

Description

The present invention relates in general to an intermittently driven transmitter and more particularly to one which radiates high transmission power.

A signal transmission system for transmitting a signal through a satellite, for example, is known comprising a signal transmission system having short duration and high transmission power in which a frequency of 1.6GHz is used and data is transmitted during a 100 ms period with a transmission power of 40W.

A satellite communication transmitter is known wherein a power amplifying stage or circuit connected to an antenna operates in class "C" mode so as to obtain high power efficiency and has a power supply having a large capacity and in which a voltage of, for example, 30 volts and a current of about 5 amperes is required to drive the power amplifying circuit. In general, when such a conventional transmitter is driven, a power source voltage supplied to the transmitter is boosted by using a DC-DC converter having a large capacity and a power of 30 volts and 5 amperes which in the above-mentioned example is directly supplied to the power amplifying circuit.

Thus, in the prior art transmitter described above, a power supply having a large capacity with about 30 volts and 5 amperes is required to drive the power amplifying circuit. Also, a DC-DC converter having a large capacity is required when the power amplifier circuit is driven by the battery.

A DC-DC converter having a small capacity may be used to charge a capacitor from the battery so as to drive the amplifying circuit, but such drive method has the following defects. When the power amplifying circuit is directly driven by the voltage stored in the capacitor, the voltage drops very rapidly upon operation of the transmitter so that the output power of the power amplifying circuit is difficult to maintain and the power efficiency is low.

Accordingly, it is an object of this invention to provide an intermittent transmitter which can remove the defects inherent in prior art transmitters.

According to one aspect of the present invention, there is provided an intermittent transmitter for intermittently transmitting a signal comprising a transmission signal forming circuit for forming a signal which is to be transmitted; a power amplifying circuit for amplifying said transmission signal formed by said transmission signal forming circuit; a power source voltage supply, a boosting circuit for boosting the power source voltage from said power source voltage supply which is to be supplied to said intermittent transmitter; a reactive electrical energy storage element arranged to re-

ceive an output from said boosting circuit; and a constant voltage circuit connected to said element to receive the electrical energy stored therein and operative to generate a constant voltage output which is higher than said power source voltage, wherein said constant voltage output from said constant voltage circuit is, in use, supplied to said power amplifying circuit as a power source to intermittently drive said power amplifying circuit.

Preferably, said electrical energy storage element is a capacitor which in use is charged by the boosted output voltage from the booster circuit.

As will become apparent from the following description, the invention can provide an intermittent transmitter of novel construction in which a power amplifying circuit is driven with a booster circuit such as a DC-DC converter having a small capacity and a capacitor and can provide stable operating characteristics and which reduces power losses occurring in a power supply path through which the power is supplied to the power amplifying circuit. In the illustrated intermittent transmitter, the transmission signal forming circuit supplies a transmission signal to a power amplifying circuit and these circuits can be easily and simply connected.

The present invention will be further explained hereinafter with reference to the following description of exemplary embodiments and the accompanying drawings, in which:

FIG. 1 is a block diagram illustrating an overall circuit arrangement of an embodiment of an intermittent transmitter according to the present invention;

FIG. 2 is a circuit diagram illustrating an example of the power amplifying circuit in the transmitter of the invention; and

FIG. 3 is a plot of the charging voltage to a capacitor which illustrates how it changes with time in the transmitter of the present invention.

FIG. 1 illustrates an intermittent transmitter according to the present invention. The present invention in this particular embodiment is applied to a mobile type high power transmission transmitter for use in a mobile ground station in a satellite communication system. Such a satellite communication system may comprise base stations, mobile units, and satellites for duplex transmission between the two. The base station transmits an interrogation signal to a mobile unit via two or three stationary satellites. Then, the mobile unit receives the interrogation signals and calculates self-position data on the basis of transmission time lag of the signals. The self-position data is transmitted to the base station, instead. The illustrated embodiment relates to the mobile unit, in particular its transmitter portion.

As shown in FIG. 1, the intermittent transmitter

of the invention comprises a transmission signal forming circuit 10 for forming the transmission signal and a power amplifying circuit 30 for amplifying and supplying the transmission signal supplied from the transmission signal forming circuit 10 through a coaxial cable 25 used as a signal transmission line to an antenna 40. A power supply 50 for the transmitter is connected as illustrated. The power amplifying circuit 30 may be installed, for example, on the roof of a mobile unit.

