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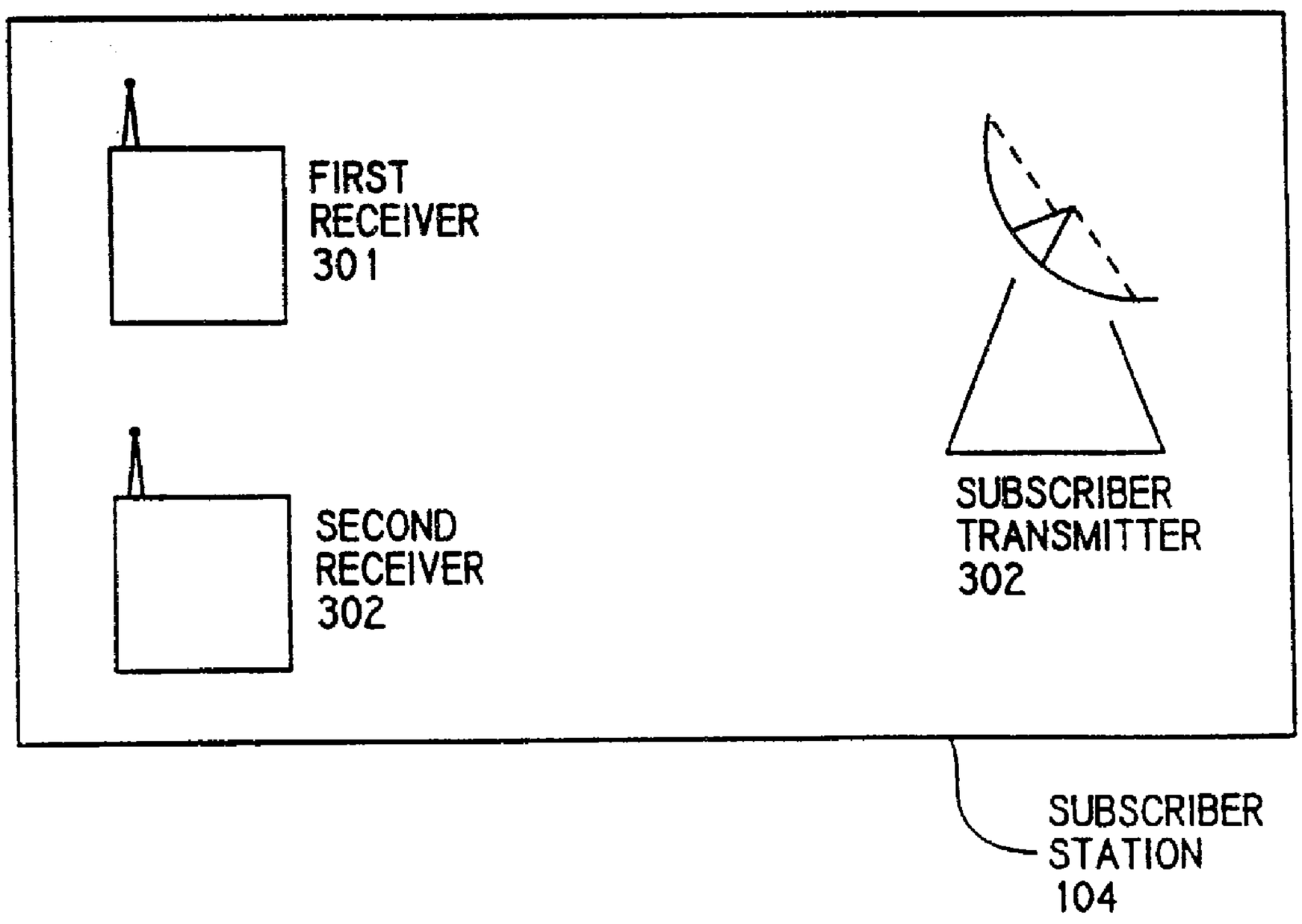
(54) **SYSTEME DE DIFFUSION DE DONNEES A SPECTRE ETALE**

(54) **SPREAD-SPECTRUM DATA PUBLISHING SYSTEM**



(57) Système de publication de données (409) sur canaux d'émission partagés mettant en oeuvre des techniques à étalement de spectre, pouvant comprendre un codeur à étalement de spectre (405) capable de recevoir des données et de les disposer selon un format (407) de signal à étalement de spectre, et un émetteur (406) fonctionnant sur un canal ou une bande de fréquence partagé, du type de ceux qui peuvent être attribués pour des communications terrestres d'un point à un autre. Le canal de communication partagé peut comprendre un système cellulaire, dans lequel les données (409) sont transmises (406) selon des techniques à étalement de

(57) A system for publishing data (409) on shared broadcast channels using spread- spectrum techniques, which may comprise a spread-spectrum encoder (405) capable of receiving data and placing it in a spread-spectrum signal format (407) and a transmitter (406) operating on a shared communication channel or frequency band, such as might be allocated to terrestrial point-to-point or broadcast communications. The shared communication channel may comprise a cellular system, in which data (409) may be transmitted (406) using spread-spectrum techniques using the transmitters (406) and repeaters of the cellular system simultaneously with

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spectre mettant en oeuvre les émetteurs (406) et les répéteurs du système cellulaire en même temps que les transmissions en phonie et autres transmissions associées au système. Une station d'abonnés peut effectuer la réception grâce à une multiplicité de canaux ou de bandes de fréquence, comme, par exemple, un premier récepteur peut effectuer une réception cellulaire et un deuxième récepteur une réception satellite, l'un au moins utilisant des techniques à étalement de spectre. La station d'abonnés peut également comporter un émetteur utilisant au moins un canal ou une bande de fréquence, de telle sorte qu'elle peut recevoir des données ou d'autres transmissions utilisant un canal et demander d'autres données ou d'autres transmissions en utilisant un deuxième canal.

voice and outer transmissions associated with the cellular system. A subscriber station may be capable of receiving using a plurality of different communication channels or frequency bands, such as a first receiver capable of cellular reception and a second receiver capable of satellite reception, at least one of which uses spread-spectrum techniques. The subscriber station may also comprise a transmitter using at least one communication channel or frequency band, so that the subscriber station may receive data or other transmissions using one channel and may request further data or other transmissions using a second channel.

