OPIC
OFFICE DE LA PROPRIÉTÉ INTELLECTUELLE DU CANADA

CIPO
CANADIAN INTELLECTUAL PROPERTY OFFICE

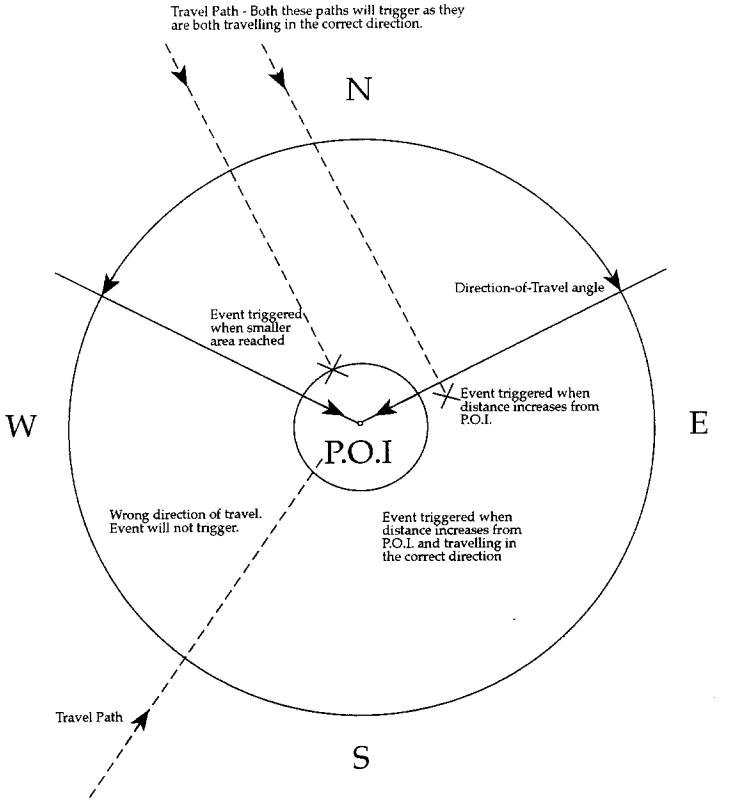
(12) (19) (CA) **Demande-Application**

(21) (A1) **2,237,117**
(86) 1996/11/08
(87) 1997/05/15

(72) SMALL, David, AU
(71) Q COMMUNICATIONS PTY LTD, AU

(51) Int.Cl.[6] G08G 1/0967, G08G 5/00, G08G 3/00
(30) 1995/11/09 (PN6476) AU

(54) **PROCEDE DE DECLENCHEMENT D'UN EVENEMENT**
(54) **A METHOD OF TRIGGERING AN EVENT**



(57) Cette invention concerne un procédé permettant de déclencher un événement à l'intérieur d'un appareil mobile. Ce procédé consiste à calculer la position dudit appareil, à calculer la distance entre la position calculée et un point préétabli, à armer l'appareil lorsque la distance calculée n'excède pas une distance d'armement préétablie et à déclencher l'événement soit lorsque la distance calculée n'excède pas une distance de déclenchement préétablie, soit lorsque la distance calculée augmente, soit lorsque la distance calculée n'est pas inférieure à la distance d'armement.

(57) A method of triggering an event in a mobile apparatus, the method including: calculating the position of the apparatus; calculating the distance between the calculated position and a predetermined point; arming the apparatus when the calculated distance is not more than a predetermined arming distance; and triggering the event when the calculated distance is not more than a predetermined triggering distance or triggering the event when the calculated distance increases or triggering the event when the calculated distance is not less than the arming distance.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G08G 1/0967, G01S 5/10 — A1

(11) International Publication Number: WO 97/17685

(43) International Publication Date: 15 May 1997 (15.05.97)

(21) International Application Number: PCT/AU96/00712

(22) International Filing Date: 8 November 1996 (08.11.96)

(30) Priority Data:
PN 6476 9 November 1995 (09.11.95) AU

(71) Applicant *(for all designated States except US)*: Q AUDIO (ACT) PTY. LTD. [AU/AU]; 4 Georgia Court, 1 Totterdell Street, Ginninderra Heights, ACT 2617 (AU).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: SMALL, David [AU/AU]; 4 Georgia Court, 1 Totterdell Street, Ginninderra Heights, ACT 2617 (AU).

(74) Agent: PIZZEYS PATENT & TRADEMARK ATTORNEYS; P.O. Box 291, Woden, ACT 2606 (AU).

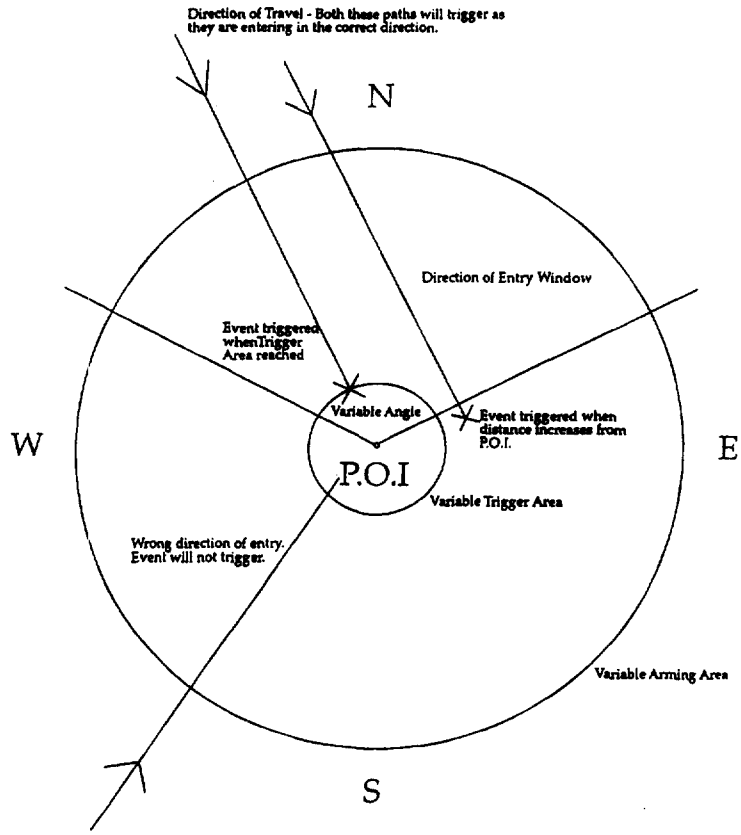
(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: A METHOD OF TRIGGERING AN EVENT

(57) Abstract

A method of triggering an event in a mobile apparatus, the method including: calculating the position of the apparatus; calculating the distance between the calculated position and a predetermined point; arming the apparatus when the calculated distance is not more than a predetermined arming distance; and triggering the event when the calculated distance is not more than a predetermined triggering distance or triggering the event when the calculated distance increases or triggering the event when the calculated distance is not less than the arming distance.