In this embodiment, the transmission signal forming circuit 10 connects to a keyboard apparatus 1 so as to input transmission data and control data to the transmitter and a display apparatus 2 is connected so as to indicate various kinds of data and other information. The transmission signal forming circuit 10 comprises a controller 11 for controlling the input and output data and is connected to a modulator 12 which modulates data to be transmitted from the controller 11 to a signal which is modulated in a predetermined modulation manner. A carrier oscillator 13 which generates a carrier having a frequency of, for example, 1.6GHz supplies an input to a mixer 14 which also receives the output of the modulator 12 and superimposes the modulating signal on the carrier. An amplifier 15 receives the output of the mixer 14 and amplifies the transmission signal. The output terminal of the amplifier 15 is connected through a capacitor 23 which is used for blocking DC signals to one end of a coaxial cable 25. This one end of the coaxial cable is connected through a choke coil 24 to the output terminal of a boosting circuit 53 which may be formed as a "DC-DC converter" in the power supply 50. The power amplifying circuit 30 is formed of a power amplifier 31 which operates as a class "C" amplifier. The input terminal of the power amplifier 31 is connected through a capacitor 27 which blocks DC signals supplied from the DC-DC converter to the second end of the coaxial cable 25. The output terminal of the power amplifier 31 is connected to the transmitting antenna 40. The output end of the coaxial cable 25 is grounded through a series circuit comprising a choke coil 29 which is used to block the transmission signal and a capacitor 70 which is used to drive the power amplifying circuit 30. The junction between the choke coil 29 and the capacitor 70 is connected through a constant voltage circuit 75 to the power amplifier 31 in the power amplifying circuit 30. The capacitor 27 and the choke coil 29 comprise a signal separator for separating signals.

The power amplifier 31 of the power amplifying circuit 30 is illustrated in FIG. 2 and comprises a two-stage amplifying circuit comprising grounded base type transistors 33 and 34 which have their bases grounded. The output terminal of the power amplifier 31 is connected through a bandpass filter

(BPF) 35 which depresses undesired radiation to the transmitting antenna 40. A matching circuit may be provided but is not shown in FIG. 2.

FIG. 1 illustrates the power supply 50 which comprises a mobile type battery power source 51 of, for example, 13.8 volts and a power supply 52 which is supplied with the output voltage of the battery power source 51. A DC-DC converter 53 comprises the boosting circuit. The power supply 52 has its output terminal connected to various circuit elements forming the previously mentioned transmission signal forming circuit 10 and provides a relatively low drive voltage from the output voltage of the battery power source 51 for driving the various elements of the transmission signal forming circuit 10. The DC-DC converter 53 increases the output voltage of the battery power source 51 to, for example, about 60 volts. The DC-DC converter 53 has its output terminal connected to the choke coil 24 and to a non-inverting input terminal of a comparator 60 so as to supply a charging current to the capacitor 70 for driving the power amplifying circuit 30 through the coaxial cable 25. The constant voltage circuit 75 has its input terminal connected to the capacitor 70. The constant voltage circuit 75 comprises a transistor 76 with its collector connected to the junction point between the capacitor 70 and the coil 29 and a Zener diode 77 is connected between ground and the base of the transistor 76. The constant voltage circuit 75 forms a drive voltage V_{dr} of about 30 volts, for example, from the voltage appearing on the capacitor 70 and drives the power amplifier 31 as illustrated in FIG. 1.

The comparator 60 detects when the output voltage of the DC-DC converter which is the voltage V_c to which the capacitor 70 has been charged has been boosted to a level higher than a predetermined voltage as, for example, 50 volts. The comparator 60 supplies the detected signal to the controller 11 in the transmission signal forming circuit 10 and the reference voltage V_{ref} is supplied to the inverting input terminal of the comparator 60 from a battery as shown.

When the signal detected by the comparator 60 is supplied to the controller 11 of the transmission signal forming circuit 10, the controller 11 supplies transmission data of a predetermined length of stored data to the modulator 12 after a predetermined period T_o as illustrated in FIG. 3 and transmits the transmission signal from the mixing circuit 14 through the amplifier 15. The power amplifier 31 in the power amplifying circuit 30 is supplied with the transmission signal from the transmission forming circuit 10 through the coaxial cable 25, but it does not operate when it is not supplied with the input signal, but accomplishes class "C" operation only when the transmission

signal from the transmission signal forming circuit 10 is supplied to it at which time it transmits the transmission signal via the transmitting antenna 40.

