0958	RM	6906.749
09/18/84	0947	RM	6906.743
10/19/84	1100	RM	6906.743
12/13/84	1006	RM	6906.742
03/05/85	1015	RM	6906.748
05/31/85	0947	RM	6906.766
10/03/85	1103	RM	6906.747
01/30/86	1030	RM	6906.791
03/07/86	1000	RM	6906.752
03/17/86	1542	RM	6906.740
03/25/86	1001	RM	6906.779
08/05/86	1015	RM	6906.764
10/24/86	0921	RM	6906.770
12/19/86	1005	RM	6906.758
02/10/87	1407	RM	6906.766
06/24/87	0926	RM	6906.792
08/25/87	0917	RM	6906.800
09/08/87	1136	RM	6906.773
09/09/87	1005	RM	6906.800

Line P21; LACY to SWP7

DATE	TIME	INST.	DIST. (m)
09/21/82	0944	RM	6647.992
10/04/82	1110	RM	6648.008
10/12/82	1208	RM	6647.988

TABLE 3. (CONT.)

UPPER SOUTHWEST RIFT ZONE LINE LENGTH MEASUREMENTS

Line P21; LACY to SWP7

DATE	TIME	INST.	DIST. (m)
11/17/82	1055	RM	6647.999
12/06/82	1056	RM	6648.008
02/22/83	0945	RM	6647.907
04/11/83	1000	RM	6647.892
04/26/83	0932	RM	6647.913
05/19/83	0932	RM	6647.886
05/31/83	1036	RM	6647.919
06/09/83	0959	RM	6647.910
06/20/83	1021	RM	6647.932
10/21/83	1342	RM	6647.915
11/17/83	0959	RM	6647.640
11/18/83	0930	RM	6647.663
12/02/83	0952	RM	6647.634
12/22/83	1402	RM	6647.632
02/06/84	1024	RM	6647.666
06/13/84	0936	RM	6647.642
08/15/84	1004	RM	6647.681
09/18/84	0950	RM	6647.678
10/19/84	1110	RM	6647.682
12/13/84	1010	RM	6647.692
03/05/85	1020	RM	6647.696
05/31/85	0951	RM	6647.722
10/03/85	1108	RM	6647.699
03/07/86	0959	RM	6647.725
03/17/86	1420	RM	6647.733
03/25/86	1005	RM	6647.752
08/05/86	0954	RM	6647.738
10/24/86	0925	RM	6647.751
12/19/86	1010	RM	6647.741
02/10/87	1410	RM	6647.748
06/24/87	0933	RM	6647.789
08/25/87	0920	RM	6647.778
09/08/87	1139	RM	6647.750
09/09/87	1009	RM	6647.781

Line P07; LACY to SWP3

DATE	TIME	INST.	DIST. (m)
06/01/82	1500	RM	6120.193
06/07/82	1101	RM	6120.199
06/15/82	1200	RM	6120.206
06/22/82	0925	RM	6120.200
06/22/82	0946	RM	6120.201
06/22/82	1105	RM	6120.204
06/22/82	1147	RM	6120.197
06/22/82	1317	RM	6120.198

Line P07; LACY to SWP3

DATE	TIME	INST.	DIST. (m)
06/23/82	0943	RM	6120.215
06/24/82	0937	RM	6120.241
06/24/82	1400	RM	6120.227
06/25/82	1025	RM	6120.242
06/25/82	1505	RM	6120.236
06/28/82	1144	RM	6120.217
06/29/82	1208	RM	6120.231
07/09/82	0929	RM	6120.243
07/13/82	1020	RM	6120.224
07/19/82	1040	RM	6120.217
08/26/82	1209	RM	6120.246
09/17/82	0921	RM	6120.260
09/21/82	0907	RM	6120.254
09/28/82	1200	RM	6120.262
10/04/82	1108	RM	6120.282
10/12/82	1209	RM	6120.258
11/05/82	1023	RM	6120.279
11/17/82	1031	RM	6120.276
12/06/82	1053	RM	6120.277
02/22/83	0932	RM	6120.249
04/11/83	1000	RM	6120.216
05/19/83	0934	RM	6120.223
05/31/83	1039	RM	6120.246
06/09/83	0951	RM	6120.239
06/20/83	1016	RM	6120.238
08/08/83	0942	RM	6120.256
10/21/83	1339	RM	6120.257
11/17/83	0957	RM	6119.970
11/18/83	0935	RM	6119.989
12/02/83	0948	RM	6119.967
12/22/83	1352	RM	6119.964
02/06/84	1015	RM	6119.985
03/14/84	1000	RM	6119.986
06/13/84	0944	RM	6119.972
08/15/84	1006	RM	6120.013
09/18/84	0956	RM	6120.010
10/19/84	1103	RM	6120.011
12/13/84	1014	RM	6120.025
03/05/85	1030	RM	6120.031
05/31/85	0957	RM	6120.052
10/03/85	1115	RM	6120.040
01/30/86	1020	RM	6120.080
03/07/86	1010	RM	6120.051
03/17/86	1415	RM	6120.062
03/25/86	1007	RM	6120.074
08/05/86	0957	RM	6120.068
10/24/86	0929	RM	6120.082
12/19/86	1013	RM	6120.065

TABLE 3. (CONT.)

UPPER SOUTHWEST RIFT ZONE LINE LENGTH MEASUREMENTS

Line P07; LACY to SWP3

DATE	TIME	INST.	DIST. (m)
02/10/87	1413	RM	6120.075
06/24/87	0923	RM	6120.106
08/25/87	0924	RM	6120.122
09/08/87	1143	RM	6120.089
09/09/87	1011	RM	6120.120

Line P20; LACY to SWP6

DATE	TIME	INST.	DIST. (m)
02/10/87	1425	RM	5183.259
06/24/87	0946	RM	5183.297
08/25/87	0928	RM	5183.294
09/08/87	1148	RM	5183.267
09/09/87	1013	RM	5183.316

Line P20; LACY to SWP6

DATE	TIME	INST.	DIST. (m)
09/17/82	1200	RM	5183.372
09/21/82	0911	RM	5183.373
09/28/82	0954	RM	5183.383
10/04/82	1106	RM	5183.396
10/12/82	1213	RM	5183.370
11/05/82	1020	RM	5183.410
11/17/82	1052	RM	5183.378
12/06/82	1050	RM	5183.385
02/22/83	0934	RM	5183.436
04/11/83	1000	RM	5183.441
04/26/83	0928	RM	5183.465
05/19/83	0939	RM	5183.430
05/31/83	1043	RM	5183.442
06/09/83	0957	RM	5183.446
06/20/83	1018	RM	5183.435
08/08/83	0936	RM	5183.445
10/21/83	1336	RM	5183.460
11/17/83	0954	RM	5183.137
11/18/83	0940	RM	5183.138
12/02/83	0943	RM	5183.132
12/22/83	1414	RM	5183.134
02/06/84	1010	RM	5183.159
03/14/84	1000	RM	5183.145
06/13/84	0948	RM	5183.147
08/15/84	1008	RM	5183.177
09/18/84	0957	RM	5183.176
10/19/84	1112	RM	5183.168
12/13/84	1017	RM	5183.195
03/05/85	1040	RM	5183.181
05/31/85	0959	RM	5183.218
10/03/85	1046	RM	5183.209
01/30/86	1034	RM	5183.262
03/07/86	1015	RM	5183.218
03/17/86	1435	RM	5183.220
03/25/86	1011	RM	5183.238
08/05/86	1000	RM	5183.202
10/24/86	0943	RM	5183.221

Line P19; LACY to SWP5

DATE	TIME	INST.	DIST. (m)
09/17/82	1116	RM	4293.171
09/21/82	1113	RM	4293.167
09/28/82	0956	RM	4293.200
10/04/82	1103	RM	4293.195
10/12/82	1206	RM	4293.161
11/05/82	1018	RM	4293.220
11/06/82	1018	RM	4293.220
11/17/82	1034	RM	4293.202
12/06/82	1045	RM	4293.197
02/22/83	0938	RM	4293.279
04/11/83	1000	RM	4293.278
04/26/83	0924	RM	4293.315
05/19/83	0942	RM	4293.270
05/31/83	1046	RM	4293.284
06/09/83	0948	RM	4293.289
06/20/83	1016	RM	4293.277
08/08/83	0935	RM	4293.297
10/21/83	1333	RM	4293.294
11/17/83	0951	RM	4293.040
11/18/83	0945	RM	4293.063
12/02/83	0941	RM	4293.046
12/22/83	1358	RM	4293.041
02/06/84	1004	RM	4293.064
03/14/84	0957	RM	4293.059
06/13/84	0952	RM	4293.063
08/15/84	1011	RM	4293.119
09/18/84	0952	RM	4293.098
10/19/84	1108	RM	4293.094
12/13/84	1023	RM	4293.102
03/05/85	1050	RM	4293.130
05/31/85	1004	RM	4293.138
10/03/85	1125	RM	4293.123
01/30/86	1045	RM	4293.179
03/07/86	1020	RM	4293.140
03/17/86	1521	RM	4293.147
03/25/86	1015	RM	4293.146
10/24/86	0934	RM	4293.158

TABLE 3. (CONT.)