PCT/AU 96/00712
RECEIVED 2 DEC 1997

"A METHOD OF TRIGGERING AN EVENT"

TECHNICAL FIELD

This invention relates to a method of triggering an event in a roving apparatus.

As used herein, the term "roving" is used to indicate that the apparatus may wander about without necessarily having a definite origin, route, or destination. It will be appreciated that such an apparatus does not require mapping means with route data.

This invention has particular but not exclusive application to the triggering of an audio and/or visual file in a roving hand-held unit.

The invention also has application in vehicles such as cars, planes, buses, and ferries.

BACKGROUND ART

European Patent Publication 410 137 to Bosch discloses the triggering of "specific information" when the current location of a vehicle corresponds to a triggering point within a street map, ie. "point triggering".

A system using Global Positioning Satellites (GPS) is disclosed in European Patent Publication 511 447 to Pioneer. In this system the position of an automobile is calculated by GPS and, when the automobile enters a pre-determined area, an audio-visual event relating to the area is triggered (see FIG 1), ie. "area triggering".

Another prior art system is known from European Patent Publication 672 890 to Aisin. Aisin discloses a method of capturing Points of Interest (POIs) using a metaphorical "torch beam". The torch may be selectively switched between "high" and "low" beam and all POIs which fall within the beam are captured and played (see FIG 2) in order of priority, ie. "beam triggering".

These known methodologies are too rudimentary to be

PCT/AU 96/00712

RECEIVED 23 DEC 1997

functional in an environment where there may be multiple POIs in close proximity, where the apparatus roves in a non-fixed route manner, or where GPS data wanders, for example.

DISCLOSURE OF THE INVENTION

In one aspect the invention resides in a method of triggering an event in a roving apparatus, the method including:-

associating one or more events with a locality;

specifying at least one triggering prerequisite for each event;

triggering an event if (a) the roving apparatus is within a predetermined proximity of the locality, and (b) the at least one triggering prerequisite specified for the event is met.

The triggering prerequisite may be, for example, direction of travel of the roving apparatus, position of the roving apparatus relative to the locality, increase in distance from the locality, time, day, date, temperature, password, or any other criteria.

In another aspect this invention resides in a method of triggering the playing of an audio and/or visual file in a roving apparatus, the method including:-

associating a plurality of audio and/or visual files with a locality;

specifying at least one triggering prerequisite for each audio and/or visual file;

triggering an audio and/or visual file if (a) the roving apparatus is within a predetermined proximity of the locality, and (b) the at least one triggering prerequisite specified for the event is met,

and wherein the content of the audio and/or visual file is a reflection of the prerequisite specified for the audio and/or visual file.

BRIEF DESCRIPTION OF THE FIGURES

In order that this invention may be more easily understood and put into practical effect, reference will now be made to the accompanying FIGS in which:-

FIG 1 is a schematic view of Pioneer's prior art methodology;

FIG 2 is a schematic view of Aisin's prior art methodology;

FIG 3 is a schematic view of triggering according to the present invention in which the triggering prerequisite is an increase in distance from the POI;

FIG 4 is a schematic view of triggering according to the present invention in which the triggering prerequisite is an increase in distance from the POI or a correspondence with a second smaller area;

FIG 5 is a schematic view of triggering according to the present invention in which the triggering prerequisite is direction of travel (and an increase in distance or a correspondence with a second smaller area);

FIG 6 is a schematic view of triggering according to the present invention in which the triggering prerequisite is an increase in distance from POI, however, the tolerable increase in distance is proportional to the distance from the POI;

FIG 7 is a schematic view of triggering according to the present invention in which the triggering prerequisite is relative position of the roving apparatus, and different files exist for each portion or zone.

BEST MODE

Referring now to FIG 3 there is illustrated an example of triggering according to the present invention. In this case the event is triggered when the calculated distance from the POI increases after the roving

PCT/AU 96/00712
RECEIVED 23 DEC 1997

apparatus has entered the predetermined proximity to the locality. This type of triggering is particularly useful in situations where fixed routes cannot be followed. For example, if the apparatus is installed in a ferry and circumstances dictate that the ferry must turn away from the POI before reaching the POI then the event will be triggered immediately after the point of closest approach to the POI.

Referring now to FIG 4 there is illustrated an example of a triggering system having two proximities relating to a locality, with the second proximity being within the first proximity. In this case the event is triggered if the calculated distance from the POI increases whilst within the main area or if the apparatus enters the inner smaller area.

In another embodiment the event is triggered when the apparatus departs the locality. This may be utilised for example when a ferry leaves its wharf and the exact wharf from which it leaves and the direction in which it leaves from the wharf is variable.

Referring to FIG 5, direction of travel can be used as the further criteria. In this regard the event will only be triggered if the apparatus is travelling in a predetermined direction or range of directions. This is particularly useful for alleviating false triggers in non-fixed route applications where a user may pass a point of interest in multiple directions whilst roving. Direction of travel is also particularly useful for adding relative position statements on the commentary, such as "On your left you will see...." or "On your right you will see...". The statement can be further customised by specifying what relative aspect is being viewed, eg. "...you will see the Northern side of ...."

Referring to FIG 6, there is illustrated a system in which a so-called "step ratio" is applied. In this system the event is not triggered immediately when the calculated distance increases, as this increase may be due to GPS positional data wandering or due to the

wandering of the apparatus itself. Accordingly the system hesitates before triggering the event. The event only triggers when the distance from the point of interest increases by an amount in excess of a tolerance amount. This tolerance amount is proportional to the calculated distance from the POI, ie. the tolerance is smaller when the calculated distance is smaller.

In FIG 7 there is illustrated an example of relative position triggering. In this particular case the approaches to the POI are divided into four 90 degree portions although any number of variable size portions could be used. Accordingly, if a pedestrian approaches from the north and the feature to be discussed is located to the west of the POI, then they would receive a message "On your right you will see...", if they approached from the south they would hear "On your left you will see....", and if they approached from the east they would hear "Directly ahead of you ....".