In this embodiment, the capacitor 70 which supplies the drive power to the power amplifier 31 in the power amplifying circuit 30 is gradually charged by the DC-DC converter as shown in FIG. 3. The comparator 60 detects when the voltage V_c on the capacitor 70 has been boosted to a level higher than the predetermined voltage. As shown in FIG. 3, during a predetermined period T_c from a time t_b with a delay of a predetermined period T_o from a time t_a , the transmission data is supplied from the transmission signal forming circuit 10 to the power amplifying circuit 30 and thus the power amplifier 31 is operated. As a result, the voltage V_c produced by the charge on the capacitor 70 drops. When the transmission signal forming circuit 10 discontinues supplying the transmission signal to the power amplifying circuit 30, the power amplifying circuit 30 stops operation and the capacitor 70 will again be charged and the described operation is repeated each time transmission is to occur.

The time durations of the predetermined period T_o and T_c are respectively selected to be in a range such that when the power amplifier 31 operates, the voltage V_c to which the capacitor 70 is charged will be prevented from dropping lower than the operating voltage of the constant voltage circuit 75, that is the voltage at which the constant voltage circuit 75 can generate the constant voltage V_{dr} .

When the power amplifier 31 which operates in class "C" is replaced with a power amplifier which operates in class "AB", it is necessary to provide in the power source line a switching circuit which interrupts the supply of drive current to such power amplifier so that no input signal is supplied to it at certain times.

According to the illustrated embodiment, the intermittent transmitter comprises the boosting circuit so as to boost the power source voltage supplied to the transmitter to a predetermined voltage level, and the capacitor which is charged by the boosted voltage from the boosting circuit and the constant voltage circuit which is supplied with the charging current of the capacitor whereby the constant voltage circuit supplies a voltage with a constant potential higher than the voltage supplied to the transmitter amplifying circuit so as to intermittently drive the transmitter. In other words, the voltage for driving the output amplifying circuit is made a constant voltage from the voltage supplied from the capacitor 70 by the constant voltage circuit and the intermittent transmitter as illustrated will provide a stable transmitter output.

Also, in the embodiment, the transmission signal forming circuit for forming the transmission

supplied to the power amplifying circuit and the power amplifying circuit are separated by the transmission line 25 which may be a coaxial cable and the voltage resulting from boosting the voltage supplied to the transmitter is superimposed upon the transmission signal and then fed to the power amplifying circuit. Then the constant voltage is formed by the constant voltage circuit which is connected to the power amplifying circuit which is driven by the constant voltage. Thus, the current flowing through the transmission line comprising coaxial cable in FIG. 1 that connects the transmission signal forming circuit and the power amplifying circuit can be reduced because of the boosted voltage and, thus, power loss (Joule Loss) in the transmission line will be reduced for a given supply voltage of the battery power source 51.

Also, since the capacitor 70 is provided at the site of the power amplifying circuit for the transmission signal forming circuit allows the length of path through which a large current flows when the signal is transmitted to be minimized. Thus, the power loss will be reduced due to this fact.

Claims

1. An intermittent transmitter for intermittently transmitting a signal, the transmitter comprising a transmission signal forming circuit (10) for forming a signal which is to be transmitted; a power amplifying circuit (31) for amplifying said transmission signal formed by said transmission signal forming circuit (10); a power source voltage supply (51), a boosting circuit (53) for boosting the power source voltage from said power source voltage supply (51) which is to be supplied to said intermittent transmitter; characterised in that it further comprises: a reactive electrical energy storage element (70) arranged to receive an output from said boosting circuit (53); and a constant voltage circuit (75) connected to said element (70) to receive the electrical energy stored therein and operative to generate a constant voltage output which is higher than said power source voltage, wherein said constant voltage output from said constant voltage circuit (75) is, in use, supplied to said power amplifying circuit (31) as a power source to intermittently drive said power amplifying circuit (31).
2. A transmitter according to claim 1, further comprising a comparator (60) for receiving and comparing the voltage from said boosting circuit (53) with a predetermined reference voltage (V_{ref}) and for supplying an output signal to said transmission signal forming circuit (10).



signal from the transmission signal forming circuit 10 is supplied to it at which time it transmits the transmission signal via the transmitting antenna 40.

