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(54) **Mobile station and method for allocating finger thereof in a CDMA communication system**

Mobilfunkgerät und Verfahren zur Zuweisung von fingern dafür in einem CDMA-Nachrichtenübertragungssystem

Station mobile et procédé d'attribution de dérivation correspondant dans un système de communication à AMRC

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(56) References cited:  
**EP-A- 0 924 868 EP-A- 0 966 110**  
**WO-A-97/40398 WO-A-99/57819**  
**US-A- 5 936 999**

- **WILDE A.: 'EXTENDED TRACKING RANGE DELAY-LOCKED LOOP' COMMUNICATIONS - GATEWAY TO GLOBALIZATION. PROCEEDINGS OF THE CONFERENCE ON COMMUNICATIONS. SEATTLE, JUNE 18 - 22, 1995, PROCEEDINGS OF THE CONFERENCE ON COMMUNICATIONS 18 June 1995, NEW YORK, US, pages 1051 - 1053, XP000533156**

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**EP 1 198 074 B9**

## Description

### FIELD OF THE INVENTION

**[0001]** The present invention relates to a mobile station and a method for allocating a finger thereof in CDMA communication system.

### BACKGROUND OF THE INVENTION

**[0002]** In recent years, attention has been given to CDMA communication system that is potent against interference and jamming as a communication system used for mobile communication system.

**[0003]** CDMA communication system is the one wherein user signals, which are desired to transmit, are spread with spreading codes to transmit the user signals on a transmitting side, while inverse spreading is made by the use of the same spreading codes as that described above on its receiving side thereby to acquire the original user signals.

**[0004]** Furthermore, in CDMA communication system, multipath components due to phasing and the like are synthesized, whereby reliability in data is improved.

**[0005]** In the following, a constitution of a mobile station in CDMA communication system will be described.

**[0006]** Data is transmitted from a base station to a mobile station. In this occasion, however, there is a case where a plurality of paths exists depending upon an environment of the mobile station. For instance, where there are obstacles such as buildings, trees and the like in an environment of the mobile station, radio waves are reflected by these obstacles to present the plurality of paths,

**[0007]** FIG.1 shows an example of a constitution of a mobile station in a conventional CDMA communication system wherein three paths (radio waves A, B, and C) reside in between a base station 20 and the mobile station 30.

**[0008]** As shown in FIG.1, the mobile station 30 in the present constitutional example is composed of an antenna 1, an RF section 2, an AD section 3, a delay profile section 4, a finger allocating section 8, a plurality of finger sections 9, and a rake synthesizing section 7.

**[0009]** The antenna 1 receives a synthesized wave composed of a plurality of radio waves (radio waves A, B, and C) being arrived from the base station 20 through the plurality of paths. The RF section 2 converts the synthesized wave received by the antenna 1 into analog base band signals. The AD section 3 converts the analog base band signals converted in the RF section 2 into digital base band signals.

**[0010]** The delay profile section 4 acquires data transmitted from the base station 20 by spreading inversely with the use of the digital base band signals converted in the AD section 3. In this case, a delay profile is prepared by adding cumulatively the data acquired in a certain time interval for retrieving multipath components. In the case

where multipath components exist, a plurality of peaks of the radio waves (radio waves A, B, and C) can be detected in a delay profile as shown in FIG.2.

**[0011]** The finger allocating section 8 allocates path timings (reference timings) corresponding to positions of the respective peaks in the plurality of the radio waves detected in the delay profile section 4 to a separate finger sections 9, respectively.

**[0012]** Each of the finger sections 9 spreads inversely the digital base band signals converted by the AD section 3 at the respective path timings allocated by the finger allocating section 8, whereby data transmitted from the base station 20 is regenerated. The rake synthesizing section 7 synthesizes the data regenerated in the respective finger sections 9 to output demodulated data.

**[0013]** In the following, operation for path detection in the delay profile section 4 will be described.

**[0014]** The delay profile section 4 adds cumulatively data transmitted from the base station 20 for a certain period of time to prepare a delay profile. Such cumulative addition is implemented for the sake of discriminating a plurality of peaks in radio waves from noises, and in this respect, the longer period of time for cumulative addition can improve the better reliability in peak points.

**[0015]** However, too long period of time for cumulative addition brings about a possibility of displacement in peak points due to out of alignment in reference timing in between the base station 20 and the mobile station 30, influence of clock jitter inside the mobile station 30 or the like as shown in FIG.3.

**[0016]** Accordingly, each of the finger sections 9 tracks a path at a shorter cycle than a period of time for cumulative addition in the delay profile section 4 in order to follow positional changes (displacement) in peak points of the path.

**[0017]** In the following, path tracking operation in each of the finger sections 9 will be described by referring to FIG.4.

**[0018]** FIG.4 is a block diagram showing an example of a constitution of each of the finger sections 9 shown in FIG.6.

**[0019]** As shown in FIG.4, the finger section 9 in the present constitutional example is composed of an inversely spreading section 11, an electric power computational section 12, a maximum value detecting section 13, and a selector section 14.

**[0020]** The inversely spreading section 11 converts digital base band signals converted by the AD section 3 into data. Furthermore, the inversely spreading section 11 performs inverse spreading within a predetermined segment positioned between before and after segments of a path timing allocated by the finger allocating section 8 (hereinafter referred to as "path tracking range"). For instance, when inverse spreading is performed within path tracking ranges defined among five sections extending over before and after path timing, the inversely spreading section 11 outputs symbol data reside among the five sections, i.e., five symbol data.

**[0021]** The electric computational section 12 computes each of electric power values of the five symbol data output from the inversely spreading section 11. The maximum value detecting section 13 detects the maximum value among five electric power values computed by the electric power computational section 12.

**[0022]** The selector section 14 selects only the symbol data having the maximum electric power value detected by the maximum value detecting section 13 among the five symbol data computed in the inversely spreading section 11 to output them.

**[0023]** As described above, inverse spreading is implemented within a predetermined path tracking range among segments positioned in between before and after the path timing instructed by the finger allocating section 8 thereby to acquire data, and the maximum electric power value is retrieved from the data, so that the finger section 9 follows delicate fluctuation.