UPPER SOUTHWEST RIFT ZONE LINE LENGTH MEASUREMENTS

Line P19; LACY to SWP5

DATE	TIME	INST.	DIST. (m)
12/19/86	1023	RM	4293.164
02/10/87	1415	RM	4293.167
06/24/87	0942	RM	4293.221
08/25/87	0929	RM	4293.218
09/08/87	1152	RM	4293.193
09/09/87	1018	RM	4293.237

Line P08; LACY to SWP4

DATE	TIME	INST.	DIST. (m)
06/01/82	1237	RM	3515.509
06/07/82	1057	RM	3515.513
06/15/82	1200	RM	3515.505
06/18/82	1200	RM	3515.493
06/22/82	0920	RM	3515.496
06/22/82	1111	RM	3515.487
06/22/82	1324	RM	3515.492
06/22/82	1407	RM	3515.487
06/23/82	0948	RM	3515.522
06/24/82	0945	RM	3515.555
06/24/82	1409	RM	3515.546
06/25/82	1038	RM	3515.553
06/25/82	1508	RM	3515.545
06/28/82	1129	RM	3515.557
06/29/82	1214	RM	3515.551
07/09/82	0926	RM	3515.557
07/13/82	1024	RM	3515.553
07/19/82	1052	RM	3515.539
08/26/82	1205	RM	3515.546
09/17/82	0931	RM	3515.548
09/21/82	1111	RM	3515.531
09/28/82	0958	RM	3515.537
10/04/82	1100	RM	3515.552
10/12/82	1205	RM	3515.521
11/05/82	1014	RM	3515.573
11/17/82	1038	RM	3515.546
12/03/82	1042	RM	3515.528
02/22/83	0942	RM	3515.627
04/11/83	1000	RM	3515.640
04/26/83	0920	RM	3515.679
05/19/83	0945	RM	3515.628
05/31/83	1048	RM	3515.643
06/09/83	1002	RM	3515.648
06/20/83	1010	RM	3515.645
08/08/83	0933	RM	3515.654
10/21/83	1330	RM	3515.664

Line P08: LACY to SWP4

DATE	TIME	INST.	DIST. (m)
11/17/83	0947	RM	3515.414
11/18/83	0950	RM	3515.438
12/02/83	0938	RM	3515.416
12/22/83	1341	RM	3515.410
02/06/84	1000	RM	3515.437
03/14/84	0954	RM	3515.423
06/13/84	0955	RM	3515.412
08/15/84	1019	RM	3515.471
09/18/84	1002	RM	3515.471
10/19/84	1110	RM	3515.450
12/13/84	1021	RM	3515.462
03/05/85	1100	RM	3515.484
05/31/85	1008	RM	3515.497
10/03/85	1117	RM	3515.484
01/30/86	1038	RM	3515.548
03/07/86	1025	RM	3515.519
03/25/86	1020	RM	3515.520
08/05/86	1010	RM	3515.515
10/24/86	0937	RM	3515.531
12/19/86	1026	RM	3515.515
02/10/87	1420	RM	3515.535
06/24/87	0950	RM	3515.570
08/25/87	0933	RM	3515.572
09/08/87	1154	RM	3515.540
09/09/87	1019	RM	3515.587

TABLE 4.

UPPER EAST RIFT ZONE AND SOUTH FLANK LINE LENGTH MEASUREMENTS

Line P09; LAVA CHANNEL to APUA PERM

DATE	TIME	INST.	DIST. (m)
06/02/82	1200	RM	7609.848
06/04/82	1200	RM	7609.854
06/15/82	1200	RM	7609.872
06/23/82	1235	RM	7609.878
07/13/82	1202	RM	7609.873
09/13/82	1057	RM	7609.881
11/04/82	1022	RM	7609.854
12/09/82	0927	RM	7609.856
01/03/83	1637	RM	7609.823
01/09/83	1051	RM	7609.841
01/25/83	1026	RM	7609.832
05/19/83	1048	RM	7609.881
08/08/83	1318	RM	7609.829
08/30/83	1303	RM	7609.827
09/12/83	1017	RM	7609.831
09/26/83	1050	RM	7609.846
11/17/83	1459	RM	7609.847
02/06/84	1033	RM	7609.844
03/14/84	1042	RM	7609.865
06/14/84	1405	RM	7609.861
08/20/84	0915	RM	7609.897
09/18/84	1402	RM	7609.899
12/14/84	1044	RM	7609.893
03/04/85	1050	RM	7609.889
03/18/85	0915	RM	7609.918
03/28/85	1338	RM	7609.902
04/09/85	1140	RM	7609.882
04/10/85	1107	RM	7609.922
06/03/85	1000	RM	7609.919
08/14/85	1447	RM	7609.908
10/11/85	1120	RM	7609.878
12/12/85	1240	RM	7609.891
12/16/85	1133	RM	7609.882
12/23/85	1154	RM	7609.883
01/02/86	1250	RM	7609.889
01/10/86	1145	RM	7609.899
01/29/86	1441	RM	7609.890
02/05/86	0927	RM	7609.900
02/13/86	1303	RM	7609.880
02/18/86	1000	RM	7609.908
02/20/86	1503	RM	7609.884
02/24/86	1105	RM	7609.880
03/07/86	1123	RM	7609.904
03/18/86	1105	RM	7609.875
03/25/86	1411	RM	7609.888
06/20/86	1104	RM	7609.907
09/22/86	1338	RM	7609.973
09/24/86	1321	RM	7609.970

Line P09; LAVA CHANNEL to APUA PERM

DATE	TIME	INST.	DIST. (m)
10/29/86	1210	RM	7609.912
12/11/86	1011	RM	7609.904
02/04/87	1148	RM	7609.891
06/25/87	1104	RM	7609.951
08/25/87	1306	RM	7609.925
08/25/87	1318	RM	7609.929

Line P10; LAVA CHANNEL to MAUNA ULU

DATE	TIME	INST.	DIST. (m)
06/04/82	1200	RM	4616.641
06/15/82	1200	RM	4616.653
06/23/82	1243	RM	4616.663
06/23/82	1258	RM	4616.660
07/13/82	1207	RM	4616.672
07/13/82	1224	RM	4616.666
09/13/82	1036	RM	4616.680
10/06/82	1135	RM	4616.687
10/12/82	1506	RM	4616.669
11/04/82	1028	RM	4616.705
01/03/83	1633	RM	4616.799
01/25/83	1020	RM	4616.809
05/19/83	1051	RM	4616.811
06/13/83	1116	RM	4616.838
08/08/83	1321	RM	4616.837
08/30/83	1257	RM	4616.835
09/12/83	1024	RM	4616.843
09/26/83	1054	RM	4616.856
11/17/83	1502	RM	4616.877
02/06/84	1040	RM	4616.892
03/15/84	1032	RM	4616.893
06/14/84	1416	RM	4616.889
08/20/84	0922	RM	4616.906
09/18/84	1405	RM	4616.916
12/14/84	1036	RM	4616.909
03/04/85	1025	RM	4616.938
03/18/85	0930	RM	4616.959
03/28/85	1335	RM	4616.934
04/10/85	1102	RM	4616.953
06/03/85	1008	RM	4616.950
08/14/85	1455	RM	4616.948
10/11/85	1112	RM	4616.947
12/05/85	1055	RM	4616.961
12/12/85	1300	RM	4616.954
12/16/85	1128	RM	4616.964
12/23/85	1158	RM	4616.965

TABLE 4. (CONT.)

UPPER EAST RIFT ZONE AND SOUTH FLANK LINE LENGTH MEASUREMENTS

Line P10; LAVA CHANNEL to MAUNA ULU

DATE	TIME	INST.	DIST. (m)
01/02/86	1317	RM	4616.966
01/10/86	1137	RM	4616.964
01/29/86	1406	RM	4616.943
02/05/86	0934	RM	4616.949
02/13/86	1307	RM	4616.978
02/18/86	1004	RM	4616.995
02/20/86	1504	RM	4616.975
02/24/86	1108	RM	4616.977
03/07/86	1127	RM	4616.977
03/18/86	1100	RM	4616.974
03/25/86	1410	RM	4616.968
06/20/86	1118	RM	4616.978
09/22/86	1345	RM	4617.021
09/24/86	1313	RM	4617.018
10/29/86	1204	RM	4616.976
12/11/86	1001	RM	4616.989
02/04/87	1140	RM	4616.999
06/25/87	1107	RM	4617.031
08/25/87	1302	RM	4617.026
08/25/87	1315	RM	4617.021

Line P11; ESCAPE RD 95 to MAUNA ULU

DATE	TIME	INST.	DIST. (m)
06/04/82	1200	RM	2544.771
06/08/82	1011	RM	2544.784
06/15/82	1200	RM	2544.775
06/23/82	1334	RM	2544.794
07/13/82	1300	RM	2544.797
09/13/82	1000	RM	2544.790
10/06/82	1050	RM	2544.761
10/12/82	1541	RM	2544.776
11/05/82	1345	RM	2544.812
12/09/82	0853	RM	2544.781
01/02/83	1740	RM	2544.843
01/03/83	1602	RM	2544.813
01/04/83	1432	RM	2544.844
01/06/83	1244	RM	2544.873
01/09/83	1020	RM	2544.864
01/25/83	0943	RM	2544.906
05/19/83	1120	RM	2544.855
06/09/83	1319	RM	2544.894
08/08/83	1345	RM	2544.883
08/30/83	1456	RM	2544.873
09/12/83	1107	RM	2544.885
09/26/83	1130	RM	2544.862

Line P11; ESCAPE RD 95 to MAUNA ULU

DATE	TIME	INST.	DIST. (m)
11/17/83	1538	RM	2544.838
03/15/84	0954	RM	2544.904
06/14/84	1443	RM	2544.884
09/18/84	1550	RM	2544.868
12/14/84	1003	RM	2544.881
03/18/85	0846	RM	2544.876
03/28/85	1421	RM	2544.915
04/10/85	1001	RM	2544.892
06/03/85	0925	RM	2544.876
08/14/85	1145	RM	2544.881
10/10/85	1116	RM	2544.860
12/05/85	1011	RM	2544.877
12/12/85	1055	RM	2544.879
12/16/85	1056	RM	2544.896
12/23/85	1123	RM	2544.900
01/02/86	1445	RM	2544.854
01/03/86	1553	RM	2544.861
01/10/86	0920	RM	2544.846
01/29/86	1314	RM	2544.842
02/06/86	0916	RM	2544.854
02/13/86	1051	RM	2544.870
02/18/86	1035	RM	2544.863
02/20/86	1425	RM	2544.870
02/24/86	1240	RM	2544.882
03/07/86	1200	RM	2544.875
03/18/86	1000	RM	2544.857
03/25/86	1324	RM	2544.870
06/13/86	1056	RM	2544.894
09/22/86	1428	RM	2544.864
09/24/86	1400	RM	2544.847
10/29/86	1300	RM	2544.836
12/11/86	0914	RM	2544.840
02/04/87	1200	RM	2544.864
06/25/87	1021	RM	2544.899
08/25/87	1225	RM	2544.896

TABLE 5.

