CIRCUIT DESCRIPTION AND DIGITAL SECURITY CODE INFORMATION

Equipment Description

file: uc-218B

The model SPP-900 is a telephone terminal device that is designed for voice operation in a similar fashion to an ordinary residential or business telephone without the inconvenience and restrain of a handset cord.

This device consists of a base unit and a handset. The base unit is connected to a standard telephone modular jack (USOC RJ 11C Type) and is supplied electric power from a standard AC power line by using with the AC Adapter. The handset is powered from an internal battery pack.

The SPP-900 Cordless Telephone operates by means of a full duplex radio frequency TX/RX system in 902 - 928 MHz band. These radio frequency systems operate in accordance with Part 15 of the FCC Rules.

The SPP-900 has been specifically designed to comply with the requirements set forth in Part 68 of the FCC Rules as well as the Part 15 requirements.

Circuit Description and Operating Frequency

Overview

This equipment is a Cordless Telephone System which operates within the 900MHz ISM band. This equipment consists of a base unit and a handset. The base unit is connected to a telephone network, and has transmitter and receiver circuits which are served to communication with the handset. The handset also has a transmitter and receiver portions in addition to regular dialing circuit.

Both the handset and the base unit have PLL circuits which enable to communicate in an empty channel. Pressing the CH key on the handset can last the communications moving into other open channel without cutting the line even if interfered by interruption on talks.

1. Handset

1) Local Frequencies and Intermediate Frequencies

TX VCO Frequency: 902.052464 MHz to 904.002470 MHz
RX 1st Local Freq.: 936.552559 MHz to 938.502564 MHz
RX VCO Frequency: 936.552559 MHz to 938.502564 MHz

RX 2nd Local Freq.: 10.100 MHz

1st Intermediate Frequency: 10.555 MHz
2nd Intermediate Frequency: 455 kHz

2) Communication Link to Base unit

RX Circuit:

An incoming RF signal from the base unit is received through the antenna. RX VCO frequency shown above is produced by PLL IC (IC502) and RX VCO (IC502 1/2). Then, this frequency is the RX 1st Local frequency.

This 1st local signal is applied to the 1st Mixer (IC502) which produces 1st IF of 10.555MHz.

The 1st IF signal (10.555MHz) is mixed with 2nd local frequency of 10.1MHz to produce the 2nd IF of 455kHz at IC401. AF signal demodulated by IC401 is amplified by the audio amplifier (Q401/Q403/Q405/Q406) to drive a speaker.

TX Circuit:

TX VCO signal is generated at the PLL circuit and the TX VCO (IC502 2/2). Meanwhile, voice signal from the microphone (MC401) modulates the TX VCO signal at IC502. This modulated signal is the TX RF frequencies as listed above.

Then, the TX RF signal is amplified by RF AMP (Q506/Q507) and fed into the antenna through a band pass filter (FT501).

3) Dialing Signal

When this equipment is in Talk Mode, the transmitting circuit and dialing circuit are activated to make outgoing call. In this condition, when any number keys are pressed, the CPU (IC404) generates corresponding dial pulse codes.

2. Base Unit

1) Local Frequencies and Intermediate Frequencies

TX VCO Frequency : 925.997470 MHz to 927.947465 MHz
RX 1st Local Freq.: 891.497564 MHz to 893.447559 MHz
RX VCO Frequency : 891.497564 MHz to 893.447559 MHz
RX 2nd Local Freq.: 10.100MHz

1st Intermediate Frequency: 10.555 MHz
2nd Intermediate Frequency: 455 kHz

2) Communication Link to Handset

RX Circuit:

An incoming RF signal from the handset is received through the antenna.

RX VCO frequency shown above is produced by PLL IC (IC202) and RX VCO (IC202 1/2). Then, this frequency is the RX 1st Local frequency. This 1st local signal is applied to the 1st Mixer (IC202) which produces 1st IF of 10.555MHz.

Then, the 1st IF signal (10.555MHz) is mixed with 2nd local frequency of 10.100MHz to produce the 2nd IF of 455kHz at IC3, and also AF output is obtained by IC3. The demodulated signal by IC3 contains a security code, and the code is fed to the CPU.

TX Circuit:

TX VCO signal is generated at the PLL circuit and the TX VCO (IC202 2/2). Meanwhile, voice signal from Telephone Network through the Hybrid Transformer (T1) modulates the TX VCO signal at IC202. This modulated signal is the TX RF frequencies as listed above. Then, the TX RF signal is amplified by RF AMP (Q206/Q207) and fed into the antenna through a band pass filter (FT201).