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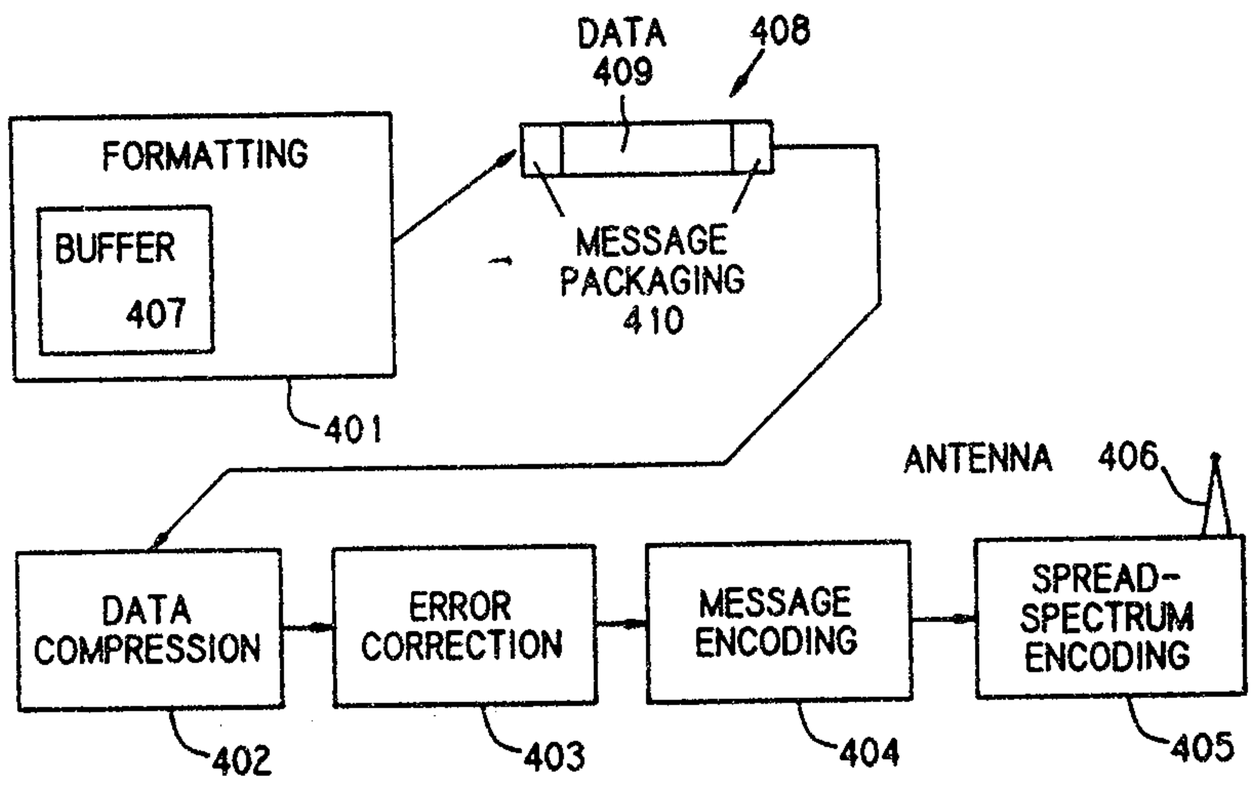

(57) Abstract

A system for publishing data (409) on shared broadcast channels using spread-spectrum techniques, which may comprise a spread-spectrum encoder (405) capable of receiving data and placing it in a spread-spectrum signal format (407) and a transmitter (406) operating on a shared communication channel or frequency band, such as might be allocated to terrestrial point-to-point or broadcast communications. The shared communication channel may comprise a cellular system, in which data (409) may be transmitted (406) using spread-spectrum techniques using the transmitters (406) and repeaters of the cellular system simultaneously with voice and other transmissions associated with the cellular system. A subscriber station may be capable of receiving using a plurality of different communication channels or frequency bands, such as a first receiver capable of cellular reception and a second receiver capable of satellite reception, at least one of which uses spread-spectrum techniques. The subscriber station may also comprise a transmitter using at least one communication channel or frequency band, so that the subscriber station may receive data or other transmissions using a second channel.

DESCRIPTION

Spread-Spectrum Data Publishing System

Background Of The Invention

1. Field of the Invention

This invention relates to a system for publishing data by broadcast or related technology. More specifically, this invention relates to a system for publishing data on shared channels using spread-spectrum techniques.

2. Description of Related Art

Data publishing is the process of transmitting data to recipients by means of electronic communication channels, such as broadcast or related communication methods. One motive for data publishing is that it may be easier or less expensive to transmit data to recipients by means of broadcast than it would be to write that data onto physical media (such as paper or magnetic disks or tapes) and carry the physical media to them. Another motive is that the marginal cost of publishing the same data to an additional recipient may be comparatively small. Data publishing may be particularly advantageous when the data to be published are voluminous, rapidly changing, or must be delivered within a short time to be useful. A classic example of such data is stock-market trading data, although there are many other cases where data publishing would be advantageous.

One problem which has arisen in the art is the lack of sufficient broadcast infrastructure for data publishing. There are few if any broadcast towers, repeaters, or receivers for use with data publishing, so it has been generally necessary to use infrastructure which is already associated with another form of communication. Hence the use of telephone, television, radio and satellite systems noted above. Accordingly, it

would be advantageous to provide a method of data publishing which did not require construction of large amounts of additional infrastructure.

Another problem which has arisen in the art is that it may be difficult to obtain sufficient bandwidth, at reasonable cost and without excessive difficulty, to publish the data. Lack of bandwidth naturally either reduces the amount of data which can be published, or increases the amount of time which is required to publish the data to recipients.

One method of the prior art is to make use of spare bandwidth from an extant communication system. Examples include telephone (using data-over-voice), television (using vertical blanking intervals), and radio (using FM sidebands) systems. While this method achieves a limited degree of success, it has been subject to the drawback that it has not been able to deliver bandwidth to support publishing of large amounts of data. For example, while television systems have a great deal of broadcast bandwidth, the amount of bandwidth for data publishing available by means of the vertical blanking interval is relatively limited. Another problem is that this prior art method does not generally provide national coverage.

Another method of the prior art is to allocate separate frequency bands in which to publish the data. Examples of this method include satellite systems with dedicated channels. While this method is able to deliver a greater amount of bandwidth for data publishing, it has been subject to the drawback that allocation of separate frequency bands for data publishing may generally require proceedings before the FCC or other government agencies.

Another method of the prior art is to use leased lines or other telephone lines to publish the data serially to multiple receiving sites. While this method is able to deliver the data to receiving sites, it has been subject to the drawback that it requires a great deal

of money in leased line charges or telephone charges, and therefore may not be economical.

Accordingly, it would be advantageous to provide a method of data publishing which allowed easier access to sufficient bandwidth for data publishing.