SOUTH FLANK HILINA PALI LINE LENGTH MEASUREMENTS

Line P15; HILINA to HLP1

DATE	TIME	INST.	DIST. (m)
07/20/82	1453	RM	3818.132
07/27/82	1608	RM	3818.155
08/26/82	1419	RM	3818.229
09/13/82	1159	RM	3818.190
09/28/82	1226	RM	3818.178
10/04/82	1500	RM	3818.154
10/12/82	1417	RM	3818.156
10/27/82	1343	RM	3818.168
11/05/82	1303	RM	3818.172
12/09/82	1025	RM	3818.197
02/22/83	1211	RM	3818.184
04/12/83	1332	RM	3818.175
04/26/83	1119	RM	3818.227
04/27/83	1200	RM	3818.214
05/19/83	1342	RM	3818.212
06/09/83	1236	RM	3818.219
08/08/83	1229	RM	3818.228
08/31/83	1410	RM	3818.197
09/09/83	1100	RM	3818.183
09/26/83	1216	RM	3818.165
10/21/83	1115	RM	3818.198
11/17/83	1405	RM	3818.166
11/18/83	1139	RM	3818.153
12/23/83	1400	RM	3818.149
02/06/84	0933	RM	3818.186
03/14/84	1400	RM	3818.162
06/12/84	1445	RM	3818.129
08/15/84	1427	RM	3818.167
09/18/84	1455	RM	3818.158
04/08/85	1106	RM	3818.182
05/23/85	0937	RM	3818.186
06/12/85	1147	RM	3818.201
08/14/85	1032	RM	3818.192
10/10/85	1210	RM	3818.200
01/02/86	1122	RM	3818.187
01/30/86	1223	RM	3818.202
10/24/86	1159	RM	3818.176
12/11/86	1422	RM	3818.174
02/10/87	1540	RM	3818.187
06/22/87	1525	RM	3818.209
06/22/87	1536	RM	3818.211
08/25/87	1515	RM	3818.216

Line P16; HILINA to HLP2

DATE	TIME	INST	DIST. (m)
07/20/82	1504	RM	3771.136
07/27/82	1603	RM	3771.148
08/26/82	1425	RM	3771.200
09/13/82	1156	RM	3771.182
09/28/82	1223	RM	3771.153
10/04/82	1540	RM	3771.154
10/12/82	1415	RM	3771.143
10/27/82	1341	RM	3771.160
11/05/82	1300	RM	3771.167
12/09/82	1020	RM	3771.178
02/22/83	1214	RM	3771.186
04/12/83	1329	RM	3771.168
04/26/83	1122	RM	3771.223
04/27/83	1200	RM	3771.218
05/19/83	1340	RM	3771.200
06/08/83	1236	RM	3771.220
08/08/83	1225	RM	3771.245
08/31/83	1405	RM	3771.197
09/09/83	1110	RM	3771.183
09/26/83	1215	RM	3771.192
10/21/83	1119	RM	3771.236
11/17/83	1403	RM	3771.175
11/18/83	1139	RM	3771.163
12/23/83	1355	RM	3771.153
02/06/84	0930	RM	3771.192
03/14/84	1353	RM	3771.152
06/12/84	1438	RM	3771.165
08/15/84	1425	RM	3771.150
09/18/84	1457	RM	3771.150
10/19/84	1500	RM	3771.182
12/14/84	0904	RM	3771.194
02/25/85	1133	RM	3771.185
03/18/85	1330	RM	3771.187
04/08/85	1102	RM	3771.191
05/23/85	0934	RM	3771.175
06/12/85	1154	RM	3771.187
08/14/85	1039	RM	3771.196
10/10/85	1212	RM	3771.193
01/02/86	1126	RM	3771.186
01/30/86	1226	RM	3771.200
08/05/86	1115	RM	3771.193
10/24/86	1101	RM	3771.182
12/11/86	1426	RM	3771.167
02/10/87	1545	RM	3771.187
06/22/87	1527	RM	3771.201
08/25/87	1518	RM	3771.215

TABLE 5. (CONT.)

SOUTH FLANK HILINA PALI LINE LENGTH MEASUREMENTS

Line P17; HILINA to HLP3

DATE	TIME	INST.	DIST. (m)
07/20/82	1530	RM	3246.312
07/27/82	1610	RM	3246.335
08/26/82	1430	RM	3246.395
09/13/82	1155	RM	3246.350
09/28/82	1227	RM	3246.342
10/04/82	1537	RM	3246.333
10/12/82	1412	RM	3246.342
10/27/82	1339	RM	3246.339
11/05/82	1256	RM	3246.346
12/09/82	1015	RM	3246.366
02/22/83	1209	RM	3246.345
04/12/83	1335	RM	3246.342
04/26/83	1115	RM	3246.405
04/27/83	1200	RM	3246.394
05/19/83	1335	RM	3246.378
06/09/83	1233	RM	3246.404
08/08/83	1222	RM	3246.401
08/31/83	1402	RM	3246.377
09/26/83	1212	RM	3246.350
10/21/83	1105	RM	3246.417
11/17/83	1400	RM	3246.334
11/18/83	1133	RM	3246.324
12/23/83	1350	RM	3246.320
02/06/84	0927	RM	3246.359
03/14/84	1356	RM	3246.323
06/12/84	1435	RM	3246.314
08/15/84	1423	RM	3246.339
09/18/84	1500	RM	3246.320
10/19/84	1500	RM	3246.346
12/14/84	0901	RM	3246.354
02/25/85	1140	RM	3246.352
03/18/85	1323	RM	3246.362
04/08/85	1057	RM	3246.351
05/23/85	0931	RM	3246.353
06/12/85	1202	RM	3246.351
08/14/85	1043	RM	3246.348
10/10/85	1216	RM	3246.373
01/02/86	1130	RM	3246.346
01/30/86	1230	RM	3246.352
10/24/86	1104	RM	3246.350
12/11/86	1431	RM	3246.348
02/10/87	1547	RM	3246.352
06/22/87	1530	RM	3246.369
08/25/87	1520	RM	3246.374

Line P18; HILINA to HLP4

DATE	TIME	INST.	DIST. (m)
07/20/82	1545	RM	2366.903
07/27/82	1556	RM	2366.923
08/26/82	1426	RM	2366.943
09/13/82	1153	RM	2366.948
09/28/82	1217	RM	2366.926
10/04/82	1532	RM	2366.914
10/12/82	1401	RM	2366.919
10/27/82	1336	RM	2366.931
11/05/82	1254	RM	2366.937
12/09/82	1009	RM	2366.969
02/22/83	1205	RM	2366.942
04/12/83	1337	RM	2366.932
04/26/83	1112	RM	2366.986
04/27/83	1200	RM	2366.976
05/19/83	1332	RM	2366.952
06/09/83	1226	RM	2366.975
08/08/83	1218	RM	2366.994
08/31/83	1357	RM	2366.944
09/09/83	1112	RM	2366.933
09/26/83	1208	RM	2366.927
10/21/83	1100	RM	2367.007
11/17/83	1358	RM	2366.929
11/18/83	1130	RM	2366.918
12/23/83	1345	RM	2366.917
02/06/84	0922	RM	2366.941
03/14/84	1350	RM	2366.911
06/12/84	1430	RM	2366.924
08/15/84	1418	RM	2366.931
09/18/84	1502	RM	2366.916
10/19/84	1500	RM	2366.952
12/14/84	0852	RM	2366.947
02/25/85	1145	RM	2366.955
03/18/85	1320	RM	2366.943
04/08/85	1053	RM	2366.942
05/23/85	0922	RM	2366.935
06/12/85	1210	RM	2366.933
08/14/85	1047	RM	2366.929
10/10/85	1222	RM	2366.936
01/02/86	1134	RM	2366.940
01/30/86	1236	RM	2366.945
08/05/86	1115	RM	2366.939
10/24/86	1114	RM	2366.938
12/11/86	1437	RM	2366.954
02/10/87	1550	RM	2366.937
06/22/87	1533	RM	2366.943
08/25/87	1524	RM	2366.959
08/25/87	1527	RM	2366.952

TABLE 6.

SOUTH FLANK HOLEI PALI MONITOR LINE LENGTH MEASUREMENTS

Line P34; HVO162 to HOLEI#1

DATE	TIME	INST.	DIST. (m)
09/26/86	1158	RM	3717.344
10/29/86	1050	RM	3717.368
12/11/86	1304	RM	3717.330
02/04/87	1300	RM	3717.378
06/22/87	1420	RM	3717.399
06/22/87	1431	RM	3717.396
08/25/87	1416	RM	3717.395
09/08/87	1303	RM	3717.382
09/09/87	1129	RM	3717.387

Line P35; HVO162 to HOLEI#2

DATE	TIME	INST.	DIST. (m)
09/26/86	1254	RM	2675.004
10/29/86	1056	RM	2675.019
12/11/86	1308	RM	2674.996
02/04/87	1305	RM	2675.035
06/22/87	1415	RM	2675.060
08/25/87	1418	RM	2675.054
09/08/87	1305	RM	2675.036
09/09/87	1131	RM	2675.047

Line P36; HVO162 to HOLEI#3

DATE	TIME	INST.	DIST. (m)
09/26/86	1336	RM	2030.286
10/29/86	1102	RM	2030.297
12/11/86	1315	RM	2030.290
02/04/87	1312	RM	2030.294
06/22/87	1411	RM	2030.326
08/25/87	1420	RM	2030.319
09/08/87	1310	RM	2030.312
09/09/87	1134	RM	2030.315

Line P37; HVO162 to HOLEI#4

DATE	TIME	INST.	DIST. (m)
09/26/86	1444	RM	0500.744
10/29/86	1108	RM	0500.726
12/11/86	1323	RM	0500.753
02/04/87	1325	RM	0500.749
06/22/87	1425	RM	0500.771
08/25/87	1423	RM	0500.753
09/08/87	1314	RM	0500.748
09/09/87	1137	RM	0500.754

TABLE 7.