Alternatively, if the feature is coincident with the point of interest, then a pedestrian who approaches from the north would receive a message "You can now see the front entrance of building X", if they approach from the south they would hear "You can now see the rear entrance of building X".

In the preferred embodiment of the present invention the apparatus includes a mobile audio/visual system which is portable. In a portable apparatus a tourist could for instance arrive at Pom Peii and meander about the ruins whilst automatically receiving information about relevant points of interest. The tourist need not travel in any fixed route, nor activate the information manually.

Alternatively, the system can be installed in a ferry, bus or train to provide information regarding, for example, points of interest, location of next stop, time of arrival etc. The system can also be used to send location, average speed etc data back to a central base. The invention therefore also provides an effective fleet management tool.

The ferry, bus or train usually follows an established route. At certain points along the route it is desirable that audio/visual announcements be made, eg "On your right you will see...", or "This train is now arriving at Central" etc. The system ensures that such announcements are automatically made at the correct location without making any demands on the driver. The driver would, of course, be able to override the system or add further comments as necessary. The system may include a countdown timer or distance measurement which indicates to the driver when the next location triggered announcement will be made. Accordingly, the driver can add his or her comments without interrupting the next location triggered announcement.

Desirably, each file includes the relevant announcement followed by continuous filler music. When the subsequent location is reached the filler music is automatically faded and the next announcement made.

In some situations it is desirable to "wait then play". For example, it may be desirable that a particular file be played at a location where there is no GPS reception, eg. in a tunnel. In this circumstance the file may be triggered as the vehicle enters the tunnel, however there may be a 30 second delay between triggering and playing.

It is also preferable that the system flag any files which have been played so that they might be played once during a single session. The flags may be reset dependent on a predetermined increased distance from the locality, a predetermined elapse of time from trigger, or a predetermined location that resets all flags.

Each individual on a ferry, bus, train or plane may have a personal audio/visual system and the audio/visual files may be in a number of languages. A person on a tour may select their preferred language. Similarly, the files may also be in a number of personalities or have different presenters to suit different tastes.

The system could also be used to ensure that

entertainment such as movies are played at the correct location en-route.

The system includes a clock or sources time and date information from the satellite such that time specific announcements can be made, eg 15 minutes out of Canberra the announcement might be "We will be arriving in Canberra at (present time plus 15 minutes)". Similarly, the system may include other date, time, day, weather specific information. For example, an announcement may be "Good Morning (time), and welcome to Canberra on the chilly (weather) winter's (date) day". Equally, certain files relating to tourist attractions which are closed on certain days can be suppressed on those days. The system may also include velocity specific announcements, eg. "You are travelling at 90km/hı and you are reminded that the speed limit at this location is 80km/hr".

The files may be stored in any suitable medium and may be periodically updated, for example by RF link. Thus, files including news or current affairs can be regularly updated and other program material can be updated as required.

As mentioned previously the system can be used as a fleet management tool. For example, specified locations having good mobile phone reception may be selected at which a bus or truck in transit may report via modem back to base with information such as position, average velocity, fuel consumption, etc. This avoids the need for the base to poll the vehicle which may be out of communication at the time that it is polled.

It will be understood that the methodology of the present invention provides a level of sophistication not present in the prior art. The methodology of the present invention involves a decision making process over and above the generic locality prerequisite, ie. other parameters are considered before triggering. This effectively adds a level of qualification to the triggering of an event.

It will of course be realised that whilst the above

RECEIVED 23 DEC 1997

has been given by way of an illustrative example of this invention, all such and other modifications and variations hereto, as would be apparent to persons skilled in the art, are deemed to fall within the broad scope and ambit of this invention as is herein set forth.

PCT/AU 96/00712
RECEIVED 23 DEC 1997

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A method of triggering an event in a roving apparatus, the event relating to a predetermined area, the method including:-

calculating the position of the apparatus; and

triggering the event if (a) the calculated position falls within the predetermined area, and (b) at least one other criteria is satisfied.

2. A method as claimed in claim 1, wherein the other criteria is satisfied when there is an increase in distance from a predetermined point within the predetermined area.

3. A method as claimed in claim 1, wherein the other criteria is satisfied when the apparatus is travelling in a predetermined direction or range of directions.

4. A method as claimed in claim 1, wherein the other criteria is satisfied when the calculated position of the apparatus falls within a smaller area within the predetermined area.

5. A method as claimed in claim 1, wherein the other criteria is satisfied when the bearing of the apparatus relative to a predetermined point within the predetermined area falls within a predetermined range of bearings.

6. A method of triggering an event in a roving apparatus, the method including:-

associating one or more events with a locality;

specifying at least one triggering prerequisite for each event;

triggering an event if (a) the roving apparatus is within a predetermined proximity of the locality, and (b)

the at least one triggering prerequisite specified for the event is met.

7. A method of triggering an event as defined in claim 6, wherein the triggering prerequisite is direction of travel of the apparatus.

8. A method of triggering an event as defined in claim 6, wherein the triggering prerequisite is the bearing of the apparatus relative to the locality.

9. A method of triggering an event as defined in claim 6, wherein the triggering prerequisite is an increase in distance from the locality.

10. A method of triggering the playing of an audio and/or visual file in a roving apparatus, the method including:-

associating a plurality of audio and/or visual files with a locality;

specifying at least one triggering prerequisite for each audio and/or visual file;

triggering an audio and/or visual file if (a) the roving apparatus is within a predetermined proximity of the locality, and (b) the at least one triggering prerequisite specified for the event is met,

and wherein the content of the audio and/or visual file is a reflection of the prerequisite specified for the audio and/or visual file.

11. A method of triggering an event as defined in claim 10, wherein the triggering prerequisite is direction of travel of the apparatus.

12. A method of triggering an event as defined in claim 10, wherein the triggering prerequisite is the bearing of the apparatus relative to the locality.

RECEIVED 23 DEC 1997

13. A method of triggering an event as defined in claim 10, wherein the triggering prerequisite is an increase in distance from the locality.