Summary of the Invention

The invention provides a system for publishing data on shared broadcast channels using spread-spectrum techniques. The system may comprise a spread-spectrum encoder capable of receiving data and placing it in a spread-spectrum signal format and a transmitter operating on a shared communication channel or frequency band, such as might be allocated to terrestrial point-to-point or broadcast communications. In a preferred embodiment, the shared communication channel may comprise a cellular system, in which data may be transmitted using spread-spectrum techniques using the transmitters and repeaters of the cellular system simultaneously with voice and other transmissions associated with the cellular system.

In a preferred embodiment, a subscriber station may be capable of receiving using a plurality of different communication channels or frequency bands, such as a first receiver capable of cellular reception and a second receiver capable of satellite reception, at least one of which uses spread-spectrum techniques. The subscriber station may also comprise a transmitter using at least one communication channel or frequency band, so that the subscriber station may receive data or other transmissions using one channel and may request further data or other transmission using a second channel. For example, the subscriber station may comprise a cellular transmitter and receiver, and a satellite receiver.

Then invention may be summarized, according to a first broad aspect a method for broadcasting, comprising the steps of:

receiving information to be broadcast; generating a first signal comprising a representation of said information to be broadcast in a spread spectrum format; transmitting said first, spread spectrum, signal contemporaneously with receiving a second signal and transmitting a third signal, said second signal and said third signal each transmitted in a channel of said frequency range.

According to another aspect, the invention provides a broadcast system comprising a subsystem and at least one subscriber station; said subsystem comprising a subsystem spread spectrum encoder, said subsystem spread spectrum encoder comprising an encoder input comprising information to be broadcast to said at least one subscriber station and comprising an output comprising an encoder output signal including a representation of said information to be broadcast in a spread spectrum format; said subsystem further comprising a subsystem transmitter, said subsystem transmitter coupled to said spread spectrum encoder and comprising a subsystem transmitter input comprising said encoder output signal, said subsystem transmitter comprising an output comprising a spread spectrum signal, said spread spectrum signal spread over a frequency range comprising a communication channel; and said subscriber station comprising a first subscriber station receiver, a second subscriber station receiver and a subscriber station transmitter, wherein said first subscriber station receiver comprises capability for receiving spread spectrum signals, said second subscriber station receiver comprises capability for receiving signals on said communication channel, and said subscriber station transmitter comprises capability for transmitting signals on said communication channel, and wherein said first subscriber station receiver is capable of receiving a signal contemporaneously with said subscriber station transmitter transmitting a signal.

According to yet another aspect, the invention provides a broadcast system comprising a subsystem and at least one subscriber station; said subsystem comprising a subsystem transmitter having a subsystem transmitter input comprising information to be broadcast to said at least one subscriber station, said subsystem transmitter having an output comprising a signal on a communication channel; said subscriber station comprising a first subscriber station receiver, a second subscriber station receiver and a subscriber station transmitter, wherein said first subscriber station receiver comprises capability for receiving signals on said communication channel, said second subscriber station receiver comprises capability for receiving spread spectrum signals, and said subscriber station transmitter comprises capability for transmitting a spread spectrum signal, said spread spectrum signal spread over a frequency range which comprises said communication channel, and wherein said first subscriber station receiver is capable of receiving a signal on said communication channel contemporaneously with said subscriber station transmitter transmitting a spread spectrum signal.

Brief Description of the Drawings

Figure 1 shows a block diagram of a system for data publishing.

Figure 2 shows a block diagram of a cellular system communication channel in a system for data publishing.

Figure 3 shows a block diagram of a subscriber station.

Figure 4 shows a block diagram of a transmitter station.

Description Of The Preferred Embodiment

Figure 1 shows a block diagram of a system for data publishing.

A system for data publishing may comprise a data source 101, a transmitter station 102, a communication channel 103, and a subscriber station 104. The data source 101 may originate the data to be published (or may format it for publication). The transmitter station 102 may receive the data and place it in a spread-spectrum signal format for transmission over the communication channel 103. The communication channel 103 may couple the data (in a spread-spectrum signal format) to one or more subscriber stations 104. The subscriber stations 104 may receive the data and decode it from the spread-spectrum format.

In a preferred embodiment, the data source 101 may originate (or format) a variety of different types of data to be published. These may include: text, graphics, digitized voice, digitized images or moving video, or mixed media; financial, news and weather data, including digitized photos and weather maps; airline and rail scheduling data; updates for in-store retail displays, including high-resolution graphic advertisements and animation; credit and credit card data for in-store approval and verification; encyclopedia or other database contents, including chemical, legal, medical, and pharmacological databases, and advertising and telephone listings; high-quality telecopier images and other print images; and updates for documentation manuals, including airline, automotive and computer manuals.

The data to be transmitted by the transmitter station 102 may potentially take the form of a powered electromagnetic signal comprising a representation in a spread-spectrum format of the data to be published, spread over a frequency band. In an alternative embodiment, the data to be transmitted by the transmitter station 102 may take the form of a composite powered electronic signal comprising the data to be published, in a first, spread-spectrum format signal, overlaid with a second signal in a non-spread-spectrum format.

In a preferred embodiment, the subscriber stations 104 may each comprise a multitasking processor which may perform communication tasks in parallel with other tasks, and which may be coupled to a LAN (local area network) or WAN (wide area network) for retransmitting data to other cooperating processors.

In a preferred embodiment, the communication channel 103 may comprise a satellite system 105, having an uplink station 106, a satellite and transponder 107 (preferably with a wide area footprint), and a downlink station 108, as is well known in the art of satellite communication. The uplink station 106 may be coupled to the transmitter station 102; the downlink station 108 may be coupled to the subscriber station 104 and may comprise an indoor mountable one-foot antenna, as is well known in the art of satellite communication.

In an embodiment, the communication channel 103 may comprise a predetermined set of frequencies. Furthermore, the communication channel 103 may be shared with other types of transmissions, such as a nondata transmission, a nondigital transmission, or a voice transmission.

In a preferred embodiment, the transmitter station 102 and the subscriber station 104 may comprise inventions disclosed in U.S. Patents 5,016,255, 5,022,047, and 5,081,642, in PCT

Publication No. WO 92/02094, in Canadian Patent Application No. 2,094,710, filed October 3, 1991 now Canadian Patent No. 2,094,710 issued December 1, 1998 and in Canadian Patent Application No. 2,102,914 filed May 11, 1992.

Figure 2 shows a block diagram of a cellular system communication channel in a system for data publishing.