SOUTH FLANK KALAPANA LINE LENGTH MEASUREMENTS

Line 22P; PAINTED CHURCH to FLOW77-1

DATE	TIME	INST.	DIST. (m)
12/17/82	1246	RM	5866.648
01/12/83	1608	RM	5866.642
01/14/83	1604	RM	5866.640
01/16/83	1030	RM	5866.659
01/21/83	1000	RM	5866.654
01/24/83	1300	RM	5866.634
01/28/83	1055	RM	5866.690
02/01/83	1202	RM	5866.668
02/04/83	1259	RM	5866.653
02/15/83	1040	RM	5866.639
02/25/83	1103	RM	5866.656
03/22/83	1200	RM	5866.667
04/25/83	1200	RM	5866.662
05/25/83	1052	RM	5866.639
06/22/83	1150	RM	5866.678
08/09/83	1115	RM	5866.675
08/27/83	1530	RM	5866.659
08/28/83	0850	RM	5866.662
08/30/83	1352	RM	5866.650
09/08/83	1144	RM	5866.663
09/09/83	0950	RM	5866.652
09/13/83	1320	RM	5866.671
09/16/83	0945	RM	5866.665
09/22/83	1137	RM	5866.697
09/26/83	0952	RM	5866.682
09/27/83	0937	RM	5866.663
10/31/83	1450	RM	5866.656
11/21/83	1208	RM	5866.691
01/30/84	1129	RM	5866.661
03/01/84	1230	RM	5866.657
03/15/84	1215	RM	5866.677
06/14/84	1135	RM	5866.697
08/20/84	1100	RM	5866.729
09/18/84	1235	RM	5866.710
12/14/84	1154	RM	5866.733
03/18/85	1150	RM	5866.721
04/02/85	1150	RM	5866.725
04/09/85	1012	RM	5866.735
06/03/85	1413	RM	5866.692
08/14/85	1327	RM	5866.745
12/05/85	1220	RM	5866.734
12/16/85	1257	RM	5866.742
12/23/85	1316	RM	5866.702
01/10/86	1027	RM	5866.752
01/30/86	1422	RM	5866.726
06/23/86	1021	RM	5866.730
10/10/86	1009	RM	5866.730
12/12/86	1205	RM	5866.755

Line 22P; PAINTED CHURCH to FLOW77-1

DATE	TIME	INST.	DIST. (m)
02/19/87	1000	RM	5866.747
06/23/87	0800	RM	5866.794
09/23/87	0840	RM	5866.812
09/23/87	0900	RM	5866.769

Line 23P; PAINTED CHURCH to FLOW77-2

DATE	TIME	INST.	DIST. (m)
12/17/82	1325	RM	4526.360
01/02/83	1238	RM	4526.396
01/02/83	1342	RM	4526.373
01/02/83	1416	RM	4526.368
01/02/83	1442	RM	4526.398
01/02/83	1458	RM	4526.370
01/02/83	1548	RM	4526.365
01/06/83	1132	RM	4526.391
01/09/83	1135	RM	4526.361
01/12/83	1617	RM	4526.336
01/14/83	1609	RM	4526.344
01/16/83	1034	RM	4526.362
01/21/83	1000	RM	4526.359
01/24/83	1305	RM	4526.339
01/28/83	1059	RM	4526.387
02/01/83	1206	RM	4526.391
02/04/83	1255	RM	4526.360
02/15/83	1050	RM	4526.348
02/25/83	1107	RM	4526.369
03/07/83	1323	RM	4526.359
03/09/83	1330	RM	4526.353
03/22/83	1200	RM	4526.379
04/25/83	1200	RM	4526.381
05/25/83	1049	RM	4526.347
06/22/83	1153	RM	4526.371
08/09/83	1117	RM	4526.371
08/27/83	1540	RM	4526.371
08/28/83	0855	RM	4526.384
08/30/83	1357	RM	4526.348
09/08/83	1146	RM	4526.375
09/09/83	1000	RM	4526.373
09/13/83	1325	RM	4526.370
09/16/83	0949	RM	4526.384
09/22/83	1133	RM	4526.401
09/26/83	0949	RM	4526.380
09/27/83	0941	RM	4526.365
10/31/83	1447	RM	4526.356
11/21/83	1213	RM	4526.395

TABLE 7. (CONT.)

SOUTH FLANK KALAPANA LINE LENGTH MEASUREMENTS

Line 23P; PAINTED CHURCH to FLOW77-2

DATE	TIME	INST.	DIST. (m)
01/30/84	1126	RM	4526.350
03/01/84	1233	RM	4526.366
03/15/84	1207	RM	4526.380
06/14/84	1130	RM	4526.385
08/20/84	1055	RM	4526.420
09/18/84	1233	RM	4526.428
12/14/84	1150	RM	4526.426
03/18/85	1200	RM	4526.398
04/02/85	1146	RM	4526.427
04/09/85	1009	RM	4526.423
06/03/85	1420	RM	4526.414
08/14/85	1323	RM	4526.433
12/05/85	1222	RM	4526.416
12/16/85	1301	RM	4526.435
12/23/85	1319	RM	4526.399
01/10/86	1031	RM	4526.433
01/30/86	1414	RM	4526.438
06/13/86	1303	RM	4526.412
06/20/86	1325	RM	4526.417
06/23/86	1026	RM	4526.405
10/10/86	1018	RM	4526.396
12/12/86	1208	RM	4526.449
02/19/87	1012	RM	4526.445
06/23/87	0803	RM	4526.467
09/23/87	0846	RM	4526.459
09/23/87	0904	RM	4526.456

Line 25P; PAINTED CHURCH to FLOW77-4

DATE	TIME	INST.	DIST. (m)
10/10/86	1026	RM	3295.118
02/19/87	1018	RM	3295.131
06/23/87	0806	RM	3295.143
09/23/87	0851	RM	3295.149
09/23/87	0908	RM	3295.145

TABLE 8.

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

Summit

Line P04*; HVO113 to KALP4

DATE	TIME	INST.	DIST. (m)
06/02/82	1200	RM	2016.924
06/08/82	0905	RM	2016.941
06/15/82	1200	RM	2016.939
06/18/82	0928	RM	2016.921
06/22/82	1526	RM	2016.931
06/23/82	1128	RM	2016.873
06/24/82	1134	RM	2016.833
06/25/82	1347	RM	2016.812
06/29/82	1200	RM	2016.821
07/09/82	1145	RM	2016.807
07/13/82	1124	RM	2016.853
07/19/82	1139	RM	2016.862
07/30/82	1230	RM	2016.865
08/04/82	0831	RM	2016.853
08/26/82	1306	RM	2016.897
09/25/82	2114	RM	2016.659
09/25/82	2134	RM	2016.666
09/25/82	2144	RM	2016.618
09/25/82	2149	RM	2016.657
09/25/82	2317	RM	2016.661
09/26/82	0034	RM	2016.663
09/26/82	0428	RM	2016.657
09/26/82	0530	RM	2016.663
09/26/82	0554	RM	2016.654
09/26/82	0615	RM	2016.655
09/26/82	0840	RM	2016.657
09/26/82	0954	RM	2016.670
09/26/82	1019	RM	2016.654
09/26/82	1046	RM	2016.664
09/26/82	1117	RM	2016.663
09/27/82	1254	RM	2016.672
09/28/82	1335	RM	2016.674
09/29/82	1433	RM	2016.695
09/30/82	1604	RM	2016.692
10/01/82	0923	RM	2016.686
10/04/82	1335	RM	2016.698
10/05/82	1432	RM	2016.680
10/06/82	1350	RM	2016.700
10/12/82	1310	RM	2016.680
10/21/82	1446	RM	2016.691
10/27/82	0933	RM	2016.679
11/05/82	1120	RM	2016.690
11/12/82	1114	RM	2016.674
11/17/82	1337	RM	2016.669
11/30/82	1119	RM	2016.706
12/06/82	1200	RM	2016.719

Line P04*; HVO113 to KALP4

DATE	TIME	INST.	DIST. (m)
12/09/82	1109	RM	2016.711
12/09/82	1945	RM	2016.696
12/09/82	2007	RM	2016.707
12/09/82	2036	RM	2016.706
12/11/82	0858	RM	2016.711
12/17/82	0835	RM	2016.715
01/02/83	0302	RM	2016.723
01/02/83	1012	RM	2016.708
01/02/83	1715	RM	2016.651
01/03/83	1504	RM	2016.575
01/04/83	1525	RM	2016.608
01/06/83	1344	RM	2016.503
01/09/83	0935	RM	2016.487
01/25/83	0858	RM	2016.530
02/15/83	1111	RM	2016.575
02/22/83	1040	RM	2016.567
03/07/83	1509	RM	2016.549
03/11/83	1130	RM	2016.550
03/14/83	1257	RM	2016.569
04/12/83	1058	RM	2016.506
04/25/83	1200	RM	2016.529
05/10/83	1426	RM	2016.595
05/16/83	1343	RM	2016.564
05/19/83	1155	RM	2016.554
05/31/83	1133	RM	2016.580
06/09/83	1101	RM	2016.616
06/20/83	1115	RM	2016.582
07/27/83	1200	RM	2016.561
07/29/83	1200	RM	2016.592
08/08/83	1030	RM	2016.603
08/30/83	1535	RM	2016.584
09/08/83	1249	RM	2016.549
09/26/83	1313	RM	2016.551
10/21/83	1454	RM	2016.546
10/31/83	1201	RM	2016.583
11/01/83	1436	RM	2016.566
11/08/83	1019	RM	2016.565
11/09/83	1200	G8	2016.565
11/17/83	1058	RM	2016.573
11/18/83	1529	RM	2016.577
11/21/83	0955	RM	2016.582
12/02/83	1045	RM	2016.541
12/22/83	1112	RM	2016.618

TABLE 8. (CONT.)