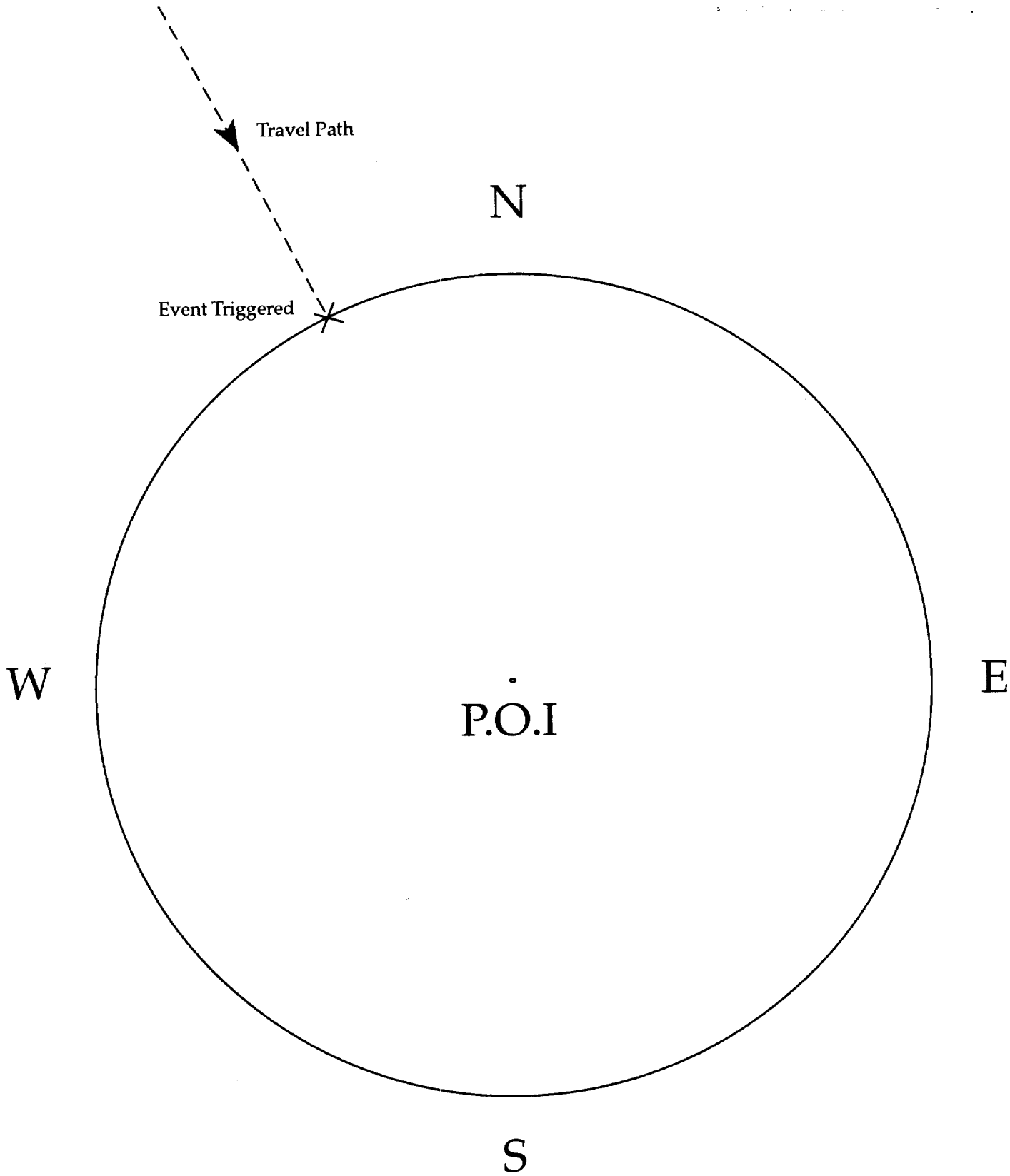


Fig. 1 (Prior Art - Pioneer)