In a preferred embodiment, the communication channel 103 may comprise a shared communication channel or frequency band, such as might be allocated to terrestrial point-to-point or broadcast communications. In particular, in a preferred embodiment, the communication channel 103 may comprise a cellular system 201, with a set of base stations 202 and a set of cells 203. In the cellular system 201, the data to be published may be transmitted using the frequency bands allocated to the cellular system 201, from the transmitter station 102 to a transmitter base station 202, to a receiver base station 202 (possibly by means of a set of repeaters 204), to a user station 205. In a preferred embodiment, the transmitter station 102 may be collocated with the transmitter base station 202, may be coupled thereto by means of cabling, and may even share the same antenna. Return messages may be transmitted from the user station 205 to the transmitter station 102 in like manner.

Because the data to be published is transmitted in a spread-spectrum signal format, it may use the same frequency bands allocated to the cellular system 201 simultaneously with other transmissions associated with the cellular system 201 and without interfering with those other transmissions. Moreover, the data to be published (in its spread-spectrum signal format) may be routed in the cellular system 201 and transmitted from base station 202 to base station 202 without loss of data and without substantial modification of the cellular system 201.

In a preferred embodiment, the cellular system 201 may comprise inventions disclosed in Canadian Patent Application Nos. 2,107,898 and 2,110,589 filed April 3, 1992 and June 2, 1992, respectively.

Figure 3 shows a block diagram of a subscriber station.

In a preferred embodiment, the subscriber station 104 is capable of receiving more than one signal simultaneously on a plurality of different communication channels. In an embodiment, the subscriber station 104 may comprise a first receiver 301 operating on a first communication channel 103 and a second receiver 301 operating on a second communication channel 103. In a preferred embodiment, at least one of the communication channels 103 uses spread-spectrum techniques. For example, in a preferred embodiment, the first communication channel 103 may comprise the cellular system 201 shown in figure 2, and the second communication channel 103 may comprise the satellite system 105 shown in figure 1.

In a preferred embodiment, the subscriber station 104 may also comprise a subscriber transmitter 302 operating on a third communication channel 103, and the transmitter station 102 may comprise a receiver operating on that third communication channel 103. For example, in a preferred embodiment, the third communication channel 103 may also comprise the cellular system 201 shown in figure 2 (i.e., the third communication channel 103 is the same as the first communication channel 103), so that the cellular system 201 may be used for two-way communication between the transmitter station 102 and the subscriber station 104. In other embodiments, the third communication channel 103 may comprise other forms of a shared terrestrial communication channel.

The subscriber station 104 may thus receive data to be published (as well as other information described with reference to figure 1), by means of the cellular system 201 or the satellite system 105, and respond, by means of the cellular system 201. The response may comprise a request for further data or other transmissions by means of the satellite system

105, and the transmitter station 102 may answer that request with further data transmitted by means of the satellite system 105.

In another embodiment, one or more data transmissions may be sent to the subscriber station 104 via both the first communication channel 103 and the second communication channel 103. The subscriber station 104 may then transmit a request to the transmitter station 102, to receive data on the second communication channel 103, in response to data received on the first communication channel 103. The transmitter station 102, after receiving the request, may thereafter transmit data on the second communication channel 103 to the subscriber station 104.

Figure 4 shows a block diagram of a transmitter station.

In one embodiment, the transmitter station 102 may operate on a terrestrial communication channel, said channel being shared with simultaneous communication in non-spread spectrum format.

The transmitter station 102 may comprise a formatting module 401 for receiving data from the data source 101, a data compression module 402, an error correction module 403, a message encoding module 404, a spread-spectrum encoding module 405, and a transmitting antenna 406.

In a preferred embodiment, the formatting module 401 may comprise a buffer 407 for receiving data from the data source, and may generate a message signal 408 comprising the data to be published 409 and message packaging data 410, as is well known in the art of message transmission protocols. For example, in a preferred embodiment, messages may be addressed to individual subscriber stations 104 by indicating a 32-bit individual address in the message packaging data 410. In a preferred embodiment, the formatting module 401 may format data for

a plurality of data channels, may multiplex the data to be published on each data channel, and may divide each data channel into up to 256 logical subchannels.

In combination with a request by the subscriber station 104 for particular data or data services, the formatting module 401 may also generate usage data and related statistical data by review of the buffer 407 and the message packaging data 410. In a preferred embodiment, the formatting module 401 may generate usage data which correlates each subscriber station 104 with the data to be decoded by that subscriber station 104, and that usage data may be used to compute charges for subscribers stations 104 and to rate demand for particular data or data services.

In a preferred embodiment, the formatting module 401 may format text data in ASCII format, and may format image data in bitmap format at a resolution of 300 x 300 dots per inch, or more preferably, 400 x 400 dots per inch.

The data compression module 402 may encode the data to be published into a more compact form, as is well known in the art of data compression. In a preferred embodiment, the data compression module may use a group III data compression technique for data which is designated to be output to a telecopier. In a preferred embodiment, data compression module may use an ASCII compression technique for text data which is keyword searchable in compressed form, and may use a compression technique for image data which is automatically scaled for output to lower resolution printers or for display on graphics monitor. Data compression techniques which do not use "alphabet extension" are preferred.

The error correction module 403 may encode the data to be published by adding error detection and correction information, as is well known in the art of error detection and correction. In a preferred embodiment, the error correction module 403 may use a forward error correction technique which adapts the degree of error

detection and correction information to the type of data to be published, and which further adapts the degree of error detection and correction information to real-time error characteristics of the communication channel 103.

The message encoding module 404 may encode the data to be published to preserve its security against unauthorized reception. In a preferred embodiment, the message encoding module 404 may use a nonlinear cipher feedback shift register technique which processes data at about 10 kilobytes per second. In a preferred embodiment, data to be published may be divided into "files" and each file encoded with a file-specific key, and when received at the subscriber station, re-encoded after receipt with a station-specific or device-specific key. In a preferred embodiment, the message encoding module 404 may comprise a hardware encoding device which encodes one byte at a time.

In an embodiment, the transmitter station 102 broadcasts a plurality of data signals on shared broadcast channels, using spread-spectrum and non-spread spectrum techniques. In an embodiment, the transmitter station 102 broadcasts at least one spread-spectrum signal and at least one non-spread-spectrum signal. The spread-spectrum signal is broadcast at low power relative to the non-spread-spectrum signal, in order that the reception of the non-spread-spectrum signal is not disrupted by the spread-spectrum signal. In one embodiment, a subscriber station receiver 301 has the capability to receive the low signal to noise ratio spread spectrum signal, in order that the spread-spectrum signal is properly interpreted despite the presence of the relatively high power non-spread-spectrum signal. In another embodiment, a subscriber station receiver 301 has the capability to receive the spread-spectrum signal with a high process gain, in order that the spread-spectrum

signal is properly interpreted despite the presence of the relatively high power non-spread-spectrum signal. In yet another embodiment, a subscriber station receiver 301 has the capability to receive the spread-spectrum signal with a high jamming coefficient, again in order that the spread-spectrum signal is properly interpreted despite the presence of the relatively high power non-spread-spectrum signal.