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

Summit

Line 9AP*; HVO113 to KEANAPERM

DATE	TIME	INST.	DIST. (m)
04/30/82	1241	RM	2937.617
04/30/82	1250	RM	2937.622
04/30/82	1257	RM	2937.618
04/30/82	1305	RM	2937.623
04/30/82	1312	RM	2937.623
04/30/82	1316	RM	2937.619
04/30/82	1332	RM	2937.617
04/30/82	1340	RM	2937.619
04/30/82	1401	RM	2937.620
04/30/82	1417	RM	2937.625
05/01/82	0332	RM	2937.635
05/01/82	0408	RM	2937.641
05/01/82	0432	RM	2937.639
05/01/82	0445	RM	2937.639
05/01/82	0501	RM	2937.637
05/01/82	0531	RM	2937.637
05/01/82	0628	RM	2937.644
05/01/82	0723	RM	2937.645
05/03/82	1151	RM	2937.647

Southwest Rift Zone

Line P12**; FOOTPRINTS to KAMAKAIA

DATE	TIME	INST.	DIST. (m)
03/02/81	1527	G8	7018.648
03/09/81	0934	G8	7018.669
03/17/81	0846	G8	7018.659
04/02/81	1052	G8	7018.663
04/14/81	0945	G8	7018.700
04/14/81	1018	G8	7018.682
04/28/81	0925	G8	7018.679
05/14/81	0900	RM	7018.990
06/09/81	1015	RM	7019.006
06/30/81	1200	RM	7018.996
08/11/81	1410	RM	7019.584
08/28/81	1200	RM	7019.671
12/03/81	1040	RM	7019.655
02/25/82	1355	RM	7019.597
06/02/82	1200	RM	7019.634
06/23/82	1049	RM	7019.634
06/24/82	1053	RM	7019.687
06/24/82	1452	RM	7019.692
06/25/82	1430	RM	7019.712
07/09/82	1055	RM	7019.719

Southwest Rift Zone

Line P12**; FOOTPRINTS to KAMAKAIA

DATE	TIME	INST.	DIST. (m)
07/13/82	0937	RM	7019.717
07/19/82	0956	RM	7019.714
08/03/82	1304	RM	7019.704
09/28/82	1100	RM	7019.701
10/12/82	1115	RM	7019.727
11/17/82	1140	RM	7019.726
03/14/84	1210	RM	7019.484
06/13/84	1105	RM	7019.481
09/18/84	0900	RM	7019.525

Line P13**; HVO160 to KAMAKAIA

DATE	TIME	INST.	DIST. (m)
03/02/81	1422	G8	4565.620
03/09/81	1010	G8	4565.620
03/17/81	0930	G8	4565.620
03/17/81	1200	G8	4565.621
04/02/81	1137	G8	4565.631
04/14/81	1105	G8	4565.630
04/14/81	1115	G8	4565.632
04/28/81	0954	G8	4565.652
05/14/81	0937	RM	4565.877
06/09/81	1120	RM	4565.877
06/30/81	1030	RM	4565.884
08/11/81	1440	RM	4565.958
08/28/81	1200	RM	4565.998
12/03/81	1105	RM	4566.010
02/25/82	1105	RM	4565.933
06/02/82	1200	RM	4565.982
06/02/82	1240	RM	4566.001
06/23/82	1028	RM	4565.980
06/24/82	1030	RM	4566.008
06/24/82	1320	RM	4565.997
06/25/82	1136	RM	4566.009
06/29/82	1107	RM	4566.007
07/09/82	1200	RM	4566.007
07/13/82	0921	RM	4566.031
07/19/82	0940	RM	4566.014
08/03/82	1328	RM	4565.993
08/26/82	1058	RM	4566.009
09/28/82	1039	RM	4565.974
10/12/82	1100	RM	4566.016
11/17/82	1120	RM	4566.011
03/14/84	1149	RM	4566.048

TABLE 8. (CONT.)

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

Southwest Rift Zone

Line P13**; HVO160 to KAMAKAIA

DATE	TIME	INST.	DIST. (m)
06/13/84	1042	RM	4566.077
09/18/84	0833	RM	4566.074

Line P14**; LACY to KAMAKAIA

DATE	TIME	INST.	DIST. (m)
06/07/82	1128	RM	13300.986
06/22/82	1050	RM	13301.042
06/23/82	0930	RM	13301.048
06/24/82	0949	RM	13301.048
06/24/82	1412	RM	13301.050
06/25/82	1457	RM	13301.061
07/09/82	0945	RM	13301.081
07/13/82	1014	RM	13301.061
07/19/82	1033	RM	13301.075
08/26/82	1158	RM	13301.059
09/17/82	1030	RM	13301.091
09/21/82	0900	RM	13301.087
09/28/82	1000	RM	13301.075
10/04/82	1122	RM	13301.106
10/12/82	1147	RM	13301.073
11/05/82	1037	RM	13301.093
11/17/82	1020	RM	13301.122
12/06/82	1415	RM	13301.082
02/22/83	0925	RM	13301.025
03/14/84	1014	RM	13300.929
06/13/84	0908	RM	13300.914

Middle East Rift and South Flank

Line 1P*; 79-530 to KM-2N

DATE	TIME	INST.	DIST. (m)
06/06/79	1200	G8	1519.344
10/10/79	0916	G8	1519.341
06/12/80	1150	G8	1519.349
11/03/80	0929	G8	1519.364
09/22/82	1008	RM	1519.339

Middle East Rift and South Flank

Line 2P*; 79-530 to KM-1N

DATE	TIME	INST.	DIST. (m)
06/06/79	1200	G8	520.557
10/10/79	0930	G8	520.548
06/12/80	1148	G8	520.552
11/03/80	0940	G8	520.578
09/22/82	1006	RM	520.559

Line 3P*; 79-530 to KM-1S

DATE	TIME	INST.	DIST. (m)
06/06/79	1200	G8	414.647
10/10/79	1200	G8	414.651
06/12/80	1206	G8	414.666
11/03/80	0948	G8	414.697
09/22/82	0950	RM	414.659
01/19/83	1200	RM	414.722
01/26/83	0908	RM	414.729

Line 4P*; 79-530 to KM-2S

DATE	TIME	INST.	DIST. (m)
06/06/79	1200	G8	1122.763
10/10/79	0954	G8	1122.755
06/12/80	1212	G8	1122.773
11/03/80	0957	G8	1122.796
09/22/82	0955	RM	1122.719
01/19/83	1200	RM	1122.571

Line 5P*; 79-530 to KM-3S

DATE	TIME	INST.	DIST. (m)
06/06/79	1542	G8	1590.302
10/10/79	1008	G8	1590.278
06/12/80	1225	G8	1590.314
11/03/80	1005	G8	1590.335
09/22/82	1000	RM	1590.228
01/19/83	1200	RM	1589.979

TABLE 8. (CONT.)

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

Middle East Rift and South Flank

Line 6P*; KALALUA to K-1

DATE	TIME	INST.	DIST. (m)
06/06/79	1200	HP	480.995
10/10/79	1104	G8	481.007
06/12/80	0915	G8	481.005
11/03/80	1137	G8	481.006
09/22/82	1035	RM	480.969
01/01/83	1254	RM	480.987
01/05/83	1053	RM	481.006
01/05/83	1120	RM	480.990
01/05/83	1131	RM	480.987
01/05/83	1201	RM	480.988
01/05/83	1225	RM	480.988
01/05/83	1339	RM	480.984
01/05/83	1628	RM	480.995
01/05/83	1653	RM	480.993
01/07/83	1100	RM	480.819
01/07/83	1143	RM	480.821
01/11/83	0738	RM	480.655
01/12/83	1159	RM	480.628
01/17/83	1410	RM	480.604
01/19/83	1200	RM	480.609
01/26/83	0947	RM	480.597
02/04/83	0938	RM	480.599
02/23/83	0900	RM	480.599
03/08/83	0914	RM	480.588
03/22/83	1200	RM	480.589
03/28/83	1200	RM	480.596

Line 7P*; KALALUA to K-2

DATE	TIME	INST.	DIST. (m
06/06/79	1200	HP	818.201
10/10/79	1053	G8	818.218
06/12/80	0922	G8	818.218
11/03/80	1129	G8	818.234
09/22/82	1042	RM	818.186
01/05/83	1051	RM	818.222
01/05/83	1118	RM	818.196
01/05/83	1129	RM	818.196
01/05/83	1159	RM	818.196
01/05/83	1228	RM	818.194
01/05/83	1252	RM	818.203
01/05/83	1341	RM	818.201
01/05/83	1625	RM	818.212

Line 7P*; KALALUA to K-2

DATE	TIME	INST.	DIST. (m)
01/05/83	1650	RM	818.208
01/07/83	1142	RM	820.035
01/07/83	1158	RM	820.006
01/11/83	0734	RM	820.371
01/12/83	1157	RM	820.370
01/17/83	1408	RM	820.361
01/19/83	1200	RM	820.365
01/26/83	0945	RM	820.371
02/04/83	0936	RM	820.382
02/23/83	0857	RM	820.384
03/08/83	0912	RM	820.377
03/22/83	1200	RM	820.382
03/28/83	1200	RM	820.392
05/04/83	1200	RM	820.375
06/02/83	1200	RM	820.370
08/22/83	1030	RM	820.369
10/14/83	1005	RM	820.356
12/23/83	0932	RM	820.364
01/10/84	1121	RM	820.365

Line 8P*; KALALUA to K-3

DATE	TIME	INST.	DIST. (m)
06/06/79	1129	G8	969.679
06/06/79	1200	HP	969.675
10/10/79	1200	G8	969.688
06/12/80	0934	G8	969.685
11/03/80	1138	G8	969.726
09/22/82	1044	RM	969.655
01/05/83	1049	RM	969.701
01/05/83	1116	RM	969.697
01/05/83	1128	RM	969.686
01/05/83	1158	RM	969.690
01/05/83	1230	RM	969.695
01/05/83	1250	RM	969.696
01/05/83	1342	RM	969.688
01/05/83	1623	RM	969.710
01/05/83	1648	RM	969.701
01/07/83	1103	RM	971.471
01/07/83	1150	RM	971.499
01/11/83	0727	RM	971.793
01/12/83	1152	RM	971.783
01/17/83	1406	RM	971.787

TABLE 8. (CONT.)