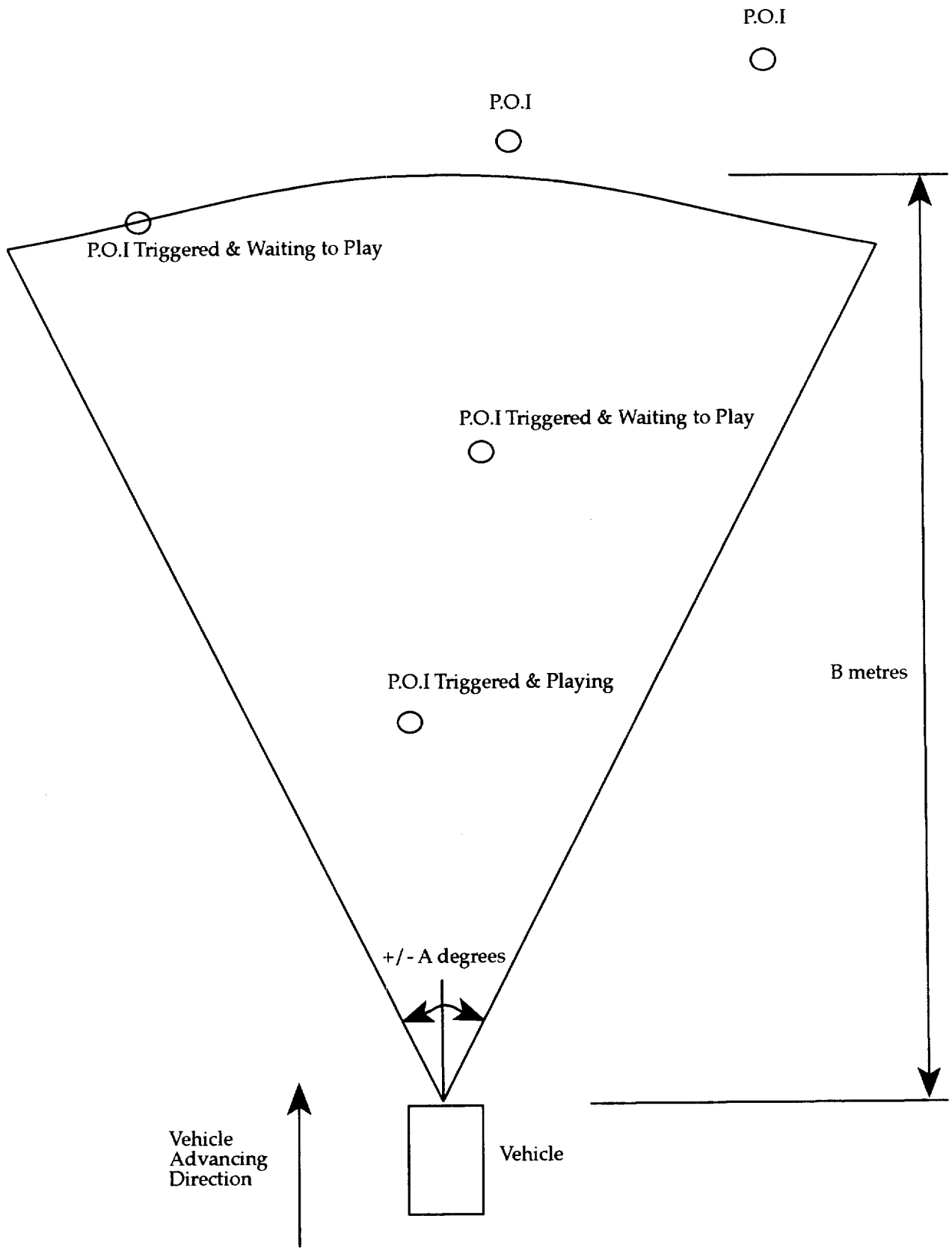


Fig. 2 (Prior Art - Aisin)