In this embodiment, the capacitor 70 which supplies the drive power to the power amplifier 31 in the power amplifying circuit 30 is gradually charged by the DC-DC converter as shown in FIG. 3. The comparator 60 detects when the voltage V_c on the capacitor 70 has been boosted to a level higher than the predetermined voltage. As shown in FIG. 3, during a predetermined period T_c from a time t_b with a delay of a predetermined period T_o from a time t_a , the transmission data is supplied from the transmission signal forming circuit 10 to the power amplifying circuit 30 and thus the power amplifier 31 is operated. As a result, the voltage V_c produced by the charge on the capacitor 70 drops. When the transmission signal forming circuit 10 discontinues supplying the transmission signal to the power amplifying circuit 30, the power amplifying circuit 30 stops operation and the capacitor 70 will again be charged and the described operation is repeated each time transmission is to occur.

The time durations of the predetermined period T_o and T_c are respectively selected to be in a range such that when the power amplifier 31 operates, the voltage V_c to which the capacitor 70 is charged will be prevented from dropping lower than the operating voltage of the constant voltage circuit 75, that is the voltage at which the constant voltage circuit 75 can generate the constant voltage V_{dr} .

When the power amplifier 31 which operates in class "C" is replaced with a power amplifier which operates in class "AB", it is necessary to provide in the power source line a switching circuit which interrupts the supply of drive current to such power amplifier so that no input signal is supplied to it at certain times.

According to the illustrated embodiment, the intermittent transmitter comprises the boosting circuit so as to boost the power source voltage supplied to the transmitter to a predetermined voltage level, and the capacitor which is charged by the boosted voltage from the boosting circuit and the constant voltage circuit which is supplied with the charging current of the capacitor whereby the constant voltage circuit supplies a voltage with a constant potential higher than the voltage supplied to the transmitter amplifying circuit so as to intermittently drive the transmitter. In other words, the voltage for driving the output amplifying circuit is made a constant voltage from the voltage supplied from the capacitor 70 by the constant voltage circuit and the intermittent transmitter as illustrated will provide a stable transmitter output.

Also, in the embodiment, the transmission signal forming circuit for forming the transmission

supplied to the power amplifying circuit and the power amplifying circuit are separated by the transmission line 25 which may be a coaxial cable and the voltage resulting from boosting the voltage supplied to the transmitter is superimposed upon the transmission signal and then fed to the power amplifying circuit. Then the constant voltage is formed by the constant voltage circuit which is connected to the power amplifying circuit which is driven by the constant voltage. Thus, the current flowing through the transmission line comprising coaxial cable in FIG. 1 that connects the transmission signal forming circuit and the power amplifying circuit can be reduced because of the boosted voltage and, thus, power loss (Joule Loss) in the transmission line will be reduced for a given supply voltage of the battery power source 51.

Also, since the capacitor 70 is provided at the site of the power amplifying circuit for the transmission signal forming circuit allows the length of path through which a large current flows when the signal is transmitted to be minimized. Thus, the power loss will be reduced due to this fact.

Claims

1. An intermittent transmitter for intermittently transmitting a signal, the transmitter comprising a transmission signal forming circuit (10) for forming a signal which is to be transmitted; a power amplifying circuit (31) for amplifying said transmission signal formed by said transmission signal forming circuit (10); a power source voltage supply (51), a boosting circuit (53) for boosting the power source voltage from said power source voltage supply (51) which is to be supplied to said intermittent transmitter; characterised in that it further comprises: a reactive electrical energy storage element (70) arranged to receive an output from said boosting circuit (53); and a constant voltage circuit (75) connected to said element (70) to receive the electrical energy stored therein and operative to generate a constant voltage output which is higher than said power source voltage, wherein said constant voltage output from said constant voltage circuit (75) is, in use, supplied to said power amplifying circuit (31) as a power source to intermittently drive said power amplifying circuit (31).
2. A transmitter according to claim 1, further comprising a comparator (60) for receiving and comparing the voltage from said boosting circuit (53) with a predetermined reference voltage (V_{ref}) and for supplying an output signal to said transmission signal forming circuit (10).