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

Middle East Rift and South Flank

Line 8P*; KALALUA to K-3

DATE	TIME	INST.	DIST. (m)
01/19/83	1200	RM	971.788
01/26/83	0943	RM	971.786
02/04/83	0934	RM	971.804
02/23/83	0855	RM	971.805
03/08/83	0909	RM	971.799
03/22/83	1200	RM	971.788
03/28/83	1200	RM	971.811
05/04/83	1200	RM	971.780
06/02/83	1200	RM	971.790
08/22/83	1028	RM	971.776
10/14/83	1002	RM	971.773
12/23/83	0930	RM	971.779
01/10/84	1127	RM	971.787

Line 9P**; KALALUA to KIAI

DATE	TIME	INST.	DIST. (m)
06/06/79	1105	G8	1496.012
10/10/79	1113	G8	1496.027
06/12/80	1200	G8	1496.067
11/30/80	1143	G8	1496.044
01/05/83	1056	RM	1496.059
01/05/83	1100	RM	1496.034
01/05/83	1115	RM	1496.014
01/05/83	1125	RM	1496.027
01/05/83	1155	RM	1496.018
01/05/83	1232	RM	1496.008
01/05/83	1258	RM	1496.022
01/05/83	1335	RM	1496.020
01/05/83	1630	RM	1496.004
01/05/83	1648	RM	1496.001
01/12/83	1201	RM	1496.004
01/17/83	1415	RM	1496.005
01/19/83	1200	RM	1496.008
01/26/83	0949	RM	1496.012
02/04/83	0932	RM	1495.999
02/23/83	0903	RM	1496.020
03/08/83	0916	RM	1496.010
03/22/83	1200	RM	1496.019
03/28/83	1200	RM	1496.005
05/04/83	1200	RM	1496.013
06/02/83	1200	RM	1496.008
08/22/83	1025	RM	1496.002
10/14/83	1007	RM	1496.016
12/23/83	0935	RM	1496.010

Line 10P*; KIAI K-2 to PK-N1

DATE	TIME	INST.	DIST. (m)
06/06/79	1307	G8	442.991
10/10/79	1200	G8	442.995
06/10/80	1200	G8	443.027
11/03/80	1242	G8	443.037
09/22/82	1200	RM	443.024
01/07/83	1025	RM	443.136
01/11/83	0825	RM	443.197
01/12/83	1257	RM	443.207
01/17/83	1507	RM	443.191
01/19/83	1200	RM	443.202
01/26/83	1056	RM	443.188
02/04/83	1017	RM	443.196
02/23/83	0943	RM	443.201
03/08/83	0950	RM	443.204
03/22/83	1200	RM	443.213
03/28/83	1200	RM	443.210
05/04/83	1200	RM	443.212
06/02/83	1200	RM	443.202
08/22/83	1117	RM	443.199
10/14/83	1200	RM	443.209
12/23/83	1015	RM	443.233

Line 11P*; KIAI K-2 to PK-N2

DATE	TIME	INST.	DIST. (m)
06/06/79	1257	G8	620.380
10/10/79	1200	G8	620.379
06/10/80	1150	G8	620.399
11/03/80	1232	G8	620.432
09/22/82	1122	RM	620.406
01/07/83	1023	RM	620.545
01/11/83	0822	RM	620.941
01/12/83	1236	RM	620.945
01/17/83	1500	RM	620.944
01/19/83	1200	RM	620.943
01/26/83	1055	RM	620.942
02/04/83	1014	RM	620.951
02/23/83	0940	RM	620.949
03/08/83	0948	RM	620.948
03/22/83	1200	RM	620.963
03/28/83	1200	RM	620.958
05/04/83	1200	RM	620.956
06/02/83	1200	RM	620.952
08/22/83	1119	RM	620.954
10/14/83	0918	RM	620.957

TABLE 8. (CONT.)

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

Middle East Rift and South Flank

Line 12P*; KIAI K-2 to PK-N3

DATE	TIME	INST.	DIST. (m)
06/06/79	1237	G8	940.132
10/10/79	1200	G8	940.130
06/10/80	1144	G8	940.153
11/30/80	1221	G8	940.170
09/22/82	1125	RM	940.150
01/11/83	0815	RM	940.618
01/12/83	1232	RM	940.627
01/17/83	1503	RM	940.623
01/19/83	1200	RM	940.626
01/26/83	1052	RM	940.621
02/04/83	1010	RM	940.628
02/23/83	0937	RM	940.630
03/08/83	0947	RM	940.629
03/22/83	1200	RM	940.637
03/28/83	1200	RM	940.633
05/04/83	1200	RM	940.627
06/02/83	1200	RM	940.628

Line 13P**; KIAI K-2 to VENT A

DATE	TIME	INST.	DIST. (m)
06/06/79	1324	G8	1651.071
10/10/79	1200	G8	1651.067
06/10/80	1010	G8	1651.049
11/30/80	1251	G8	1651.028
09/22/82	1128	RM	1651.020
01/11/83	0855	RM	1650.925
01/12/83	1240	RM	1650.923
01/17/83	1510	RM	1650.930
01/19/83	1200	RM	1650.940
01/26/83	1059	RM	1650.930
02/04/83	1008	RM	1650.938
02/23/83	0935	RM	1650.935
03/08/83	0953	RM	1650.939
03/22/83	1200	RM	1650.946
03/28/83	1200	RM	1650.933
05/04/83	1300	RM	1650.924
06/02/83	1200	RM	1650.934
08/22/83	1107	RM	1650.947
10/14/83	0923	RM	1650.941
12/23/83	0945	RM	1650.966

Line 14P**; KIAI K-2 to PK-S1

DATE	TIME	INST.	DIST. (m)
06/06/79	1335	G8	390.651
10/10/79	1200	G8	390.646
06/10/80	1018	G8	390.617
11/03/80	1317	G8	390.614
09/22/82	1131	RM	390.557
01/07/83	1027	RM	390.596
01/11/83	0831	RM	390.541
01/12/83	1249	RM	390.545
01/17/83	1513	RM	390.529
01/19/83	1200	RM	390.545
01/26/83	1100	RM	390.540
02/04/83	1024	RM	390.531
02/23/83	0955	RM	390.537
03/08/83	1001	RM	390.527
03/22/83	1200	RM	390.542
03/28/83	1200	RM	390.546
05/04/83	1334	RM	390.519
06/02/83	1200	RM	390.541
08/22/83	1115	RM	390.539
10/14/83	0925	RM	390.516
12/23/83	0950	RM	390.531

Line 15P**; KIAI K-2 to PK-S2

DATE	TIME	INST.	DIST. (m)
06/06/79	1347	G8	563.788
10/10/79	1200	G8	563.786
06/10/80	1020	G8	563.757
11/03/80	1310	G8	563.753
09/22/82	1135	RM	563.694
01/07/83	1033	RM	563.735
01/11/83	0828	RM	563.677
01/12/83	1245	RM	563.677
01/17/83	1516	RM	563.668
01/19/83	1200	RM	563.676
01/26/83	1104	RM	563.670
02/04/83	1021	RM	563.669
02/23/83	0952	RM	563.678
03/08/83	0959	RM	563.663
03/22/83	1200	RM	563.672
03/28/83	1200	RM	563.683
05/04/83	1337	RM	563.659
06/02/83	1200	RM	563.674
08/22/83	1113	RM	563.677

TABLE 8. (CONT.)

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

Middle East Rift and South Flank

Line 15P**; KIAI K-2 to PK-S2

DATE	TIME	INST.	DIST. (m)
10/14/83	0930	RM	563.650
12/23/83	1000	RM	563.661

Line 16P**; KIAI K-2 to PK-S3

DATE	TIME	INST.	DIST. (m)
06/06/79	1413	G8	847.846
10/10/79	1200	G8	847.819
06/10/80	1131	G8	847.793
11/03/80	1302	G8	847.808
09/22/82	1138	RM	847.744
01/11/83	0848	RM	847.704
01/12/83	1252	RM	847.712
01/17/83	1518	RM	847.714
01/19/83	1200	RM	847.708
01/26/83	1106	RM	847.704
02/04/83	1019	RM	847.704
02/23/83	0948	RM	847.718
03/08/83	0955	RM	847.707
03/22/83	1200	RM	847.719
03/28/83	1200	RM	847.725
05/04/83	1340	RM	847.704
06/02/83	1200	RM	847.715
08/22/83	1110	RM	847.710
10/14/83	0934	RM	847.690
12/23/83	0955	RM	847.694

Shot 17P**; 79-536 to 79-532S

DATE	TIME	INST.	DIST. (m)
06/07/79	1200	G8	1326.107
10/22/79	1200	G8	1326.057
11/03/80	1531	G8	1326.104
09/22/82	1327	RM	1326.110
01/12/83	1435	RM	1326.128
01/19/83	1200	RM	1326.113
01/26/83	1226	RM	1326.107
02/04/83	1109	RM	1326.104
03/22/83	1200	RM	1326.118
08/22/83	1522	RM	1326.086
06/23/87	1015	RM	1326.156