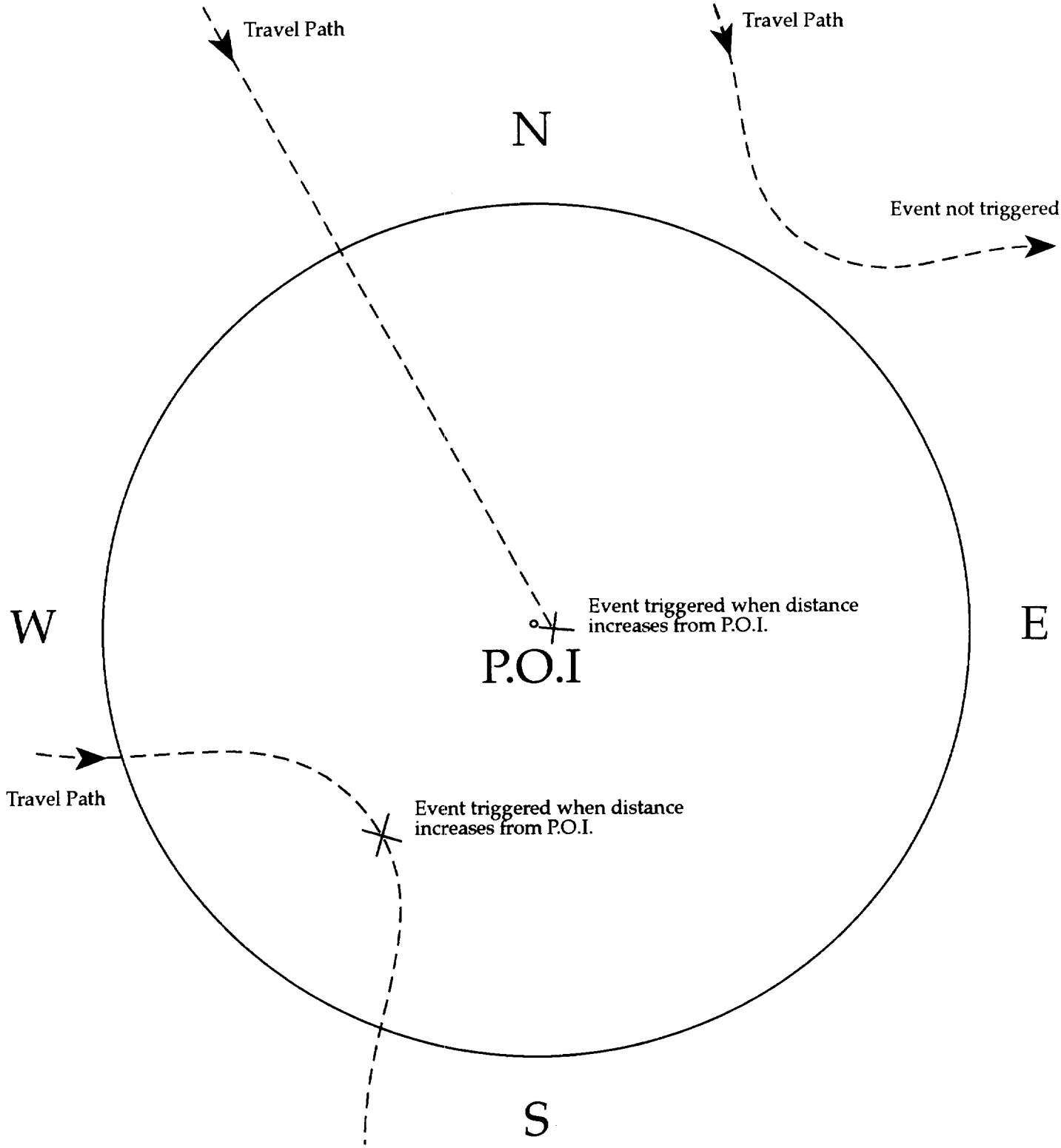


Fig. 3

RECEIVED

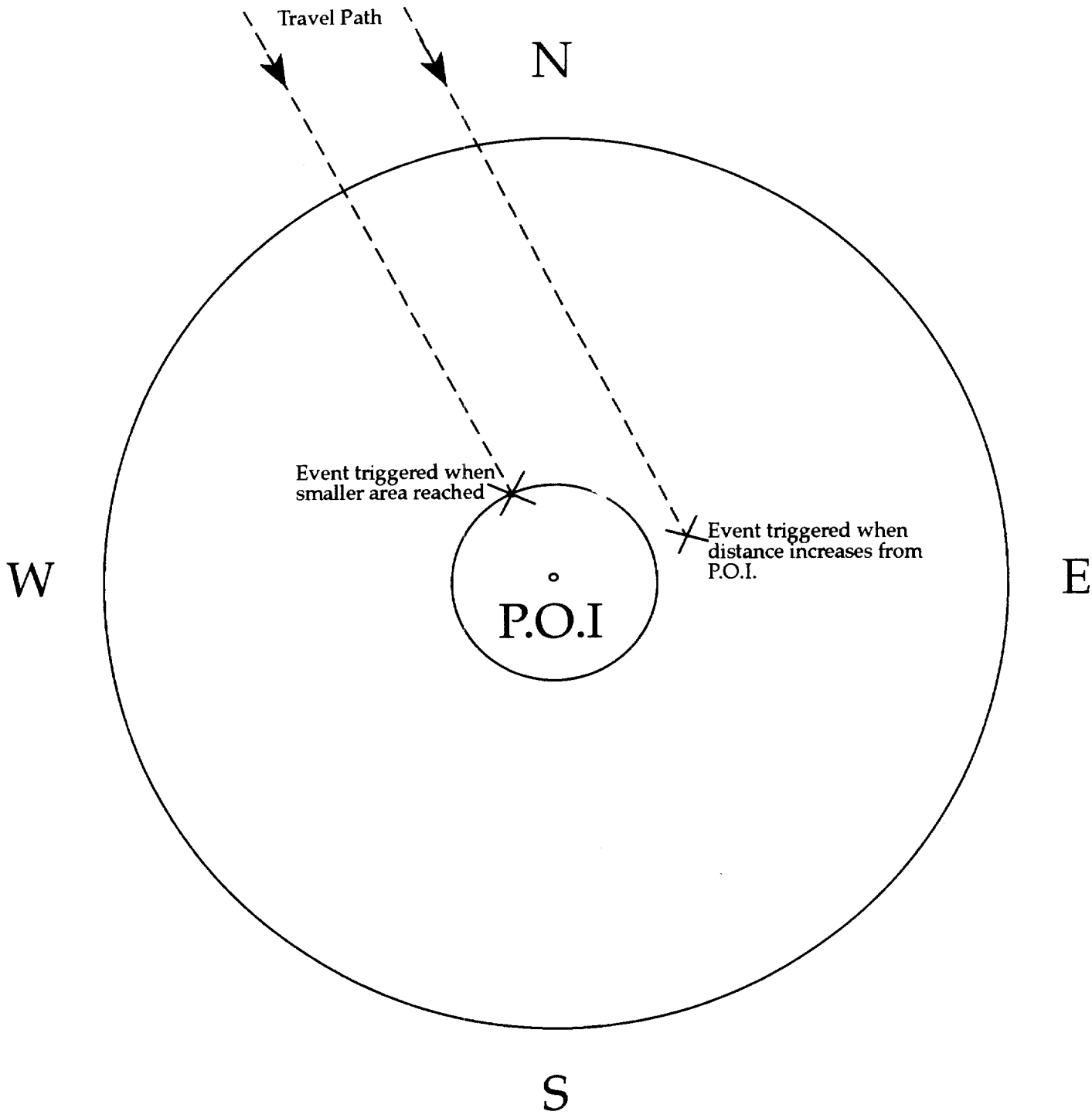


Fig. 4

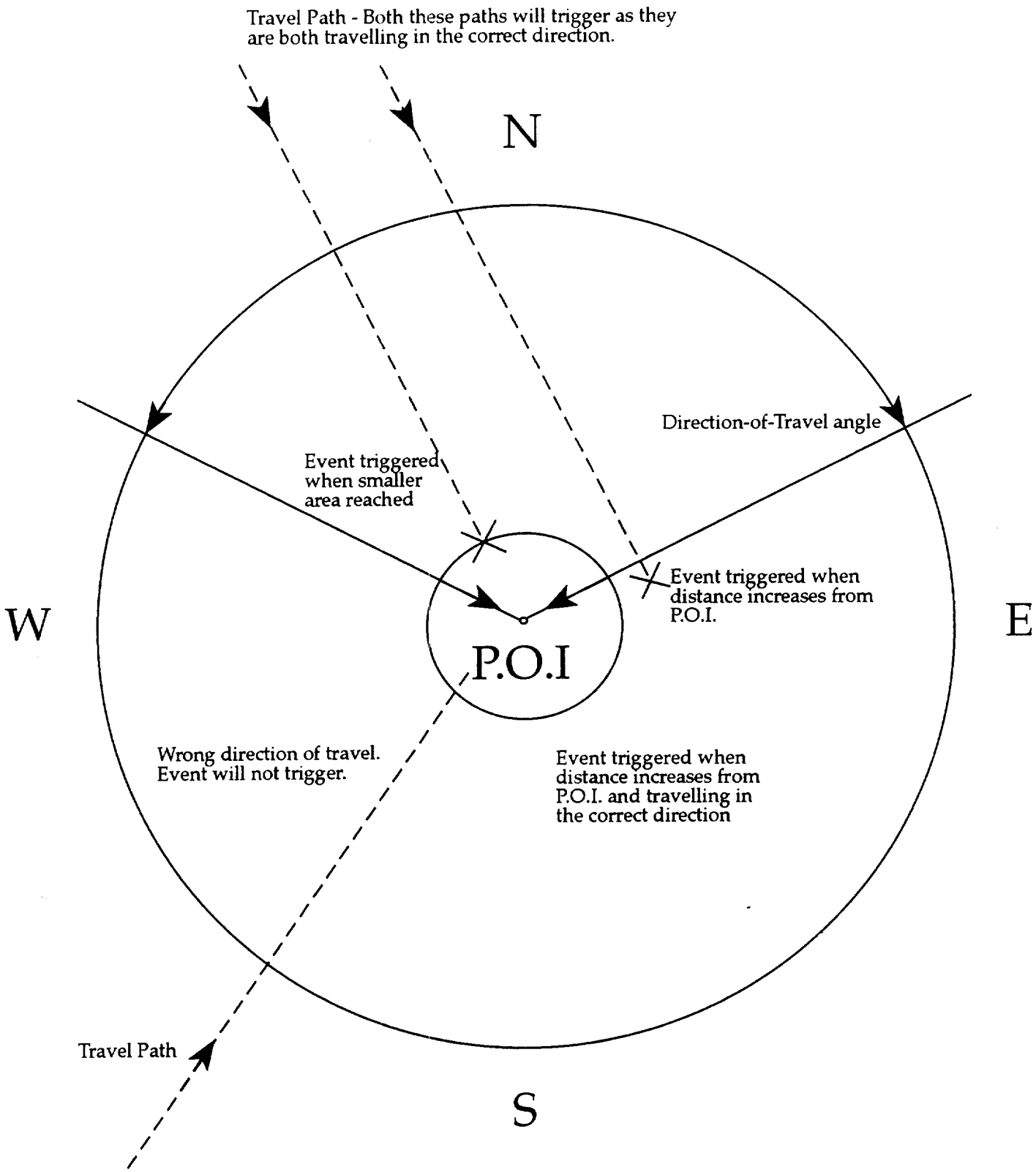

Travel Path - Both these paths will trigger as they are both travelling in the correct direction.
N
W
E
S
Direction-of-Travel angle
Event triggered when smaller area reached
Event triggered when distance increases from P.O.I.
P.O.I
Wrong direction of travel. Event will not trigger.
Event triggered when distance increases from P.O.I. and travelling in the correct direction
Travel Path