In another embodiment, the transmitter station 102 broadcasts a plurality of signals on shared broadcast channels, using spread-spectrum and FM broadcast techniques. In an embodiment, the transmitter station 102 broadcasts at least one spread-spectrum signal and at least one FM signal. A subscriber station 104 comprises the capability for receiving the spread-spectrum signal on a subscriber station receiver 301 capable of receiving and decoding the spread-spectrum signal. The subscriber station 104 further comprises the capability of receiving the FM signal on a second, conventional FM subscriber station receiver 301.

In yet another embodiment, the transmitter station 102 broadcasts a plurality of signals on one or more shared communication channels. The transmitter station 102 transmits one or more high process gain signals in a manner which results in a high process gain when the signal(s) are received and demodulated by a subscriber station receiver 103. The transmitter station 102 further modulates at least one other signal, and transmits this other, modulated, signal at high power relative to the high process gain signal(s). A second subscriber station receiver 103 comprises the capability of receiving this other, modulated, signal, and demodulating it in spite of the presence of one or more of the high process gain signals. In an embodiment, the shared communication channels are cellular telephone channels. The transmitter station 102

encodes at least one signal in a high process gain format in the frequency range of the cellular telephone system, and encodes at least one other, second, signal in a conventional cellular telephone broadcast format. The transmitter station 102 then simultaneously broadcasts both a high process gain signal and a conventional cellular telephone signal. A subscriber station receiver 301 comprises the capability for receiving and decoding the high process gain format signal(s). In an embodiment, a second subscriber station receiver 301 comprises the capability for receiving the second, conventional cellular telephone broadcast format signal(s). In an alternative embodiment, other receivers in the cellular telephone system receive the second, conventional cellular telephone broadcast format signal(s) in the conventional manner.

In yet another embodiment, data may be transmitted by the transmitter station 102 in a background signal on a preexisting communications network, while using the network to carry other signals. In an embodiment, the transmitter station 102 encodes the data to be transmitted in the background signal in a manner which allows high process gain reception. The transmitter station 102 then transmits the data at low power relative to the other signals carried on the network. In this manner, the other signals are received by receivers in the preexisting communication network despite the presence of the background signal.

Alternative Embodiments

While preferred embodiments are disclosed herein, many variations are possible which remain within the concept and scope of the invention, and these variations would become clear to one of ordinary skill in the art after perusal of the specification, drawings and claims herein.

In particular, a preferred embodiment of the invention is shown in which data to be published is broadcast by means of a satellite link from ~~an~~ transmitting station to a subscriber station. However, it would be clear to one of ordinary skill in the art, after perusal of the specification, drawings and claims herein, that the invention is also applicable to many different forms of transmission and media for broadcast. These many different forms of transmission and media for broadcast, would be workable, and are within the scope and spirit of the invention.

For example, it would be clear to one of ordinary skill in the art that the invention would be equally workable with cable TV media, without essential change.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A broadcast system comprising a subsystem and at least one subscriber station;

said subsystem comprising a subsystem spread spectrum encoder, said subsystem spread spectrum encoder comprising an encoder input comprising information to be broadcast to said at least one subscriber station and comprising an output comprising an encoder output signal including a representation of said information to be broadcast in a spread spectrum format;

said subsystem further comprising a subsystem transmitter, said subsystem transmitter coupled to said spread spectrum encoder and comprising a subsystem transmitter input comprising said encoder output signal, said subsystem transmitter comprising an output comprising a spread spectrum signal, said spread spectrum signal spread over a frequency range comprising a communication channel; and,

said subscriber station comprising a first subscriber station receiver, a second subscriber station receiver and a subscriber station transmitter, wherein said first subscriber station receiver comprises capability for receiving spread spectrum signals, said second subscriber station receiver comprises capability for receiving signals on said communication channel, and said subscriber station transmitter comprises capability for transmitting signals on said communication channel, and wherein said first subscriber station receiver is capable of receiving a signal contemporaneously with said subscriber station transmitter transmitting a signal.

2. The broadcast system of claim 1, wherein said communication channel comprises a channel of an existing cellular system.

3. The broadcast system of claim 1, wherein said second subscriber station receiver comprises capability for cellular technology reception and said first subscriber station receiver comprises capability for satellite technology reception.

4. The broadcast system of claim 3, wherein said second subscriber station receiver comprises capability for receiving a narrowband signal and said subscriber station transmitter comprises capability for transmitting a narrowband signal.

5. The broadcast system of claim 1, wherein said subsystem further comprises a subsystem receiver, said subsystem receiver comprising capability for receiving signals on said communication channel.

6. The broadcast system of claim 5, wherein said subscriber station transmitter transmits a signal to said subsystem receiver.

7. The broadcast system of claim 1, wherein said subsystem further comprises information formatting capability, including a data buffer, which has an information formatting output, said information formatting output comprising formatted information, said formatted information comprising an input to said spread spectrum encoder.

8. The broadcast system of claim 7, wherein said information to be broadcast is transmitted in a broadcast channel and said broadcast channel comprises a broadcast communication channel or a point-to-point communication channel.

9. The broadcast system of claim 8, wherein said broadcast channel comprises a point-to-point communication channel, said information to be broadcast comprises a plurality of messages,

and said information formatting capability further comprises functionality for addressing a message of said plurality of messages to said subscriber station.

10. The broadcast system of claim 1, wherein said subsystem further comprises message packing capability, said message packing capability having an output comprising packetized data, said packetized data comprising an input to said spread spectrum encoder.

11. The broadcast system of claim 1, wherein said subsystem further comprises a compression capability, said compression capability comprising functionality for encoding a signal, wherein said encoded signal comprises an input to said spread spectrum encoder.

12. The broadcast system of claim 1, wherein said subsystem further comprises an error correction capability, said error correction capability comprising an output comprising said information to be broadcast encoded for error detection and correction, said error detection and correction encoded information comprising an input to said spread spectrum encoder.

13. The broadcast system of claim 1, wherein said information to be broadcast comprises signals from the group comprising control signals, data, graphics, digitized voice, digitized images and moving video, and mixed media comprising any combination of control signals, data, graphics, digitized voice, digitized images or moving video.