3. A transmitter according to claim 1 or 2, further comprising a signal cable (25), wherein said power amplifying circuit (31) receives the transmission signal formed by said transmission signal forming circuit (10) through said signal cable (25) and said reactive electrical energy storage element (70) receives the output from said boosting circuit (53) through said signal cable (25).
4. An intermittent transmitter according to claim 3, in which the transmission signal from said transmission signal forming circuit (10) and the voltage boosted by said boosting circuit (53) are superimposed and supplied to said signal cable (25).
5. An intermittent transmitter according to claim 4, further comprising a signal separator (27, 29) for separating the signal supplied thereto through said signal cable (25) into a signal which is to be supplied to said power amplifying circuit (31) and a signal which is to be supplied to said element (70).
6. An intermittent transmitter according to any one of claims 3 to 5, further comprising a comparator (60) for comparing the voltage from said boosting circuit (53) with a predetermined reference voltage (V_{ref}), and for supplying an output signal to said transmission signal forming circuit (11).
7. A transmitter according to claim 2 or 6 wherein the transmission signal forming circuit (10) is operative to supply a signal to be transmitted to said power amplifying circuit (31) when the output signal from the comparator indicates that sufficient energy is stored in said reactive element (70) to power the transmission of the signal.
8. A transmitter as claimed in any one of the preceding claims and in which, in use, said power amplifying circuit (31) is driven in the class "C" operation mode.
9. A transmitter according to any one of the preceding claims wherein said electrical energy storage element (70) is a capacitor which in use is charged by the boosted output voltage from the boosted circuit (53).

Patentansprüche

1. Intermittierend betriebener Sender zum intermittierenden Aussenden eines Signals mit einer Sendesignal-Aufbereitungsschal-

tung (10) zur Aufbereitung eines zu sendenden Signals,

mit einer Leistungsverstärkerschaltung (31) zum Verstärken des von der Sendesignal-Aufbereitungsschaltung (10) aufbereiteten Sendesignals,

mit einer Spannungsversorgungsquelle (51)

und mit einer Spannungserhöhungsschaltung (53) zur Erhöhung der aus der Spannungsversorgungsquelle (51) kommenden Versorgungsspannung zur Speisung des intermittierend betriebenen Senders,

gekennzeichnet durch

ein von einer Reaktanz gebildetes elektrisches Energiespeicherelement (70), das so angeordnet ist, daß es die Ausgangsspannung der Spannungserhöhungsschaltung (53) aufnimmt, und

eine Konstantspannungsschaltung (75), die mit dem Energiespeicherelement (70) so verbunden ist, daß es die in diesem gespeicherte elektronische Energie aufnimmt und im Betrieb eine konstante Ausgangsspannung erzeugt, die höher ist als die Spannung der Spannungsversorgungsquelle.

wobei die konstante Ausgangsspannung der Konstantspannungsschaltung (75) im Betrieb der Leistungsverstärkerschaltung (31) als Versorgungsspannung zugeführt wird, um diese intermittierend zu betreiben.

2. Sender nach Anspruch 1, der einen Komparator (60) aufweist, der die aus der Spannungserhöhungsschaltung (53) kommende Spannung aufnimmt, mit einer vorbestimmten Referenzspannung (V_{ref}) vergleicht und der Sendesignal-Aufbereitungsschaltung (10) ein Ausgangssignal zuführt.

3. Sender nach Anspruch 1 oder 2, der eine Signalleitung (25) aufweist, über die die Leistungsverstärkerschaltung (31) das von der Sendesignal-Aufbereitungsschaltung (10) aufbereitete Sendesignal aufnimmt, und über die das von einer Reaktanz gebildete Energiespeicherelement (70) das Ausgangssignal der Spannungserhöhungsschaltung (53) aufnimmt.

4. Intermittierend betriebener Sender nach Anspruch 3, bei dem das Sendesignal aus der Sendesignal-Aufbereitungsschaltung (10) und die von der Spannungserhöhungsschaltung (53) erhöhte Spannung einander überlagert und der Signalleitung (25) zugeführt werden.

5. Intermittierend betriebener Sender nach Anspruch 4, bei dem eine Signaltrenneinrichtung



(27, 29) vorgesehen ist zur Auftrennung des ihr über die Signalleitung (25) zugeführten Signals in ein der Leistungsverstärkerschaltung (31) zuzuführendes Signal und ein dem genannten Element (70) zuzuführendes Signal.

5

6. Intermittierend betriebener Sender nach einem der Ansprüche 3 bis 5, der einen Komparator (60) aufweist, der die aus der Spannungserhöhungsschaltung (53) kommende Spannung mit einer vorbestimmten Referenzspannung (V_{ref}) vergleicht und dessen Ausgangssignal der Sendesignal-Aufbereitungsschaltung (10) zugeführt wird.

10

7. Sender nach Anspruch 2 oder 6, bei dem die Sendesignal-Aufbereitungsschaltung (10) der Leistungsverstärkerschaltung (31) ein zu sendendes Signal zuführt, wenn das Ausgangssignal des Komparators anzeigt, daß in dem von einer Reaktanz gebildeten Element (70) genügend viel Energie gespeichert ist, um die Aussendung des Signals zu speisen.