3) Dialing Signal

Dial pulse code sent from the handset is demodulated by IC3 as mentioned above, and is fed into the CPU to control RL1.

4) Telephone Interface Circuit

Outgoing voice signal to telephone network is amplified by IC1 and Q3. This signal is delivered to the telephone interface circuit through the Hybrid Transformer (T1).

Incoming voice signal also goes through T1, then it is amplified by Q4 and IC1 2/2 to a proper level for frequency modulation, then it is fed to the TX circuit. To protect the TX/RX circuits from a metallic surge, the surge absorbing capacitor (C20) is provided at the secondary circuit of the Hybrid Transformer (T1).

5) Bell Signal

An alerting signal (Bell signal) is detected by means of a Photo Coupler (IC4) which has a sufficiently high impedance.

6) Power Supply Circuit

The power supply circuits are composed of Q7, Q11 and a zener diode type D11 and D13. These are voltage regulator circuits to stabilize input voltage from the AC Adapter to attain a stable operation.

Digital Security Code Information

65536 Digital Security Code

This cordless telephone system automatically selects a different security code from 65536 possible discrete digital codes each time the cordless telephone is used.

Furthermore, the security code can be changed randomly by pressing PAGE button on the base unit when the handset is placed in the base unit.

[APPENDIX] TEST MODE AND OPERATION FREQUENCY

TEST MODE

This cordless telephone has test mode function which enable to perform TX/RX testing.

Test Mode for Base Unit

To enter the test mode, connect the AC Adapter to the unit while pressing the PAGE button. When test mode is set up, and the LINE LED lights. The unit is set for CH 19 (926.897468MHz) Transmitting mode.

To change the transmitting frequency, change the TONE/PULSE switch position to TONE side and them press the PAGE button during the unit is set the TX Test mode, so that the channel is changed from CH 19 to CH 20. Every pressing the CHANNEL key, channel is changed as below.

19 20 21 40 1 2 3 - - - 39 40 1 2 3 4 ---

To cancel the test mode, place the Handset in the Base Unit, so that the STATUS LED lights and the equipment is set for normal operation mode (Standby mode).

Or, disconnect the AC Adapter and connect it again, so that the test mode is easily canceled.

Test Mode for Handset

First, disconnect the battery pack. Then, connect the battery pack again while pressing # and * keys. When test mode is set up, long beep tone is heard and the TALK LED lights. The unit is set for CH 21 Transmitting mode. Every pressing the CHANNEL key, channel is changed as below.

21 20 19 40 1 2 3 - - - 39 40 1 2 3 4 ---

To cancel the test mode, press the TALK key.

FREQUENCY TABLE

CH	Portable(TX Frequency)	Base(TX Frequency)
1	902.052464MHz	925.997470MHz
2	902.102465MHz	926.047470MHz
3	902.152465MHz	926.097470MHz
4	902.202465MHz	926.147470MHz
5	902.252465MHz	926.197470MHz
6	902.302465MHz	926.247469MHz
7	902.352465MHz	926.297469MHz
8	902.402465MHz	926.347469MHz
9	902.452465MHz	926.397469MHz
10	902.502466MHz	926.447469MHz
11	902.552466MHz	926.497469MHz
12	902.602466MHz	926.547469MHz
13	902.652466MHz	926.597469MHz
14	902.702466MHz	926.647468MHz
15	902.752466MHz	926.697468MHz
16	902.802466MHz	926.747468MHz
17	902.852467MHz	926.797468MHz
18	902.902467MHz	926.847468MHz
19	902.952467MHz	926.897468MHz
20	903.002467MHz	926.947468MHz
21	903.052467MHz	926.997467MHz
22	903.102467MHz	927.047467MHz
23	903.152467MHz	927.097467MHz
24	903.202468MHz	927.147467MHz
25	903.252468MHz	927.197467MHz
26	903.302468MHz	927.247467MHz
27	903.352468MHz	927.297467MHz
28	903.402468MHz	927.347466MHz
29	903.452468MHz	927.397466MHz
30	903.502468MHz	927.447466MHz
31	903.552468MHz	927.497466MHz
32	903.602469MHz	927.547466MHz
33	903.652469MHz	927.597466MHz
34	903.702469MHz	927.647466MHz
35	903.752469MHz	927.697466MHz
36	903.802469MHz	927.747465MHz
37	903.852469MHz	927.797465MHz
38	903.902469MHz	927.847465MHz
39	903.952470MHz	927.897465MHz
40	904.002470MHz	927.947465MHz