**[0024]** In a conventional mobile station as mentioned above, however, when it is assumed that there are three radio waves being arrived from a base station to the mobile station (radio waves A, B, and C) and that each of path timings in the radio waves A, B, and C is allocated to each of separate finger sections in the case where distances of peak positions in the three radio waves are narrow, respectively, as shown in FIG.5, inverse spreading is implemented within a predetermined path tracking range defined among segments positioned in between before and after a path timing in each finger section. As a result, inverse spreading timings in all the finger sections overlap with the radio wave A residing at a point of the maximum electric power value, whereby a plurality of radio waves comes to be not received, so that there is a problem of deteriorating reception property in mobile station.

**[0025]** WO 97/40398 discloses a terrestrial C/A code GPS receiver system that digitally samples, filters and stores a segment of 11 half chips of the received composite as a binary number and multiplexes this number for parallel correlation with each of a series of multibit code replicas for the satellites to be tracked. Each of the time delay specific correlation products are accumulated in a cell of a memory matrix so that at least twenty-two delays for each satellite may be evaluated each code period providing fast reacquisition even within a city intersection, as well as correction of multipath tracking and multipath interference. All cells of the memory matrix may be used for an acquisition of a single satellite in about 4 ms. Two satellite tracking, in addition to altitude hold, uses cross-track hold alternating with clock hold to update the cross-track estimate. Single satellite tracking uses cross-track and clock hold together. Navigation data is updated with detected changes in motion including turns.

## SUMMARY OF THE INVENTION

**[0026]** Accordingly, the present invention has been

made in view of the problems involved in the prior art as mentioned above. An object of the present invention is to provide a mobile station and a method for allocating a finger thereof in CDMA communication system by which a plurality of radio waves is positively received in even a case where distances of peak positions in the plurality of radio waves being arrived from a base station to the mobile station are narrow, whereby deterioration in reception property can be prevented.

**[0027]** In order to achieve the above-described object, a mobile station in CDMA communication system according to the present invention wherein the mobile station is composed of a plurality of finger sections in each of which each of plural radio waves being arrived from a base station through a plurality of paths is inversely spread to regenerate data from the base station, and a finger allocating section for allocating a path timing corresponding to each peak position of the plurality of radio waves to each of the plurality of finger sections; each of the plurality of radio waves is inversely spread in a path tracking range among segments positioned before and after the path timing allocated by the finger allocating section comprises the path tracking range being variable in each of the plurality of finger sections.

**[0028]** Furthermore, a mobile station in CDMA communication system according to the present invention as described above is characterized in that the finger allocating section instructs the path tracking range with respect to each of the plurality of finger sections; and each of the plurality of finger sections makes variable the path tracking range on the basis of the instruction by the finger allocating section.

**[0029]** Moreover, a mobile station in CDMA communication system according to the present invention as described above is characterized in that the finger allocating section decides the path tracking range in each of the plurality of finger sections on the basis of each distance of peak positions in the plurality of radio waves.

**[0030]** Still further, a mobile station in CDMA communication system according to the present invention as described above is characterized in that the mobile station in CDMA communication system is composed of an antenna for receiving a plurality of radio waves being arrived from the base station through the plurality of paths; an RF section for converting the plurality of radio waves received by the antenna into analog base band signals; an A/D section for converting the analog base band signals converted by the RF section into digital base band signals, a delay profile section for inversely spreading the digital base band signals converted by the A/D section in every predetermined periods of time to detect the respective peaks of the plurality of radio waves; and a rake synthesizing section for synthesizing data regenerated in each of the plurality of finger sections; the finger allocating section allocates a path timing corresponding to each peak position of the plurality of radio waves detected by the delay profile section to each of the plurality of finger sections, and further decides the path tracking

range in each of the plurality of finger sections on the basis of each of distances of peak positions in the plurality of radio waves decocted by the delay profile section; besides, each of the plurality of finger sections spreads inversely the digital base band signals converted by the A/D section within a path tracking range decided by the finger allocating section among segments positioned before and after each of path timings allocated by the finger allocating section, whereby data from the base station is regenerated.

**[0031]** Yet further, a method for allocating a finger of a mobile station in CDMA communication system involving a plurality of finger sections for spreading inversely each of a plurality of radio waves being arrived from a base station through a plurality of paths to generate data from the base station according to the present invention comprises the steps of detecting each peak of the plurality of radio waves to allocate a path timing corresponding to each peak of the positions detected to each of the plurality of finger sections; and deciding a path tracking range in each of the plurality of finger sections; the plurality of radio waves being inversely spread within the path tracking range among segments positioned before and after the path timing in each of the plurality of finger sections.

**[0032]** Further, a method for allocating a finger according to the present invention as described above is characterized in that the path tracking range in each of the plurality of finger sections is decided on the basis of each distance of peak positions in the plurality of radio waves.

**[0033]** In the present invention constituted as described above, a finger allocating section allocates path timings corresponding to peak positions of a plurality of radio waves being arrived from a base station through a plurality of paths to a plurality of finger sections, respectively, and further decides a path tracking range in each of the plurality of the finger sections on the basis of respective distances of peak positions in the plurality of radio waves, while the plurality of radio waves are inversely spread within a path tracking range decided by the finger allocating section among segments positioned before and after a path timing allocated by the finger allocating section in each of the finger sections, whereby data transmitted from the base station is regenerated.

**[0034]** In these circumstances, for example, when a plurality of radio waves being arrived from the base station to a mobile station have distances of peak positions, which are narrow from one another, the finger allocating section narrows a path tracking range in each of the finger sections. Accordingly, it becomes possible to conduct inverse spreading within a path tracking range independent from other path tracking ranges in each of the finger sections.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0035]** The present invention will be explained in more detail in conjunction with appended drawings, wherein:

FIG.1 is a block diagram showing a constitutional example of a mobile station in a conventional CDMA communication system;

FIG.2 is a graphical representation illustrating an example of a delay profile prepared in a delay profile section shown in FIG.1;

FIG.3 is a graphical representation for explaining fluctuation in peak positions (path timings) of respective radio waves shown in FIG.2;

FIG.4 is a block diagram showing a constitutional example of the finger section shown in FIG.1;

FIG.5 is a graphical representation illustrating another example of a delay profile prepared in the delay profile section shown in FIG.1, and

FIG.6 is a block diagram showing an embodiment of a mobile station in CDMA communication system according to the present invention.

