

1. GENERAL TECHNICAL DESCRIPTION

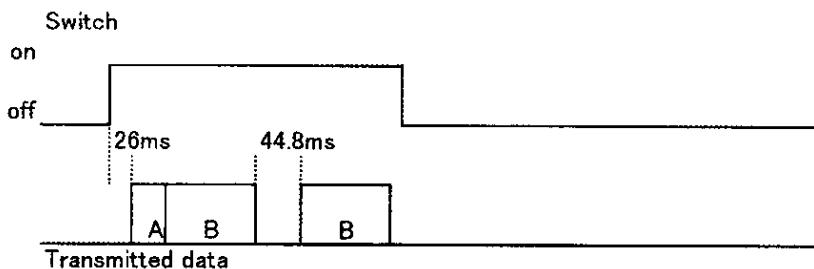
1-1 INTENDED USE AND OPERATION INSTRUCTIONS

This equipment constitutes a key-less entry system in combination with a control unit with a receiver which is being simultaneously submitted to Federal Communications Commission for notification, as identified with FCC identifier, KBRGSTU11.

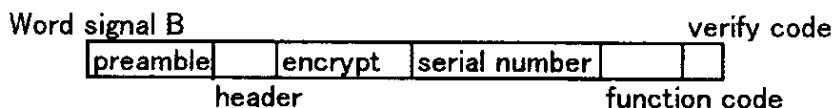
This system is a radio frequency apparatus which distantly controls the locking and unlocking of motor vehicle door locks, unlock trunk lid and in case of emergency, sounding horn by operating a transmitter with four control buttons (four push button switches). The transmitter is a portable device incorporated in a key holder and the control unit including the receiver with a integral receiving antenna is a mobile device installed on the cross member of the instrument panel of the motor vehicle. The basic construction of the system is shown in Section 1-2. System Construction.

By loading a battery cell into the transmitter, then;

1. To press one of four buttons, "LOCK" or "UNLOCK" button for at least 13 milliseconds, the transmitter, about after 26 milliseconds, radiates A+B+B coded signal to be received by the control unit installed in the vehicle to corresponding vehicle parts actuated, where A is a wake up signal and B is a word signal (see Timing Diagram below). Regarding "TRUNK" and "PANIC" button, it is required to actuate corresponding function on the vehicle, to press continuously at least 1.5 seconds. To press any buttons continuously up to 25 seconds, the transmitter continuously send word signal B.



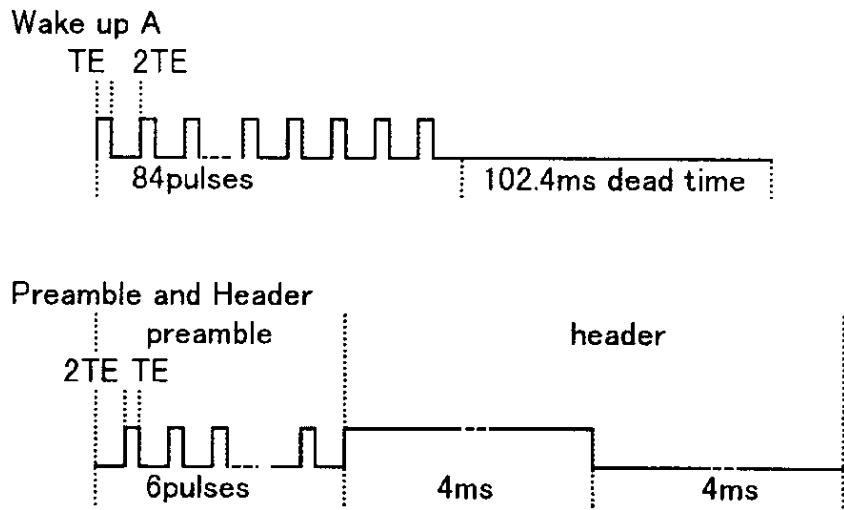
2. The word signal B is consisted by six portions, which are preamble(a), header(b), encrypt(c), serial number(d), function code(e) and verify code(f).