14. The broadcast system of claim 1, wherein said subscriber station transmitter transmits information comprising a request

for said subsystem transmitter output to be broadcast to said subscriber station.

15. The broadcast system of claim 14, wherein said encoder input comprises a plurality of data messages and said subscriber station transmitter transmits information comprising a request for one or more of said plurality of data messages to be broadcast to said subscriber station.

16. A broadcast system comprising a subsystem and at least one subscriber station;

said subsystem comprising a subsystem transmitter having a subsystem transmitter input comprising information to be broadcast to said at least one subscriber station, said subsystem transmitter having an output comprising a signal on a communication channel;

said subscriber station comprising a first subscriber station receiver, a second subscriber station receiver and a subscriber station transmitter, wherein said first subscriber station receiver comprises capability for receiving signals on said communication channel, said second subscriber station receiver comprises capability for receiving spread spectrum signals, and said subscriber station transmitter comprises capability for transmitting a spread spectrum signal, said spread spectrum signal spread over a frequency range which comprises said communication channel, and wherein said first subscriber station receiver is capable of receiving a signal on said communication channel contemporaneously with said subscriber station transmitter transmitting a spread spectrum signal.

17. The broadcast system of claim 16, wherein said communication channel comprises a channel of an existing cellular system.

18. The broadcast system of claim 16, wherein said second subscriber station receiver comprises capability for cellular technology reception and wherein said first subscriber station receiver comprises capability for satellite technology reception.

19. The broadest system of claim 16, wherein said subsystem further comprises a subsystem receiver, said subsystem receiver comprising capability for receiving spread spectrum signals.

20. The broadcast system of claim 16. wherein said subscriber station transmitter transmits a spread spectrum signal to said subsystem receiver.

21. The broadcast system of claim 16, wherein said subscriber station transmitter transmits information comprising a request for said subsystem transmitter output to be broadcast to said subscriber station.

22. The broadcast system of claim 16, wherein said subsystem further comprises information formatting capability, including a data buffer, which has an information formatting output, said information formatting output comprising formatted information, said formatted information comprising an input to said subsystem transmitter.

23. The broadcast system of claim 21, wherein said information to be broadcast is transmitted in a broadcast channel and said broadcast channel comprises a broadcast communication channel or a point-to-point communication channel.

24. The broadcast system of claim 22, wherein said information to be broadcast is transmitted in a broadcast channel, said broadcast channel comprises a point-to-point communication channel, and said information to be broadcast comprises a plurality of messages, and said information formatting capability further comprises functionality for addressing a message of said plurality of messages to said subscriber station.

25. The broadcast system of claim 16, wherein said subsystem further comprises message packing capability, said message packing capability having an output comprising packetized data, said packetized data comprising an input to said subsystem transmitter.

26. The broadcast system of claim 16, wherein said subsystem further comprises a compression capability, said compression capability comprising functionality for encoding a signal, wherein said encoded signal comprises an input to said subsystem transmitter.

27. The broadcast system of claim 16, wherein said subsystem further comprises an error correction capability, said error correction capability comprising an output comprising said information to be broadcast encoded for error detection and correction, said error detection and correction encoded information comprising an input to said subsystem transmitter.

28. The broadcast system of claim 16, wherein said information to be broadcast comprises signals from the group comprising control signals, data, graphics, digitized voice, digitized images and moving video, and mixed media comprising any

combination of control signals, data, graphics, digitized voice, digitized images or moving video.

29. A method for broadcasting, comprising the steps of:

receiving information to be broadcast;

generating a first signal comprising a representation of said information to be broadcast in a spread spectrum format;

transmitting said first, spread spectrum, signal contemporaneously with receiving a second signal and transmitting a third signal, said second signal and said third signal each transmitted in a channel of said frequency range.

30. The method of broadcasting of claim 29, wherein said first, spread spectrum, signal is transmitted in a broadcast channel and said broadcast channel comprises a broadcast communication channel or a point-to-point communication channel.

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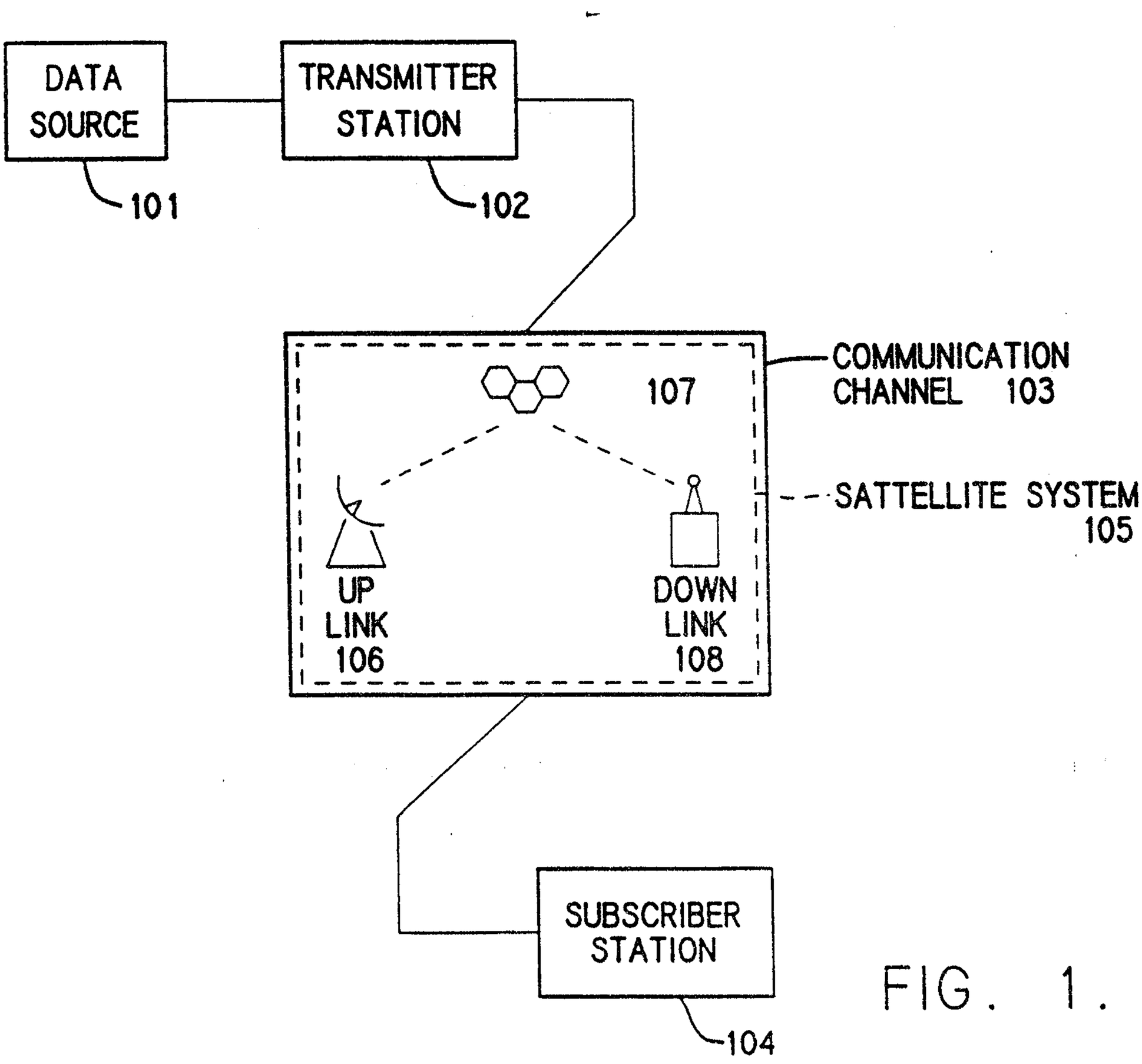