#### DESCRIPTION OF THE PREPERRED EMBODIMENTS

**[0036]** In the following, an embodiment of the present invention will be described in detail by referring to the accompanying drawings wherein FIG.6 is a block diagram showing an embodiment of a mobile station in CDMA communication system according to the present invention. In FIG.6, it is assumed that three paths (radio waves A, B, and C) reside in between a mobile station 10 and a base station 30. Like parts of a mobile station 30, which are shown in FIG.1, are designated by the same reference characters therein as those of FIG.6, and the description relating thereto will be omitted.

**[0037]** As shown in FIG.6, a finger allocating section 5 and a plurality of finger sections 6 are disposed in the mobile station 10 of the present embodiment in place of the finger allocating section 8 and the plurality of the finger sections 9 shown in FIG. 1, and the remaining constitution of the mobile station 30 in FIG.6 is the same as that of FIG.1.

**[0038]** The finger allocating section 5 allocates path timings corresponding to peak positions of a plurality of radio waves detected by a delay profile section 4 to separate finger sections 6, respectively, and further decides a path tracking range in each of the finger sections 6 on the basis of respective distances of peak positions in the plurality of radio waves.

**[0039]** In each of the finger sections 6, a path tracking range is variable. Digital base band signals converted by an AD section 3 are inversely spread within a path tracking range decided by the finger allocating section 5 among segments positioned before and after a path timing allocated by the finger allocating section 5, whereby data transmitted from the base station 20 is regenerated.

**[0040]** In the following, a method for allocating a finger of a mobile station in CDMA communication system constituted as described above will be described.

**[0041]** For instance, when three radio waves (radio waves A, B, and C) being arrived from the base station

20 to the mobile station 10 reside and distances of peak positions of the three radio waves are distant from one another as shown in FIG.2, the finger allocating section 5 broadens a path tracking range in each of the finger sections 6 (into, e.g., a five-point segment), while the finger allocating section 5 narrows a path tracking range in each of the finger sections 6 (into, e.g., a three-point segment) in the case where distances of peak positions of the three radio waves are narrow from one another as shown in FIG.5.

[0042] Thus, it becomes possible to conduct inverse spreading within a path tracking range independent from other path tracking ranges in each of the finger sections 6. Accordingly, it becomes possible to receive positively all the radio waves.

[0043] As described above, the present invention is constituted in such that a finger allocating section allocates path timings corresponding to peak positions of a plurality of radio waves being arrived from a base station through a plurality of paths to a plurality of finger sections, respectively, and further decides a path tracking range in each of the plurality of the finger sections on the basis of respective distances of peak positions in the plurality of radio waves, while the plurality of radio waves are inversely spread within a path tracking range decided by the finger allocating section among segments positioned before and after a path timing allocated by the finger allocating section in each of the finger sections, whereby data transmitted from the base station is regenerated.

[0044] In these circumstances, for example, when a plurality of radio waves being arrived from the base station so a mobile station have distances of peak positions, which are distant from one another, the finger allocating section broadens a path tracking range in each of the finger sections, while the finger allocating section narrows a path tracking range in each of the finger sections. According to such arrangement as described above, inverse spreading can be conducted within a path tracking range independent from other path tracking ranges in each of the finger sections. Hence, it becomes possible to receive positively all the radio waves, whereby deterioration in reception property in the mobile station can be prevented.

[0045] Furthermore, even when peak positions in respective radio waves fluctuate due to a discrepancy in reference timing of a base station and a mobile station, influence of clock jitter inside the mobile station and the like, inverse spreading can be implemented within a path tracking range in response to fluctuations in the peak positions.

[0046] The presently disclosed embodiments are therefore considered in all respects to be illustrative and not restrictive. The scope of the invention is indicated by the appended claims rather than the foregoing description, and all changes that come within the meaning and range of equivalents thereof are intended to be embraced therein.

## Claims

1. A mobile station in CDMA communication system wherein the mobile station is composed of a plurality of finger sections (6) in each of which each of plural radio waves being arrived from a base station (20) through a plurality of paths is inversely spread to regenerate data from said base station (20), and a finger allocating section (5) for allocating a path timing corresponding to each peak position of said plurality of radio waves to each of said plurality of finger sections (6); each of said plurality of radio waves is inversely spread in a path tracking range within segments positioned before and after the path timing allocated by said finger allocating section (5) said mobile station being **characterized by** said path tracking range being variable in each of said plurality of finger sections, wherein:

said finger allocating section (5) instructs said path tracking range with respect to each of said plurality of finger sections (6), and each of said plurality of finger sections (6) makes variable said path tracking range on the basis of the instruction by said finger allocating section (5),

wherein:

said finger allocating section (5) decides said path tracking range in each of said plurality of finger sections (6) on the basis of each distance of peak positions in said plurality of radio waves.

2. A mobile station in CDMA communication system as claimed in claim 1, wherein:

said mobile station in CDMA communication system is composed of an antenna (1) for receiving a plurality of radio waves being arrived from said base station (20) through said plurality of paths;

an RF section (2) for converting the plurality of radio waves received by said antenna (1) into analog base band signals;

an A/D section (3) for converting the analog base band signals converted by said RF section (2) into digital base band signals;

a delay profile section (4) for inversely spreading the digital base band signals converted by said A/D section in every predetermined periods of time to detect the respective peaks of said plurality of radio waves; and

a rake synthesizing section (7) for synthesizing data regenerated in each of said plurality of finger sections

said finger allocating section (5) allocates a path

timing corresponding to each peak position of the plurality of radio waves detected by said delay profile section to each of said plurality of finger sections (6), and further decides said path tracking range in each of said plurality of finger sections (6) on the basis of each of distances of peak positions in the plurality of radio waves detected by said delay profile section; besides, each of said plurality of finger sections (6) spreads inversely the digital base band signals converted by said A/D section within a path tracking range decided by said finger allocating section (5) within segments positioned before and after each of path timings allocated by said finger allocating section (5), whereby data from said base station (20) is regenerated.