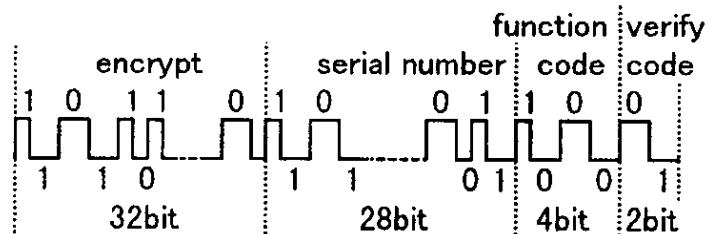
3. The signals of wake up A and preamble(a) are consisted by a element pulse of on time 400 microseconds (TE) and off time 800 microsecond (2TE), duty 1/3 pulse. The wake up signal A is consisted by 84 element pulses and a 102.4 milliseconds dead time. The preamble(a) is

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consisted by 7 element pulses. The header(b) is consisted by a 4 milliseconds on and 4 milliseconds off long pulse.



4. The encrypt(c) is 32 bit, the serial number(d) is 28 bit, function code(e) is 4 bit and verify code(f) is 2 bit pulses are used, where data 1 bit is consisted by one single high or low signal, for example, TE high or 2TE low means "1", 2TE high or TE low means "0".



5. To press of one of "LOCK", "UNLOCK", "TRUNK" or "PANIC" buttons as mentioned 1., the transmitter transmits all same signal except function code(e). The button function is characterized by the function code(e), which is unique for each buttons.
6. To press "UNLOCK" button once, the driver door of the vehicle is unlocked, to press twice within 1.5 seconds, all doors unlocked.
7. To press any button for longer period, the transmit of word cord B will be continued but will cease it within 25 seconds.
8. Regarding "PANIC" button, it makes sound the alarm and the head lights of the vehicle for approximately 30 seconds, During sound alarm period, to press "PANIC" button again it stops.

9. To press the “LOCK” and “UNLOCK” buttons simultaneously at least 2 seconds, it switches one mode which deactivate the horn chirp and the hazard flashing as the indicator on locking, and other mode which activate them.

The transmitter and receiver communication is made on frequency $f = 315$ MHz, and the modulation is AM, corresponding to binary digit 0 and 1.

1-2 SYSTEM CONSTRUCTION

The construction of the system is shown below:

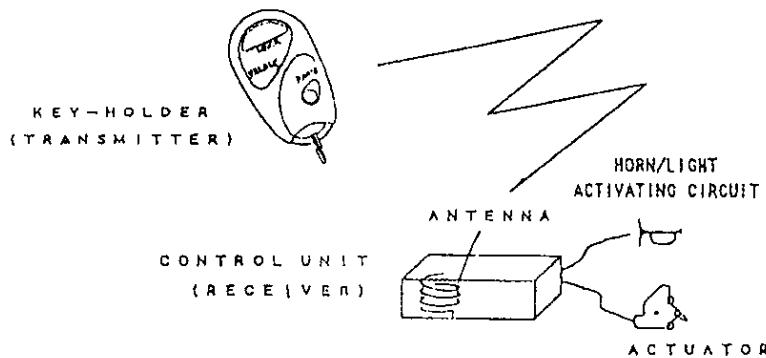


Figure 1-1 : System construction

1-3 TIMING DIAGRAM

The timing diagrams of the system are already shown in Section 1-1.

1-4 APPLIED REGULATIONS

This equipment will be operated under FCC Rules and Regulations Part 15.

1-5 TRANSITION PROVISIONS

This equipment is not intended to be approved under Section 15.37 of FCC Rules and Regulations.

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2. TECHNICAL SPECIFICATIONS

2-1 Transmitter's specifications

- Model number : KBRASTU11
- Power source : CR 2025 (Lithium battery 3V)
- Nominal voltage : 2.85V/3.0V(On load/Off load)
- Center frequency : 315MHz
- Number of channels : 1
- Emission designator : H1D
- Type of antenna : P.C.B pattern antenna
- Method of frequency generation : Crystal (SAW)
- Frequency multiplication : 1

2-2 Transmitter's characteristics

- Maximum output field strength : $6,000 \mu \text{ V/m} (@3\text{m})$
- Maximum spurious radiation : FCC rules Parts 15;15.209
- Frequency tolerance : $315\text{MHz} \pm 6.5 \text{ kHz}$

2-3 Receiver's specifications

- Model number : KBRGSTU11
- Power source : Regulated lead-acid battery
- Nominal voltage : 12V
- Operating frequency : 315MHz
- Number of channels : 1
- Type of receiver : Super heterodyne
- Type of antenna : Integral copper wire antenna
- Method of frequency generation : Crystal
- Intermediate frequencies : 10.7MHz

2-4 Receiver's characteristics

- Sensitivity : $-8 \pm 6 \text{ dB } \mu \text{ V (SINAD 20)}$
- Radiated emission limits : FCC rules Part 15;15.109