Fig. 5

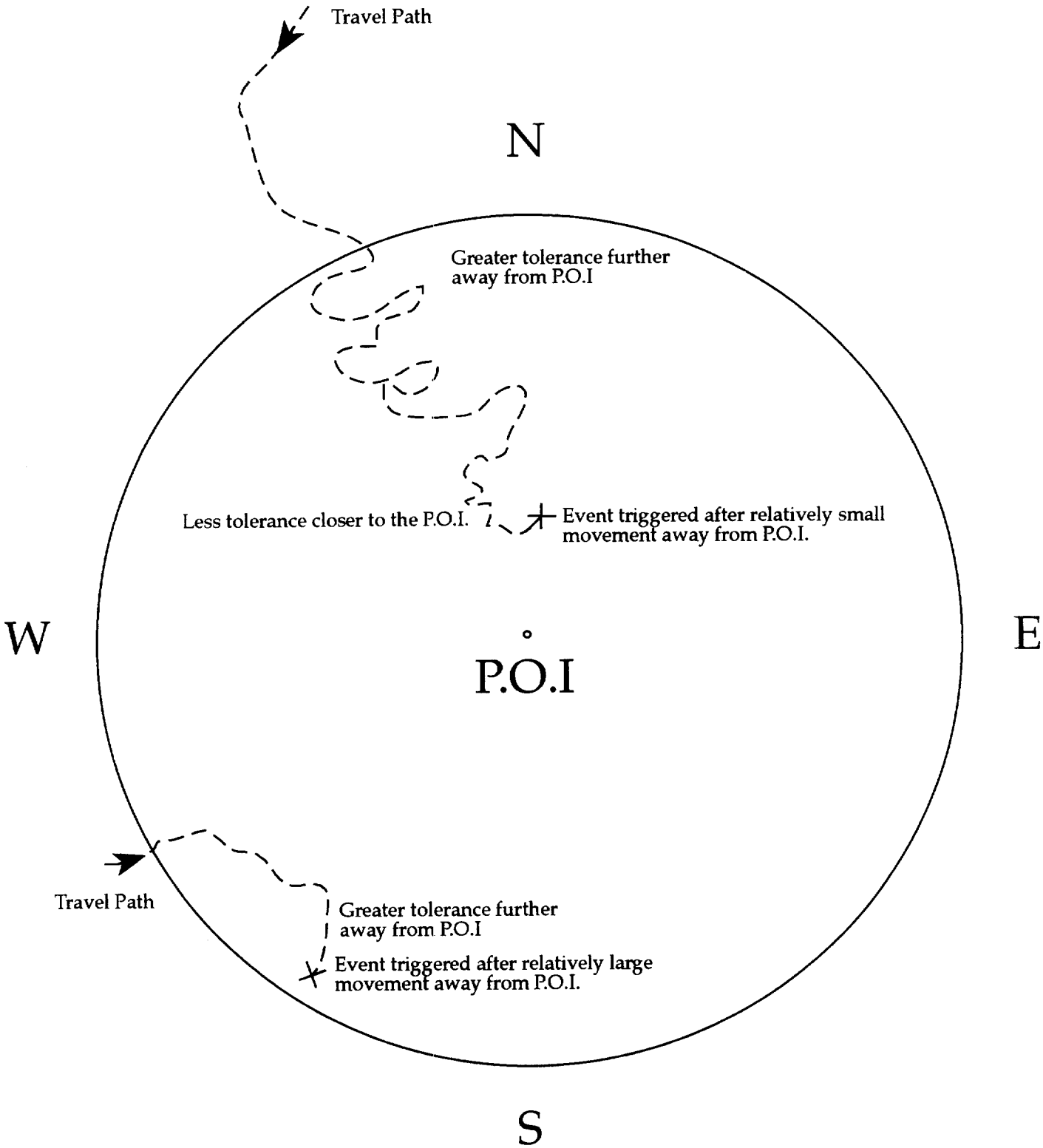

Travel Path
N
Greater tolerance further away from P.O.I
Less tolerance closer to the P.O.I.
Event triggered after relatively small movement away from P.O.I.
W
E
P.O.I
Travel Path
Greater tolerance further away from P.O.I
Event triggered after relatively large movement away from P.O.I.
S