3. A method for allocating a finger of a mobile station in CDMA communication system involving a plurality of finger sections (6) for spreading inversely each of a plurality of radio waves being arrived from a base station (20) through a plurality of paths to generate data from said base station (20), comprising the steps of:

detecting each peak of said plurality of radio waves to allocate a path timing corresponding to each peak of the positions detected to each of said plurality of finger sections (6); and deciding a path tracking range in each of said plurality of finger sections (6), said method being **characterized by** said plurality of radio waves being inversely spread within said path tracking range within segments positioned before and after said path timing in each of said plurality of finger sections (6), said method further comprising: instructing said path tracking range with respect to each of said plurality of finger sections; and each of said plurality of finger sections (6) makes variable said path tracking range on the basis of said instruction.

wherein:

said path tracking range in each of said plurality of finger sections (6) is decided on the basis of each distance of peak positions in said plurality of radio waves.

## Patentansprüche

1. Eine Mobilstation in einem CDMA-Kommunikationssystem, wobei die Mobilstation zusammengesetzt ist aus einer Mehrzahl von Fingerabschnitten (6), in jedem von denen jede einer Mehrzahl von Radiowellen, die von einer Basisstation (20) durch eine Mehr-

zahl von Pfaden ankommt, invers gespreizt wird, um Daten von der Basisstation (20) wieder zu erzeugen, und einem Fingerzuweisungsabschnitt (5) zum Zuweisen eines Pfad-Timings, das jeder Spitzenposition der Mehrzahl von Radiowellen entspricht, zu jedem der Mehrzahl von Fingerabschnitten (6); wobei jede der Mehrzahl von Radiowellen invers gespreizt wird in einem Pfadverfolgungsbereich innerhalb von Segmenten, die vor und nach dem Pfad-Timing positioniert sind, das durch den Fingerzuweisungsabschnitt (5) zugewiesen wurde, wobei die Mobilstation **dadurch gekennzeichnet ist, dass** der Pfadverfolgungsbereich in jeder der Mehrzahl von Fingerabschnitten variabel ist, der Fingerzuweisungsabschnitt (5) den Pfadverfolgungsbereich instruiert bezüglich jeder der Mehrzahl von Fingerabschnitten (6); und jeder der Mehrzahl von Fingerabschnitten (6) den Pfadverfolgungsabschnitt variabel macht basierend auf der Instruktion durch den Fingerzuweisungsabschnitt (5), wobei:

der Fingerzuweisungsabschnitt (5) den Pfadverfolgungsbereich in jedem der Mehrzahl von Fingerabschnitten (6) auf der Basis von jeder Distanz von Peakpositionen in der Mehrzahl von Radiowellen entscheidet.

2. Eine Mobilstation in einem CDMA-Kommunikationssystem wie in Anspruch 1 beansprucht, wobei:

die Mobilstation in dem CDMA-Kommunikationssystem zusammengesetzt ist aus einer Antenne (1) zum Empfangen einer Mehrzahl von Radiowellen, die von der Basisstation (20) durch die Mehrzahl von Pfaden ankommen; einen RF-Abschnitt (2) zum Konvertieren der Mehrzahl von Radiowellen, die durch die Antenne (1) empfangen werden, in analoge Basisbandsignale; einen A/D-Abschnitt (3) zum Konvertieren der analogen Basisbandsignale, die durch den RF-Abschnitt (2) konvertiert wurden, in digitale Basisbandsignale; einen Verzögerungsprofilabschnitt (4) zum inversen Spreizen der digitalen Basisbandsignale, die durch den A/D-Abschnitt konvertiert wurden, in jeder vorbestimmten Zeitperiode, um die jeweiligen Spitzen der Mehrzahl von Radiowellen zu detektieren; und einen Rake-Synthetisierungsabschnitt (7) zum Synthetisieren von Daten, die in jeder der Mehrzahl von Fingerabschnitten wieder erzeugt wurden; wobei der Fingerzuweisungsabschnitt (5) ein Pfad-Timing, das jeder Spitzenposition der Mehrzahl von Radiowellen entspricht, die durch

den Verzögerungsprofilabschnitt detektiert wurden, zu jeder der Mehrzahl von Fingerabschnitten (6) zuweist, und ferner den Pfadverfolgungsbereich in jedem der Mehrzahl von Fingerabschnitten (6) auf der Basis von jeder von Abständen von Spitzenpositionen in der Mehrzahl von Radiowellen, die durch den Verzögerungsprofilabschnitt detektiert wurden, bestimmt, wobei daneben, jeder der Mehrzahl von Fingerabschnitten (6) die digitalen Basisbandsignale invers spreizt, die durch den A/D-Abschnitt innerhalb eines Pfadverfolgungsbereichs, der durch den Fingerzuweisungsabschnitt (5) entschieden wurde, innerhalb von Segmenten, die vor und nach jedem Pfadverfolgungstiming, das von dem Fingerzuweisungsabschnitt (5) zugewiesen wurde, konvertiert, wobei Daten von der Basisstation (20) wieder erzeugt werden.