FIG. 1.

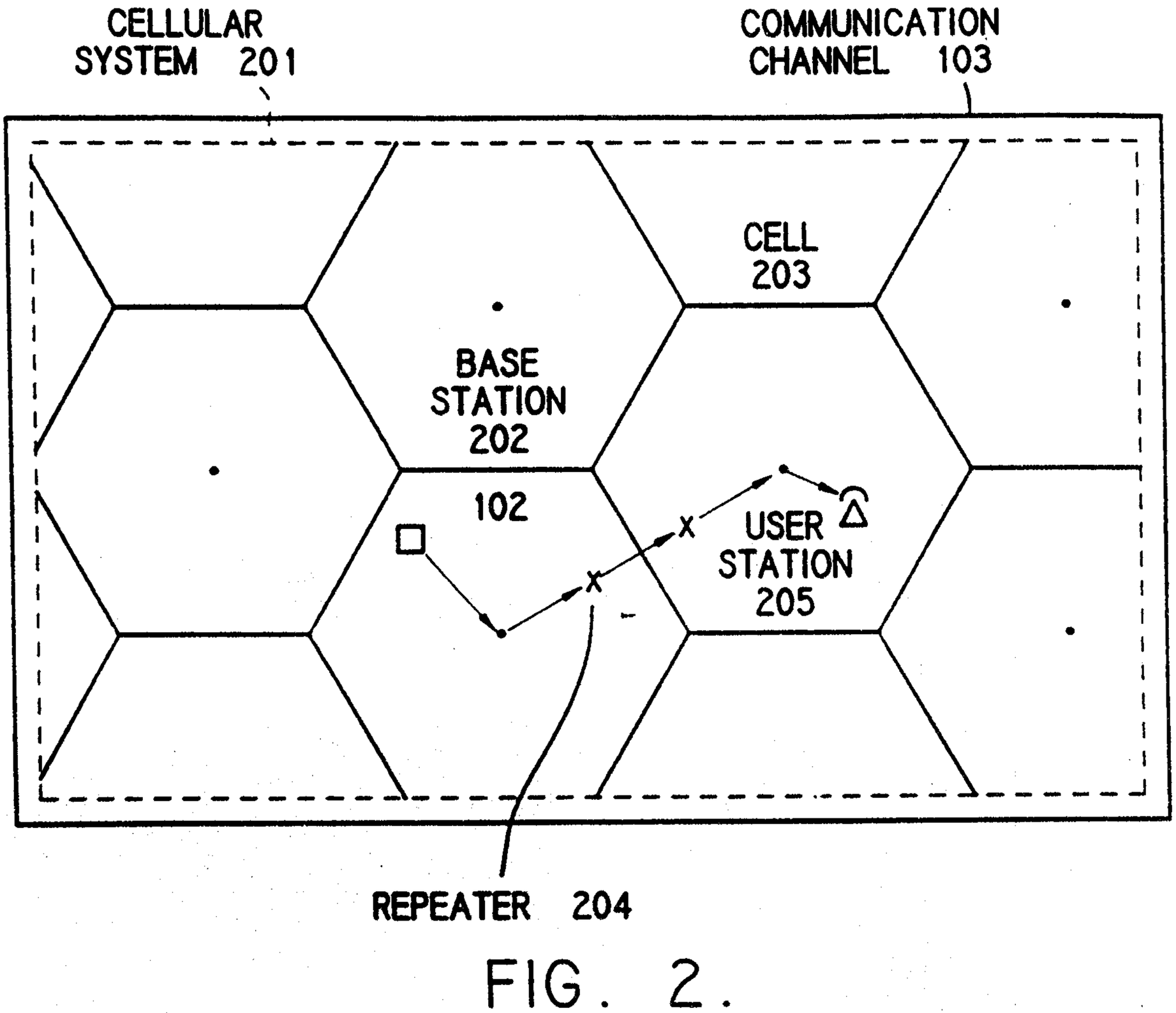
CELLULAR
SYSTEM 201
COMMUNICATION
CHANNEL 103
CELL
203
BASE
STATION
202
102
USER
STATION
205
REPEATER 204

FIG. 2.