Fig. 6

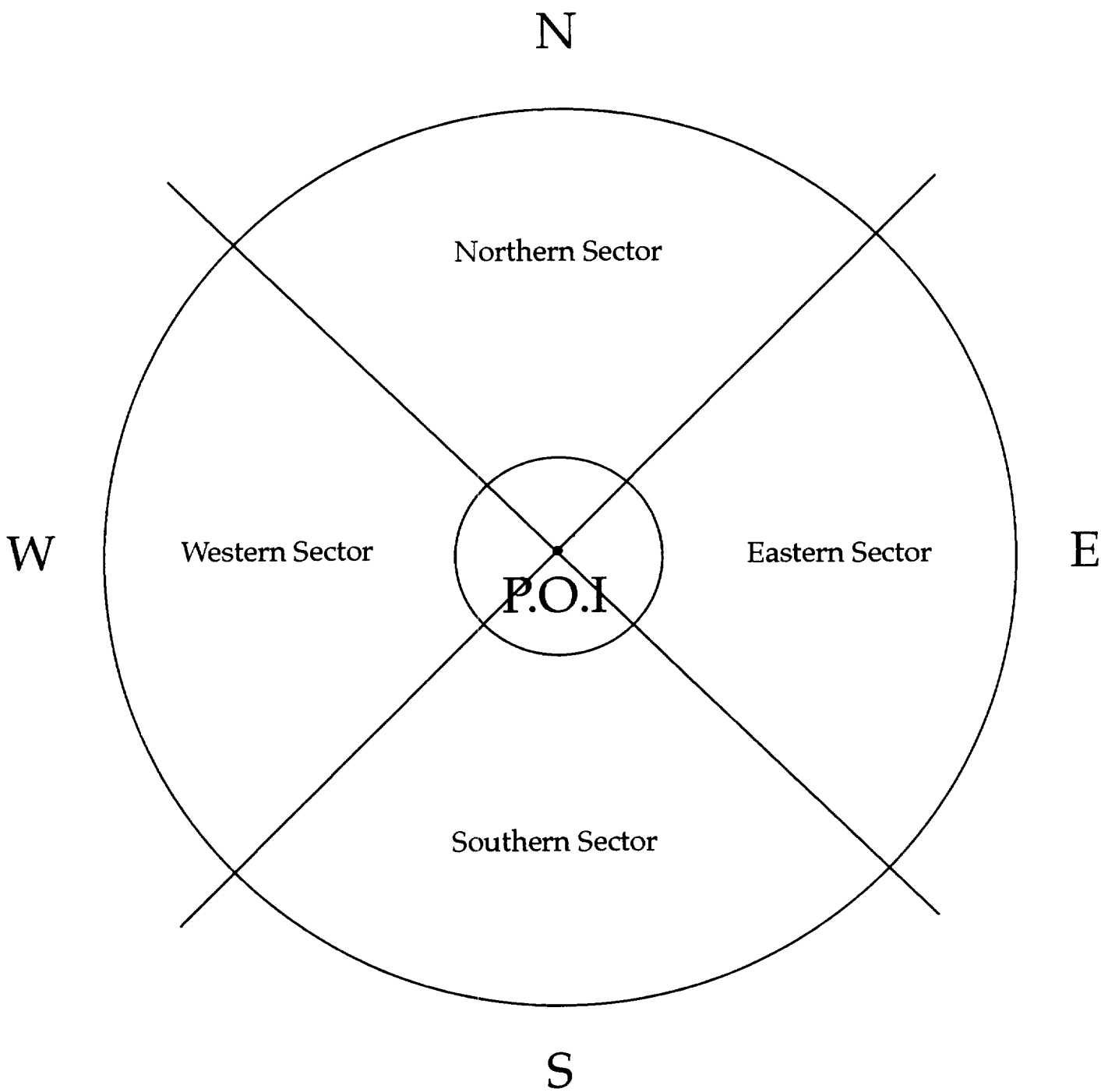
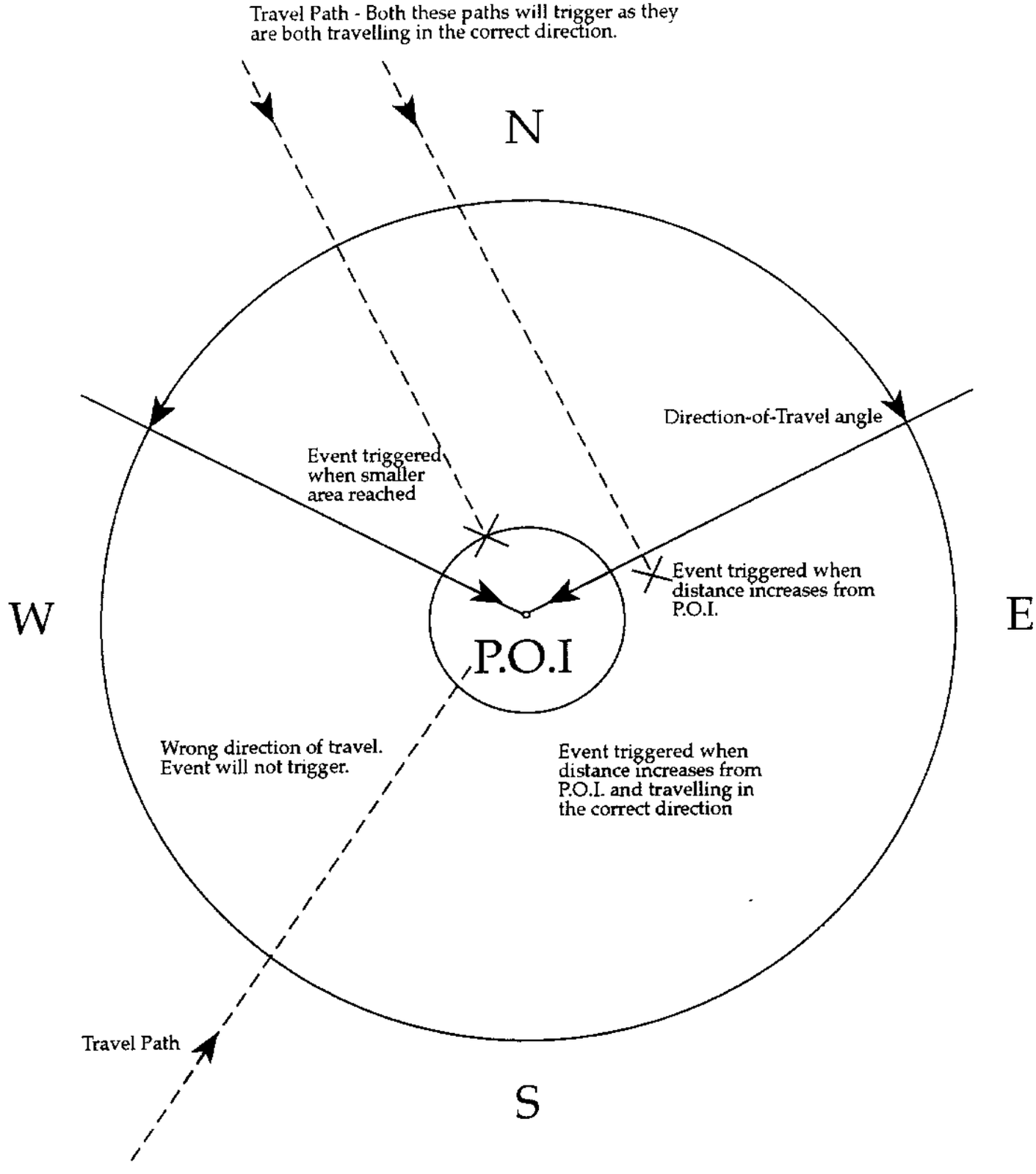

N
Northern Sector
W
Western Sector
P.O.I
Eastern Sector
E
Southern Sector
S

Fig. 7


Travel Path - Both these paths will trigger as they are both travelling in the correct direction.
N
W
E
S
P.O.I
Direction-of-Travel angle
Event triggered when smaller area reached
Event triggered when distance increases from P.O.I.
Wrong direction of travel. Event will not trigger.
Event triggered when distance increases from P.O.I. and travelling in the correct direction
Travel Path