3. Ein Verfahren zum Zuweisen eines Fingers einer Mobilstation in einem CDMA-Kommunikationssystem, das eine Mehrzahl von Fingerabschnitten (6) einschließt, zum inversen Spreizen von jedem einer Mehrzahl von Radiowellen, die von einer Basisstation (20) durch eine Mehrzahl von Pfaden ankommen, um Daten von der Basisstation (20) zu erzeugen, aufweisend die Schritte:

Detektieren von jeder Spitze der Mehrzahl von Radiowellen, um ein Pfad-Timing zuzuweisen, das jeder Spitze der Positionen entspricht, die detektiert wurden, zu jedem der Mehrzahl von Fingerabschnitten (6); und

Entscheiden eines Pfadverfolgungsbereichs in jedem der Mehrzahl von Fingerabschnitten (6); wobei das Verfahren **gekennzeichnet ist dadurch**, dass

die Mehrzahl von Radiowellen invers gespreizt werden innerhalb des Pfadverfolgungsbereichs innerhalb von Segmenten, die vor und nach dem Pfad-Timing in jedem der Mehrzahl von Fingerabschnitten (6) positioniert sind, wobei das Verfahren ferner aufweist:

Instruieren des Pfadverfolgungsbereichs bezüglich jedem der Mehrzahl von Fingerabschnitten; und

jeder der Mehrzahl von Fingerabschnitten (6) den Pfadverfolgungsbereich auf der Basis der Instruktion variabel macht, wobei:

der Pfadverfolgungsbereich in jeder der Mehrzahl von Fingerabschnitten (6) entschieden wird auf der Basis von jeder Distanz von Spitzenpositionen in der Mehrzahl von Radiowellen.

## Revendications

1. Station mobile dans un système de communication CDMA, dans laquelle la station mobile est composée d'une pluralité de sections de doigt (6) dans chacune desquelles chacune d'une pluralité d'ondes radioélectriques arrivant d'une station de base (20) par l'intermédiaire d'une pluralité de trajectoires est inversement propagée pour régénérer des données provenant de ladite station de base (20), et une section d'affectation de doigt (5) permettant d'affecter une chronologie de trajectoire correspondant à chaque position pic de ladite pluralité d'ondes radioélectriques à chacune de la pluralité de sections de doigt (6) ; chacune de ladite pluralité d'ondes radioélectriques est inversement propagée dans une portée de relevé de trajectoire au sein de segments positionnés avant et après la chronologie de trajectoire affectée par ladite section d'affectation de doigt (5), ladite station mobile étant **caractérisée en ce que** ladite portée de relevé de trajectoire est variable dans chacune de ladite pluralité de sections de doigt, ladite section d'affectation de doigt (5) informe chacune de ladite pluralité de sections de doigt (6) à propos de la portée de relevé de trajectoire ; et chacune de ladite pluralité de sections de doigt (6) rend ladite portée de relevé de trajectoire variable d'après l'instruction par ladite section d'affectation de doigt (5), dans laquelle :

ladite section d'affectation de doigt (5) décide de ladite portée de relevé de trajectoire dans chacune de ladite pluralité de sections de doigt (6) d'après chaque distance de positions pics dans ladite pluralité d'ondes radioélectriques.

2. Station mobile dans un système de communication CDMA selon la revendication 1, dans laquelle :

ladite station mobile dans le système de communication CDMA est composée d'une antenne (1) permettant de recevoir une pluralité d'ondes radioélectriques arrivant depuis ladite base (20) par l'intermédiaire de ladite pluralité de trajectoires ;  
une section RF (2) permettant de convertir la pluralité d'ondes radio reçues par ladite antenne (1) en signaux de bande de base analogiques ;  
une section A/N (3) pour convertir les signaux de bande de base analogiques convertis par ladite section RF (2) en signaux de bande de base numériques ;  
une section de profil de retard (4) pour propager inversement les signaux de bande de base numériques convertis par ladite section A/N dans chaque période prédéterminée pour détecter les pics respectifs de ladite pluralité d'ondes

radioélectriques ; et

une section de synthèse de pente (7) permettant de synthétiser des données régénérées dans chacune de ladite pluralité de sections de doigt ;  
 ladite section d'affectation de doigt (5) affecte 5  
 une chronologie de trajectoire correspondant à chaque position pic de la pluralité d'ondes radioélectriques détectées par ladite section de profil de retard à chacune de ladite pluralité de sections de doigt (6), et décide en outre de ladite portée de relevé de trajectoire dans chacune de ladite pluralité de sections de doigt (6) d'après chacune des distances de positions pics dans la pluralité d'ondes radioélectriques détectées par ladite section de profil de retard ; 10  
 en outre, chacune de ladite pluralité de sections de doigt (6) propage inversement les signaux de bande de base numériques convertis par ladite section AIT dans une portée de relevé de trajectoire décidée par ladite section d'affectation de doigt (5) au sein de segments positionnés avant et après chacune des chronologies de trajectoire affectées par ladite section d'affectation de doigt (5) ; moyennant quoi des données provenant de ladite station de base (20) 15  
 sont régénérées. 20  
 25

3. Procédé permettant d'affecter un doigt d'une station mobile dans un système de communication CDMA impliquant une pluralité de sections de doigt (6) pour propager inversement chacune d'une pluralité d'ondes radioélectriques arrivant d'une station de base (20) par l'intermédiaire d'une pluralité de trajectoires pour générer des données provenant de ladite station de base (20), comprenant les étapes consistant à : 30  
 35