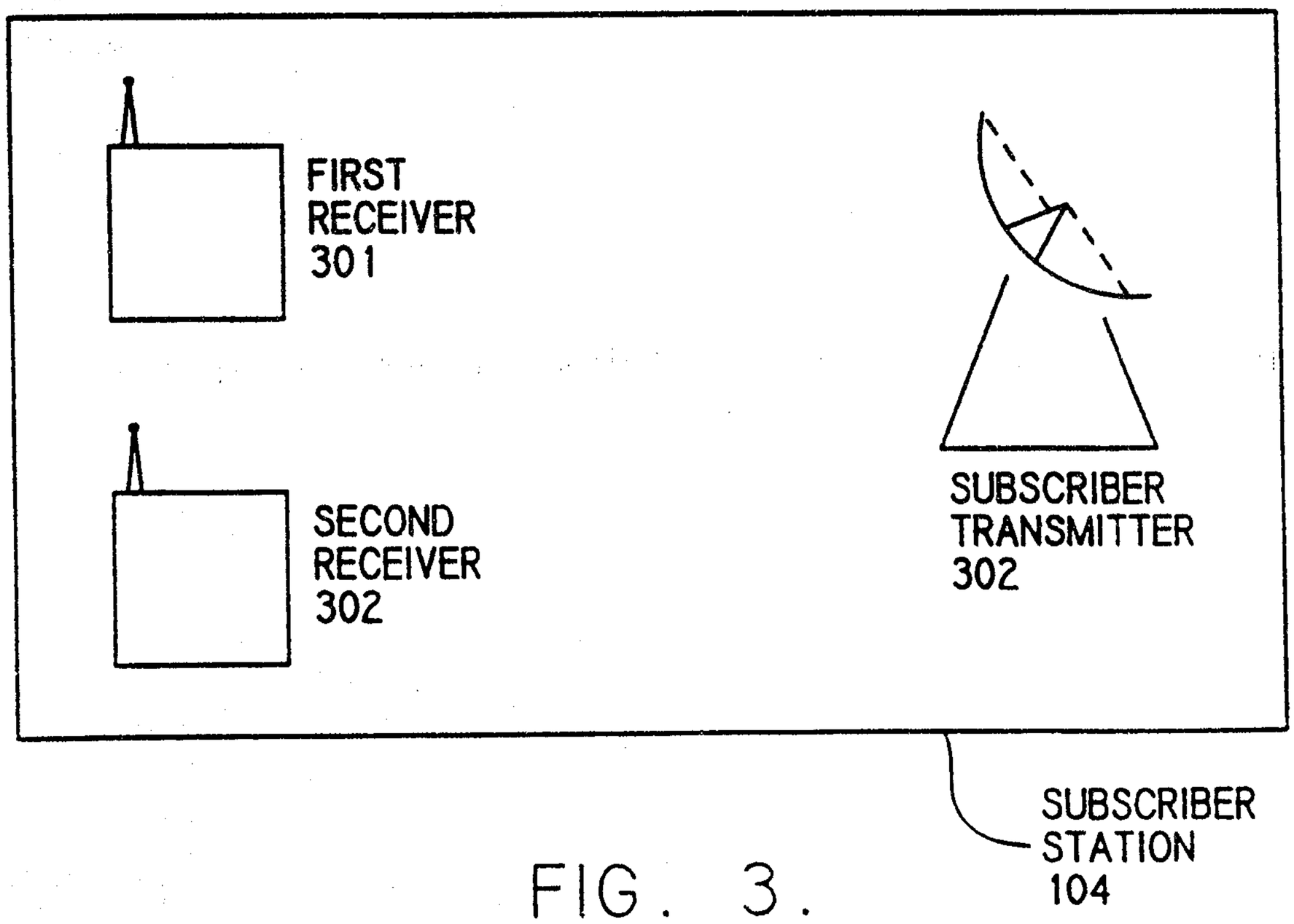
FIRST
RECEIVER
301
SECOND
RECEIVER
302
SUBSCRIBER
TRANSMITTER
302
SUBSCRIBER
STATION
104

FIG. 3.

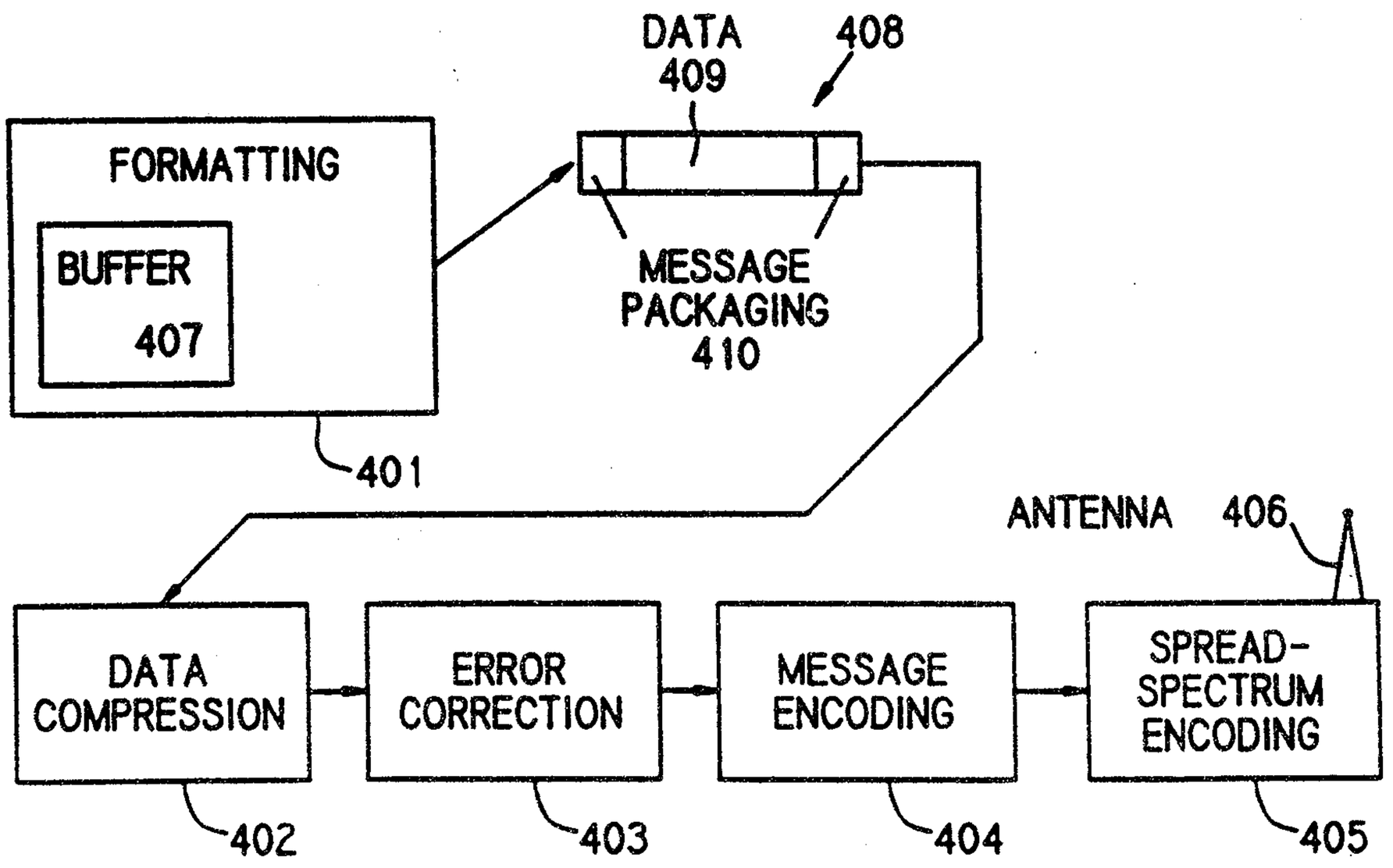

FIG. 4.