Shot 19P**; 79-536 to 79-536S

DATE	TIME	INST.	DIST. (m)
06/07/79	1348	G8	696.571
10/22/79	1200	G8	696.559
11/03/80	1514	G8	696.568
09/22/82	1320	RM	696.579
01/12/83	1441	RM	696.575
01/19/83	1200	RM	696.591
01/26/83	1230	RM	696.584
02/04/83	1113	RM	696.592
03/22/83	1200	RM	696.583
08/22/83	1524	RM	696.594
06/23/87	1010	RM	696.608

Shot 20P**; 79-532 to PK-S3

DATE	TIME	INST.	DIST. (m)
06/07/79	1200	G8	1572.733
10/22/79	1200	G8	1572.732
11/03/80	1353	G8	1572.773
09/22/82	1223	RM	1572.726
01/11/83	1102	RM	1572.679
01/12/83	1350	RM	1572.691
01/19/83	1200	RM	1572.669
01/26/83	1139	RM	1572.674
02/04/83	1043	RM	1572.688
03/22/83	1200	RM	1572.686
08/22/83	1149	RM	1572.671
06/23/87	1151	RM	1572.638

Shot 21P**; 79-532 to 79-532S

DATE	TIME	INST.	DIST. (m)
06/07/79	1200	G8	443.261
10/22/79	1002	G8	443.256
11/03/80	1409	G8	443.294
09/22/82	1226	RM	443.250
01/11/83	1108	RM	443.259
01/12/83	1338	RM	443.271
01/19/83	1200	RM	443.280
01/26/83	1141	RM	443.275
02/04/83	1047	RM	443.256
03/22/83	1200	RM	443.266
08/22/83	1451	RM	443.276
06/23/87	1147	RM	443.272

TABLE 8. (CONT.)

INACTIVE(*) OR SELDOM-MEASURED(**) LINE LENGTH MEASUREMENTS

South Flank

Line 24P*; PAINTED CHURCH to FLOW77-3

DATE	TIME	INST.	DIST. (m)
12/17/82	1340	RM	3295.531
01/02/83	1245	RM	3295.571
01/02/83	1347	RM	3295.555
01/02/83	1420	RM	3295.546
01/02/83	1500	RM	3295.550
01/02/83	1545	RM	3295.538
01/02/83	1630	RM	3295.567
01/06/83	1136	RM	3295.565
01/09/83	1140	RM	3295.557
01/12/83	1621	RM	3295.511
01/14/83	1600	RM	3295.523
01/16/83	1037	RM	3295.524
01/21/83	1000	RM	3295.528
01/24/83	1308	RM	3295.523
01/28/83	1104	RM	3295.560
02/01/83	1210	RM	3295.549
02/04/83	1252	RM	3295.555
02/15/83	1057	RM	3295.535
02/25/83	1111	RM	3295.553
03/07/83	1320	RM	3295.544
03/09/83	1330	RM	3295.537
03/22/83	1200	RM	3295.565
04/25/83	1200	RM	3295.557
05/25/83	1046	RM	3295.547
06/22/83	1157	RM	3295.557
08/09/83	1120	RM	3295.549
08/27/83	1534	RM	3295.548
08/28/83	0900	RM	3295.583
08/30/83	1402	RM	3295.517
09/08/83	1150	RM	3295.556
09/09/83	1002	RM	3295.538
09/13/83	1330	RM	3295.553
09/16/83	0952	RM	3295.569
09/22/83	1131	RM	3295.571
09/26/83	0945	RM	3295.547
09/27/83	0944	RM	3295.547
10/31/83	1442	RM	3295.544
11/21/83	1217	RM	3295.556
01/30/84	1132	RM	3295.555
03/01/84	1239	RM	3295.551
03/15/84	1201	RM	3295.567
06/14/84	1121	RM	3295.548
08/20/84	1050	RM	3295.575
09/18/84	1248	RM	3295.574
12/14/84	1200	RM	3295.593
03/18/85	1148	RM	3295.555

Line 24P*; PAINTED CHURCH to FLOW77-3

DATE	TIME	INST.	DIST. (m)
04/02/85	1139	RM	3295.591
04/09/85	1005	RM	3295.579
06/03/85	1423	RM	3295.565
08/14/85	1311	RM	3295.604
12/05/85	1225	RM	3295.576
12/16/85	1305	RM	3295.582
12/23/85	1323	RM	3295.573
01/10/86	1036	RM	3295.581
01/30/86	1430	RM	3295.586

Line 66P*; QUEENS BATH to BM FORD

DATE	TIME	INST.	DIST. (m)
09/13/83	1115	RM	4526.772
09/16/83	0930	RM	4526.771
09/22/83	1110	RM	4526.737
09/27/83	0916	RM	4526.749
09/27/83	1011	RM	4526.753
10/31/83	1430	RM	4526.769
01/30/84	1058	RM	4526.761
03/01/84	1207	RM	4526.788
03/15/84	1124	RM	4526.803
06/14/84	1100	RM	4526.798
08/17/84	1200	RM	4526.781
08/20/84	1120	RM	4526.798
09/18/84	1320	RM	4526.796
12/14/84	1127	RM	4526.824
03/18/85	1000	RM	4526.854
04/02/85	1100	RM	4526.845
04/09/85	0944	RM	4526.805
06/03/85	1355	RM	4526.796
08/14/85	1347	RM	4526.812
12/05/85	1155	RM	4526.788
12/16/85	1325	RM	4526.796
12/23/85	1346	RM	4526.803
01/10/86	1057	RM	4526.800
01/30/86	1452	RM	4526.806
10/10/86	1145	RM	4526.801
12/11/86	1206	RM	4526.823
02/04/87	1355	RM	4526.857

APPENDIX I

KILAUEA PERMANENT-GLASS EDM STATIONS

Summit Cross-Caldera

HVO113 Instrument station (U.S. Geological Survey disk stamped "HVO113") located on rock outcrop at the western base of the Uwekahuna triangulation station approximately 170 m northeast of HVO.

KALP1 Reflector station located on top of Kalanaokuaiki Pali approximately 500 m west of HVO111 (Pali) EDM station, 8.5 km southeast of, and bearing 159 degrees from, the HVO113 instrument station. KALP1 station has three prisms mounted on a 1" diameter steel rod that extends approximately 0.4 m above the ground surface.

KALP7 Reflector station located in tephra on a high point approximately 50 m southeast of the face of a pali on the Koae fault zone, 7.3 km southeast of, and bearing 159 degrees from, the HVO113 instrument station. KALP7 station has two prisms mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

KALP2 Reflector station located approximately 50 m northeast of KALP2 instrument station (see summit quadrilateral). KALP2 station has two prisms mounted on a 1" diameter steel rod that extends approximately 0.6 m above the ground surface.

KALP3 Reflector station located on the southern edge of Kilauea caldera near the Crater Rim trail, 3.4 km southeast of, and bearing 159 degrees from, the HVO113 instrument station . KALP3 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

KALP6 Reflector station located approximately 100 m southeast of Halemaumau crater and 100 m northeast of the parking area near very heavy steaming vents (not visible from the Halemaumau overlook trail), 2.1 km southeast of, and bearing 159 degrees from, the HVO113 instrument station. KALP6 reflector station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

KILAUEA PERMANENT-GLASS EDM STATIONS

KALP5 Reflector station located approximately 120 m north of Halemaumau crater, 1.0 km southeast of, and bearing 159 degrees from, the HVO113 instrument station. Best access is from the Halemaumau trail near the 1982 vents. KALP5 reflector station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

KALP8 Reflector station located among low Aalii bushes 100 m west of Mauna Loa Strip Road, 2.35 miles from Highway 11, 3.2 km northwest of, and bearing 315 degrees from, the HVO113 instrument station. KALP8 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

KALP9 Reflector station located near the base of an Ohia tree on an old tumulus in open pasture land of the Dillingham ranch, 4.0 km north-northwest of, and bearing 339 degrees from, the HVO113 instrument station. KALP9 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

Summit Quadrilateral

HVO113 Instrument station (U.S. Geological Survey disk stamped "HVO113") located on rock outcrop at the western base of the Uwekahuna triangulation station approximately 170 m northeast of HVO.

WL Reflector station located approximately 150 m southeast of damaged Waldron's Ledge overlook along closed portion of Crater Rim Trail. WL station is 3.3 km east of and bearing 88 degrees from the HVO113 instrument station, 4.9 km northeast of and bearing 48 degrees from the SANDHILL instrument station, and 4.9 km north-northeast of and bearing 17 degrees from the KALP2 instrument station. WL station has three prisms (one to each of the instrument stations) mounted on a 3/4 " diameter steel rod that extends approximately 0.8 m above the ground surface.

SANDHILL Instrument station (U.S. Geological Survey disk marked "HVO119") located 3.0 km south of HVO on a ridge covered by ash and tephra deposits.

KILAUEA PERMANENT-GLASS EDM STATIONS

SANDHILL Reflector station located approximately 1.5 m west of HVO119 and the SANDHILL instrument station, 3.2 km south of and bearing 189 degrees from the HVO113 instrument station. SANDHILL station has one prism mounted on a 3/4 " diameter steel rod that extends approximately 0.8 m above the ground surface.

KALP2 Instrument station (U.S. Geological Survey disk stamped "KALP2") located approximately 2 km southwest of Keanakakoi Crater on the left side of the dirt road to AHUA EDM station (approximately 100 m after leaving a large sand wash).

KALP2 Reflector station located approximately 50 m northeast of KALP2 instrument station. KALP2 station has two prisms mounted on a 3/4" diameter steel rod that extends approximately 0.6 m above the ground surface.

Upper Southwest Rift Zone

LACY Instrument station (1" diameter steel rod extending 0.5 m above the ground surface) located on the 1st major fault scarp of the Kaoiki fault zone in Kapapala Ranch land.