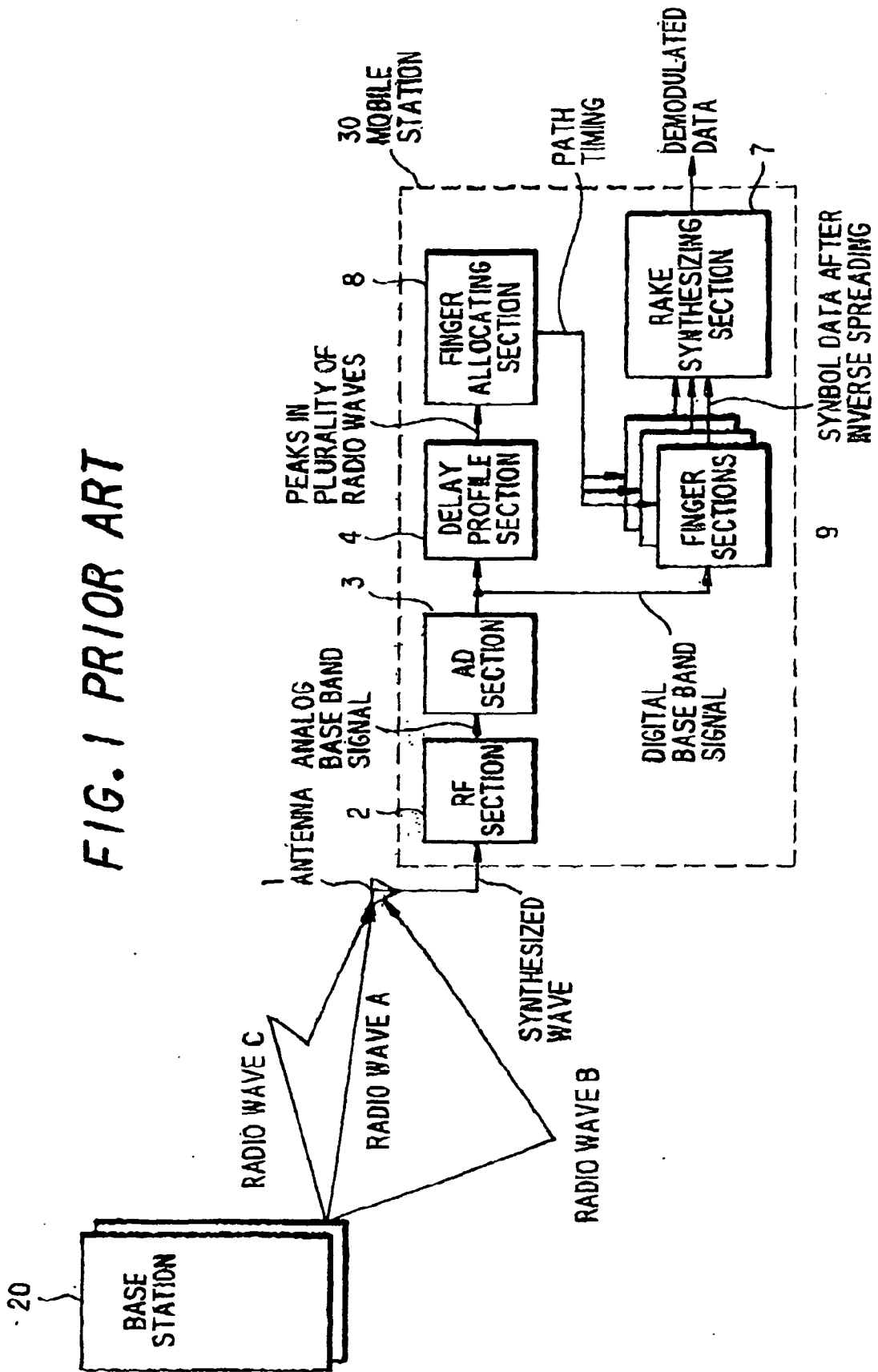
détecter chaque pic de ladite pluralité d'ondes radioélectriques pour affecter une chronologie de trajectoire correspondant à chaque pic des positions détectées à chacune de ladite pluralité de sections de doigt (6) ; et 40  
 décider d'une portée de relevé de trajectoire dans chacune de ladite pluralité de sections de doigt (6) ; ledit procédé étant **caractérisé en ce que** 45  
 ladite pluralité d'ondes radioélectriques est inversement propagée au sein de ladite portée de relevé de trajectoire dans des segments positionnés avant et après ladite chronologie de trajectoire dans chacune de ladite pluralité de sections de doigt (6), ledit procédé comprenant en outre l'étape consistant à ; 50  
 informer chacune de ladite pluralité de sections de doigt à propos de ladite portée de relevé de trajectoire ; et chacune de ladite pluralité de sections de doigt (6) rend ladite portée de relevé de trajectoire variable d'après ladite instruction, 55

dans lequel :

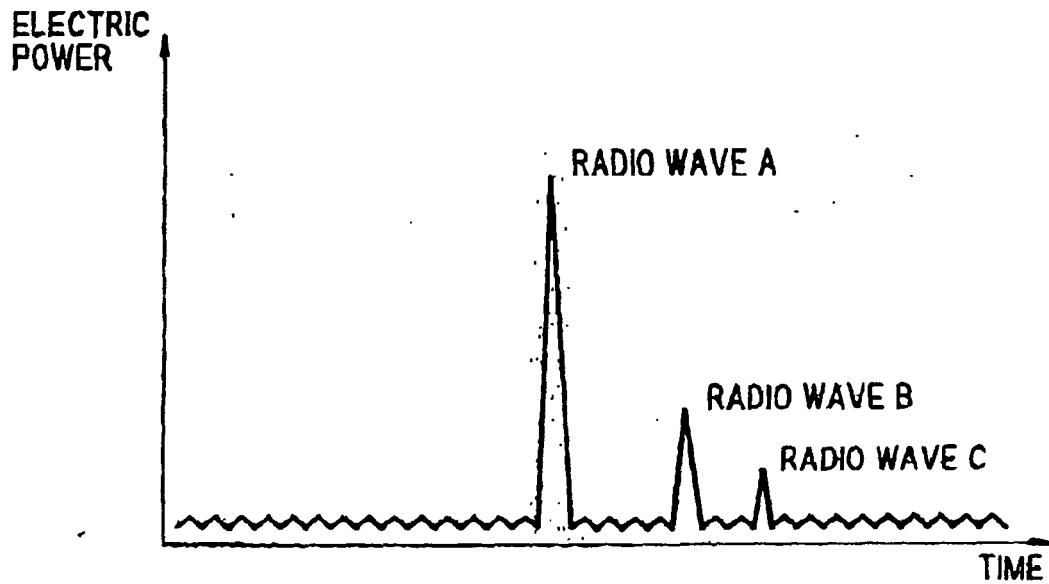
ladite portée de relevé de trajectoire dans chacune de ladite pluralité de sections de doigt (6) est décidée d'après chaque distance de positions pics dans ladite pluralité d'ondes radioélectriques.