15

8. Sender nach einem der vorhergehenden Ansprüche, bei dem die Leistungsverstärkerschaltung (31) während des Betriebs im C-Betrieb arbeitet.

20

9. Sender nach einem der vorhergehenden Ansprüche, bei dem das elektrische Energiespeicherelement (70) ein Kondensator ist, der im Betrieb an der in der Spannungserhöhungsschaltung (53) erhöhten Spannung aufgeladen wird.

25

30

35

Revendications

Transmetteur intermittent pour transmettre par intermittence un signal, le transmetteur comprenant un circuit de formation de signal de transmission (10) pour former un signal qui doit être transmis ; un circuit d'amplification de puissance (31) pour amplifier ledit signal de transmission formé par ledit circuit de formation de signal de transmission (10) ; une alimentation en tension de source de puissance (51), un circuit de suramplification (53) pour suramplifier la tension de source de puissance en provenance de ladite alimentation en tension de source de puissance (51) qui doit être appliquée audit transmetteur intermittent ; caractérisé en ce qu'il comprend en outre : un élément de stockage d'énergie électrique réactif (70) agencé pour recevoir une sortie en provenance dudit circuit de suramplification (53) ; et un circuit de tension constante (75) qui est connecté audit élément (70) pour rece-

40

45

50

55

voir l'énergie électrique stockée dedans et qui fonctionne pour générer une sortie de tension constante qui est supérieure à ladite tension de source de puissance, dans lequel ladite sortie de tension constante en provenance dudit circuit de tension constante (75) est, en fonctionnement, appliquée audit circuit d'amplification de puissance (31) en tant que source de puissance pour exciter par intermittence ledit circuit d'amplification de puissance (31).

2. Transmetteur selon la revendication 1, comprenant en outre un comparateur (60) destiné à recevoir la tension en provenance du circuit de suramplification (53) et à la comparer à une tension de référence prédéterminée (V_{ref}), et à appliquer un signal de sortie audit circuit de formation de signal de transmission (10).

3. Transmetteur selon la revendication 1 ou 2, comprenant en outre un câble de signal (25), dans lequel ledit circuit d'amplification de puissance (31) reçoit le signal de transmission formé par ledit circuit de formation de signal de transmission (10) par l'intermédiaire dudit câble de signal (25) et ledit élément de stockage d'énergie électrique réactif (70) reçoit la sortie en provenance dudit circuit de suramplification (53) par l'intermédiaire dudit câble de signal (25).

4. Transmetteur intermittent selon la revendication 3, dans lequel le signal de transmission en provenance dudit circuit de formation de signal de transmission (10) et la tension suramplifiée par ledit circuit de suramplification (53) sont superposés et appliqués audit câble de signal (25).

5. Transmetteur intermittent selon la revendication 4, comprenant en outre un séparateur de signal (27, 29) pour séparer le signal qui lui est appliqué par l'intermédiaire dudit câble de signal (25) en un signal qui doit être appliqué audit circuit d'amplification de puissance (31) et en un signal qui doit être appliqué audit élément (70).

6. Transmetteur intermittent selon l'une quelconque des revendications 3 à 5, comprenant en outre un comparateur (60) destiné à comparer la tension en provenance dudit circuit de suramplification (53) à une tension de référence prédéterminée (V_{ref}) et à appliquer un signal de sortie audit circuit de formation de signal de transmission (10).

7. Transmetteur selon la revendication 2 ou 6,



dans lequel le circuit de formation de signal de transmission (10) fonctionne pour appliquer un signal qui doit être transmis sur ledit circuit d'amplification de puissance (31) lorsque le signal de sortie en provenance du comparateur indique qu'une énergie suffisante est stockée dans ledit élément réactif (70) pour permettre la transmission du signal.

5

8. Transmetteur selon l'une quelconque des revendications précédentes dans lequel, en fonctionnement, ledit circuit d'amplification de puissance (31) est excité dans le mode de fonctionnement de classe "C".

10

9. Transmetteur selon l'une quelconque des revendications précédentes, dans lequel ledit élément de stockage d'énergie électrique (70) est une capacité qui, en fonctionnement, est chargée par la tension de sortie suramplifiée en provenance du circuit suramplificateur (53).

15

20

25

30

35

40

45

50

55

7