SWP4 Reflector station located on the north side of large sand deposit next to a low Ohia tree on an old pahoehoe flow mostly covered by tephra deposits, 3.5 km southeast of and bearing 155 degrees from the LACY instrument station. SWP4 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

SWP5 Reflector station located approximately 0.5 km northeast of the BM AA EDM and drytilt station (approximately 20 m east of the 4-wheel drive road), 4.3 km southeast of and bearing 155 degrees from the LACY instrument station. SWP5 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

KILAUEA PERMANENT-GLASS EDM STATIONS

SWP7 Reflector station located approximately 1.3 km northeast of Puu Koae at the contact of 1974 lava and older prehistoric lava west of the steaming fissures, 6.6 km southeast of and bearing 155 degrees from the LACY instrument station. SWP7 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

SWP8 Reflector station located approximately 1.2 km northeast of Puu Koae on 1974 lava approximately 50 m east of the steaming fissures, 6.9 km southeast of and bearing 155 degrees from the LACY instrument station. SWP8 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

SWP2 Reflector station located approximately 1.5 km east-southeast of Puu Koae on 1974 lava, 7.9 km southeast of and bearing 155 degrees from the LACY instrument station. SWP2 is approximately 100 m north of the trail that runs from the Hilina Pali road to Highway 11 and approximately 30 m west of the contact between the 1974 lava and prehistoric lavas. SWP2 station has two prisms mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

SWP9 Reflector station located on top of the next major fault scarp northwest of the Kalanokuaki Pali, approximately 2.1 km southeast of Puu Koae, 8.8 km southeast of and bearing 155 degrees from the LACY instrument station. SWP9 is approximately 150 m south of the trail that goes from the Hilina Pali road to Highway 11. SWP9 station has two prisms mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

SWP1 Reflector station located 50 m southeast of the Kalanaokuaki Pali fault scarp face, approximately 1.5 km west-northwest of Kipuka Nene, 10.0 km southeast of and bearing 155 degrees from the LACY instrument station. SWP1 is on a small tumulus next to a lone Ohia tree. SWP1 station has three prisms mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

KILAUEA PERMANENT-GLASS EDM STATIONS

Upper East Rift Zone

ESCAPE RD 95 Instrument station (U.S. Geological Survey disk stamped "ESCAPE RD 95") located 1.3 km northwest of Hiiaka Crater along the Escape Road. From the intersection of the Escape Road and the road to the Mauna Ulu parking lot, go 1.3 miles on the Escape Road to reach the station (1 m southwest of the road).

MAUNA ULU Reflector station located near the top of Mauna Ulu lava shield on the southeast side. Composed of two separate reflector stations - the northern (higher on the shield) station located 2.5 km southeast of and bearing 127 degrees from the ESCAPE RD 95 instrument station and the southern (lower) station located 4.6 km north of and bearing 0 degrees from the LAVA CHANNEL instrument station. Both stations have one prism mounted on a 1" diameter steel rod that extends approximately 0.3 m above the ground surface and are located approximately 10 m apart.

LAVA CHANNEL Instrument station (U.S. Geological Survey disk stamped "LAVA CHANNEL") located on top of a flat, broad accretionary lava ball (among a cluster of accretionary lava balls) on the west side of a 1974 Mauna Ulu lava channel and 150 m south of the Muliwai A Pele overlook.

APUA PERM Reflector station located on the Apua Point peninsula among low-lying Naupaka bushes approximately 30 m east of the southern-most coconut tree and seaward of the APUA PT. edm benchmark, 7.6 km south of and bearing 179 degrees from the LAVA CHANNEL instrument station. APUA PERM station has three prisms mounted on a 1" diameter steel rod that extends approximately 0.3 m above the ground surface.

South Flank (Hilina Pali)

HILINA Instrument station (U.S. Geological Survey disk stamped "HILINA") located 120 m south of the end of the Hilina Pali Road on a pahoehoe tumulus.

KILAUEA PERMANENT-GLASS EDM STATIONS

HLP1 Reflector station located near the ocean approximately 70 m south of waterhole (crack zone) and 200 m east of the Kaaha shelter, 3.8 km south of and bearing 163 degrees from the HILINA instrument station. HLP1 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

HLP2 Reflector station located 150 m north of HLP1, 3.7 km south of and bearing 163 degrees from the HILINA instrument station. HLP2 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

HLP3 Reflector station located on the Puu Kaone Pali approximately 20 m south of the trail from Kaaha to Halape, 3.2 km south of and bearing 163 degrees from the HILINA instrument station. HLP3 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

HLP4 Reflector station located approximately 70 m south of the trail from Hilina Pali to Kaaha, 2.3 km south of and bearing 163 degrees from the HILINA instrument station. HLP4 station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

South Flank (Holei Pali)

HVO162 Instrument station (U.S. Geological Survey disk stamped "HVO162") located on a tumulus 4 m south of the edge of the Chain of Craters Road and 0.4 mile before reaching the horseshoe curve on the way to Kalapana.

HOLEI#1 Reflector station located approximately 1 km south-southeast of HVO76 and Puu Loa Petroglyph sign on a flat pahoehoe tumulus, 100 m west of a lone Ohia tree, 3.7 km south of and bearing 174 degrees from the HVO162 instrument station. HOLEI#1 station has two prisms mounted on a 3/4" diameter steel rod that extends approximately 0.5 m above the ground surface.

KILAUEA PERMANENT-GLASS EDM STATIONS

HOLEI#2 Reflector station located approximately 90 m north of HVO76 and Puu Loa petroglyph sign next to a tumulus, 2.7 km south of and bearing 174 degree from the HVO162 instrument station. HOELI#2 station has one prism mounted on a 3/4 " diameter steel rod that extends approximately 0.5 m above the ground surface.

HOLEI#3 Reflector station located on the first fault scarp north of HOLEI#2 approximately 40-45 m north of an outstanding pointed tumulus, 2.0 km south of and bearing 174 degrees from the HVO162 instrument station. HOLEI#3 station has one prism mounted on a 3/4 " diameter steel rod that extends approximately 0.5 m above the ground surface.

HOLEI#4 Reflector station located approximately 170 m south of the Chain of Craters Road in a low area among A'alii bushes, grass, and Ohia trees, 0.5 km south of and bearing 174 degrees from the HVO162 instrument station. HOLEI#4 station has one prism mounted on a 3/4 " diameter steel rod that extends approximately 0.5 m above the ground surface.

South Flank (Kalapana)

PAINTED CHURCH Instrument station (PK nail)located on a pahoehoe outcrop fronting the Painted Church of Kalapana, approximately 6 m south of road.

FLOW77-1 Reflector station located on the eastern edge of the 1977 lava flow, 5.9 km northwest of and bearing 311 degrees from the PAINTED CHURCH instrument station. Four roads were constructed across the flow and the station is located approximately 100 m north of the second road (top road being #1). FLOW77-1 station has two prisms mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

FLOW77-2 Reflector station located on the 1977 lava flow between the second and third roads that crosses the 1977 flow (see FLOW77-1), 4.5 km northwest of and bearing 311 degrees from the PAINTED CHURCH instrument station. FLOW77-2 is located approximately 50 m west of small kipuka of Ohia trees. FLOW77-2 station has

one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

FLOW77-4 Reflector station located on the 1977 lava flow approximately 120 m south of the 4th road that crosses the 1977 flow (see FLOW77-1), 3.3 km northwest of and bearing 303 degrees from the PAINTED CHURCH instrument station. FLOW77-4 is located approximately 30 m from the western edge of the 1977 flow. FLOW77-4 station has 1 prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface. This station replaces reflector station FLOW77-3 which was disturbed and abandoned.

QUEENS BATH Instrument station (U.S. Geological Survey disk stamped "QUEENS BATH") located on a road cut south of Hwy. 130, approximately 100 m east of the access road to Royal Gardens Subdivision. Destroyed by lava flows in December 1986.

BMFORD Reflector station located on Episode 15 lava of the Puu O'o series in the Royal Gardens Subdivision approximately 100 m north of where the lava flow crossed Queen St. (north of a small lobe that blocks Queen St.), 4.5 km north of and bearing 0 degrees from the QUEENS BATH instrument station. BMFORD station has one prism mounted on a 1" diameter steel rod that extends approximately 0.5 m above the ground surface.

APPENDIX II

COORDINATES FOR ACTIVELY MEASURED KILAUEA PERMANENT-GLASS EDM STATIONS

STATION	LATITUDE (DEGREES N)	LONGITUDE (DEGREES W)
HVO113	19.4241	155.2896
KALP1	19.3527	155.2605
KALP2	19.3830	155.2729
KALP3	19.4071	155.2827
KALP5	19.4154	155.2860
KALP6	19.4060	155.2821
KALP7	19.3627	155.2646
KALP8	19.4446	155.3113
KALP9	19.4590	155.3031
WL	19.4259	155.2591
SANDHILL	19.3963	155.2941
LACY	19.4205	155.3425
SWP1	19.3387	155.3024
SWP2	19.3558	155.3109
SWP3	19.3701	155.3178
SWP4	19.3916	155.3283
SWP5	19.3850	155.3252
SWP6	19.3778	155.3217
SWP7	19.3658	155.3157
SWP8	19.3640	155.3149
SWP9	19.3484	155.3071
HILINA	19.2976	155.3100
HLP1	19.2637	155.3028
HLP2	19.2643	155.3029
HLP3	19.2689	155.3039
HLP4	19.2766	155.3055
ESCAPE RD 95	19.3842	155.2235
MAUNA ULU	19.3699	155.2035
LAVA CHANNEL	19.3290	155.1956
APUA PERM	19.2605	155.1955
HVO162	19.3173	155.1367
HOLEI#1	19.2839	155.1328
HOLEI#2	19.2933	155.1338
HOLEI#3	19.2991	155.1344
HOLEI#4	19.3128	155.1362
QUEENS BATH	19.3400	155.0217
BM FORD	19.3733	155.0350
PAINTED CHURCH	19.3539	154.9790
FLOW77-1	19.3903	155.0198
FLOW77-2	19.3823	155.0103
FLOW77-4	19.3730	155.0030