FIG. 1 PRIOR ART



**FIG.2 PRIOR ART**



**FIG.3 PRIOR ART**

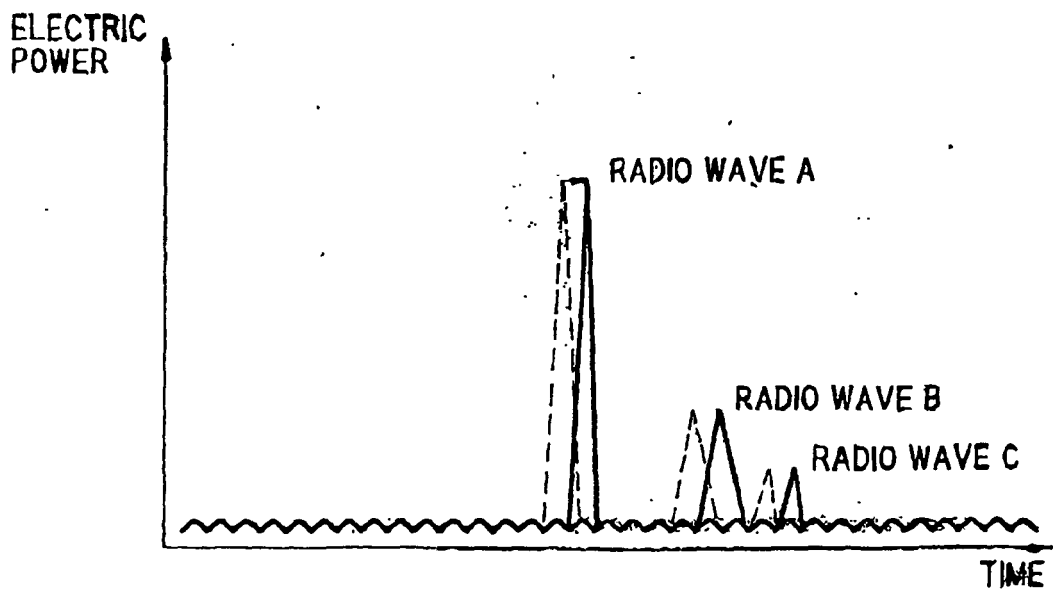
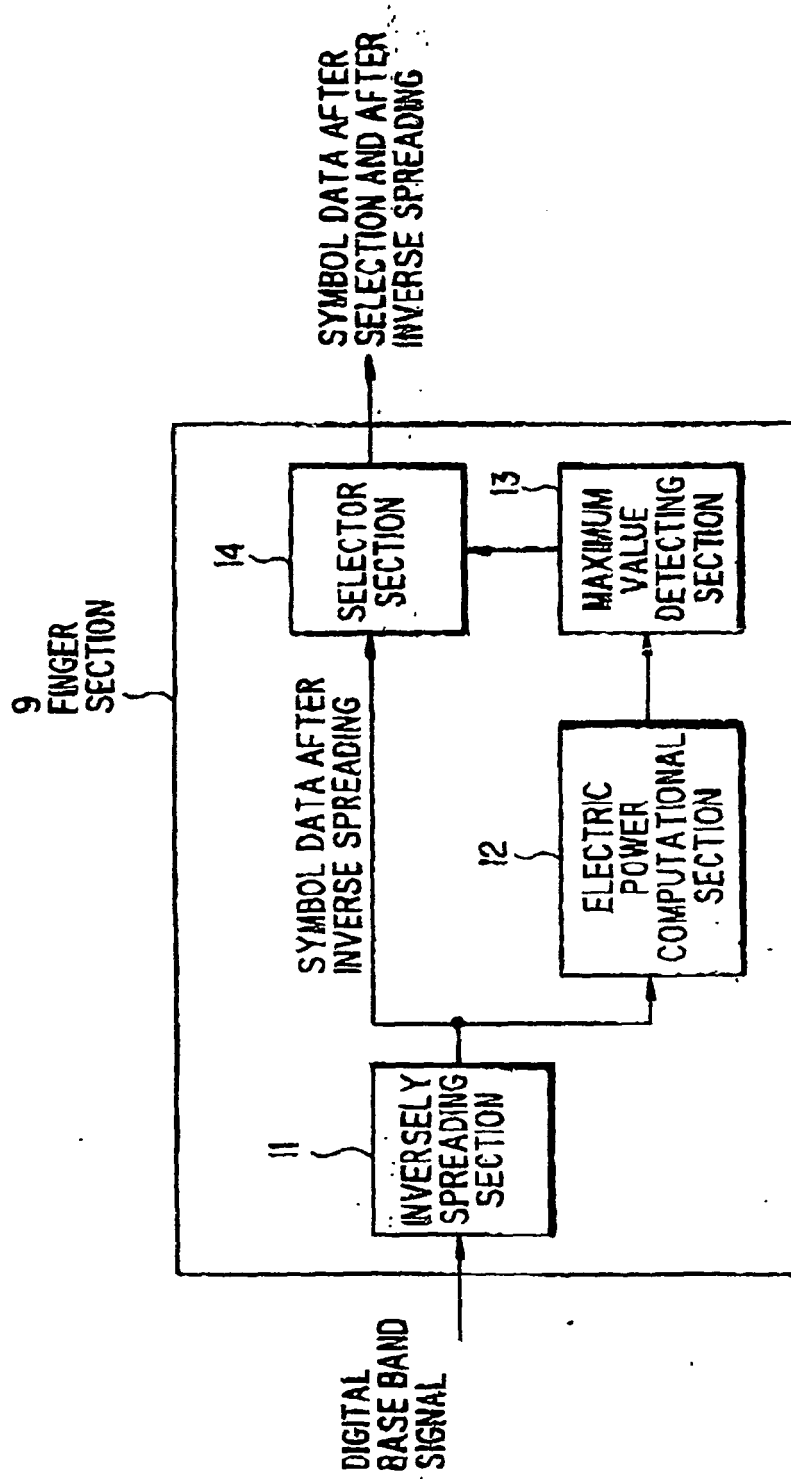
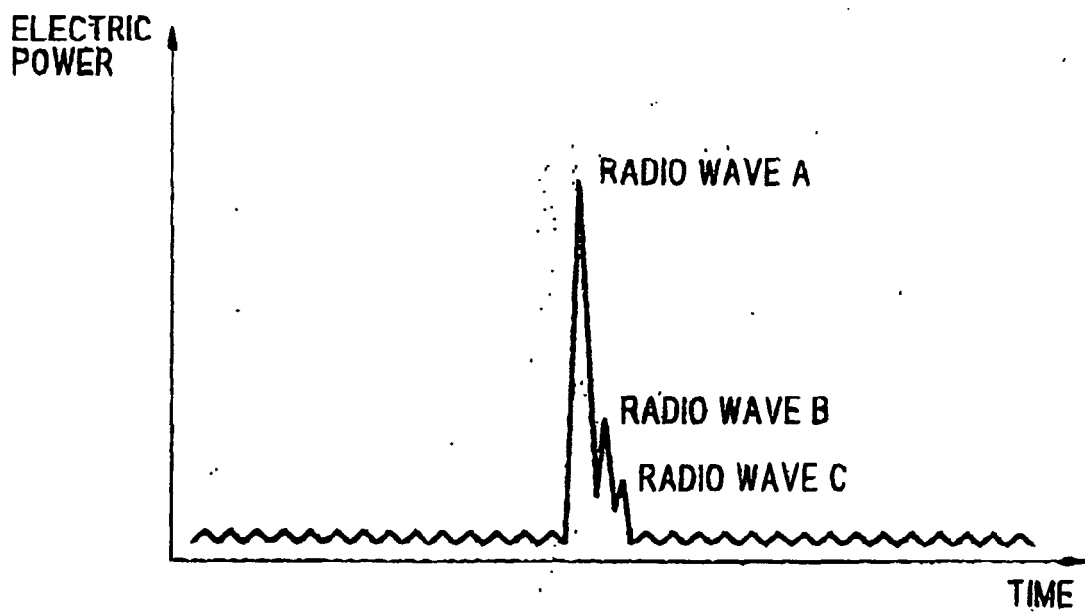
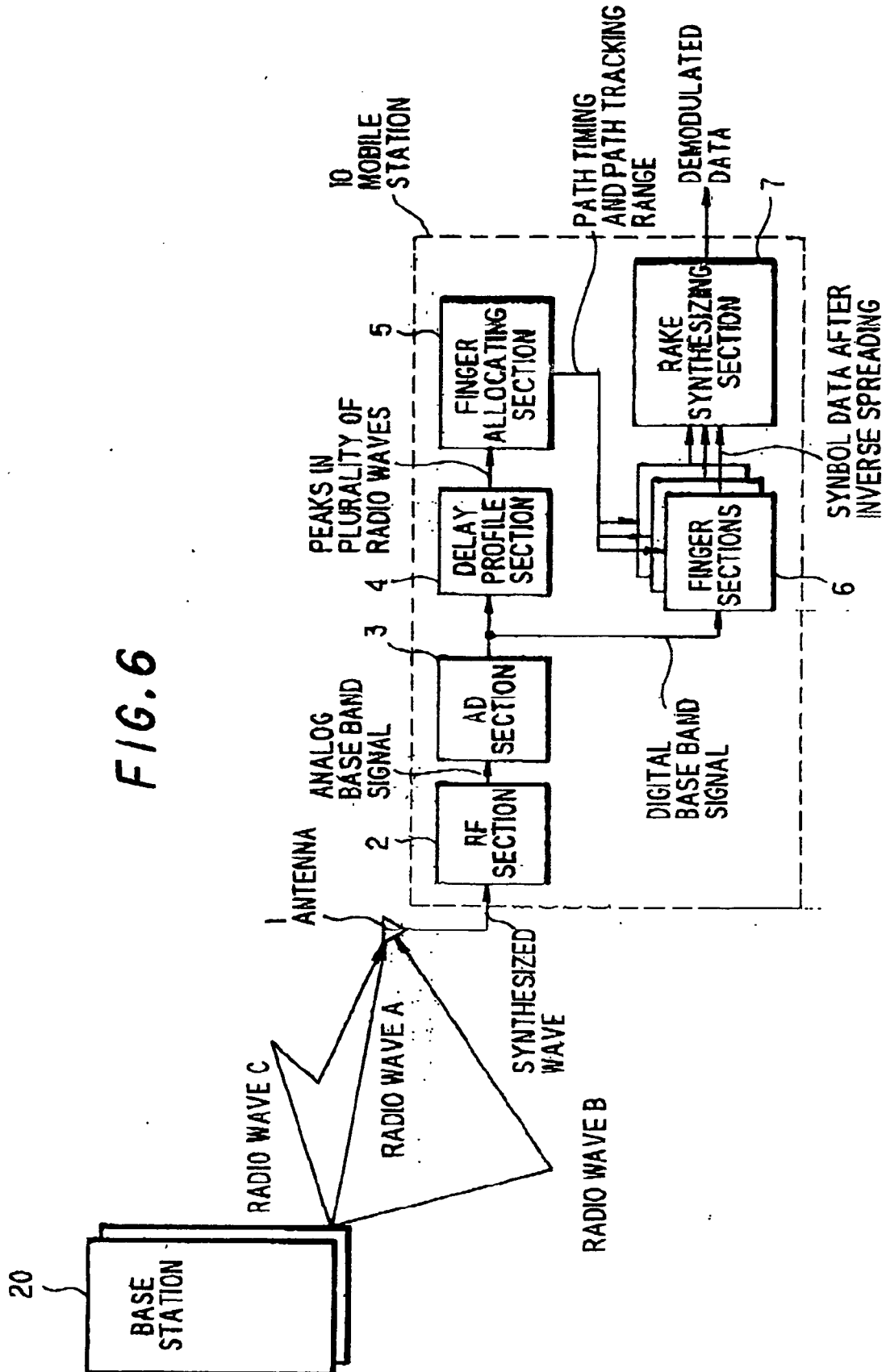


FIG. 4 PRIOR ART



**FIG.5 PRIOR ART**





**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- WO 9740398 A [0025]