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, KBRGSTU10.

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 instrument panel cross member of the motor vehicle. The construction of the system is given in section 1-2.

By loading a battery cell into the transmitter, then;

1. To press the "LOCK" button for at least 60 milliseconds which required for the transmitter to recognize the state of switch ON or OFF, radiates (A+B) coded signals to be received by the control unit installed in the vehicle to lock all doors, and the horn chirp and flash the hazard lamps twice for indicator purpose.
2. To press the "UNLOCK" button for at least 60 milliseconds, the radiation (A+C) codes occurs for unlock the driver's door, and flash the hazard lamp once for indicator purpose.
3. To press the "UNLOCK" button for longer than 1.5 seconds or pressed twice within 5 seconds, the transmitter radiates the coded signal (A+C then A+E) to performing to unlock all doors.
4. To press the "PANIC" button for longer than 0.5 seconds, the transmitter radiates (A+D) codes to sound the alarm and the head lights on for approximately 30 seconds. During sounding alarm period, to press "PANIC" button again radiates (A+D) codes again and it stops the horn sounding.
5. To press the "TRUNK" button for longer than 0.5 seconds, the transmitter radiates (A+F) codes to unlock the vehicle trunk lid.
6. To press the "LOCK" and "UNLOCK" buttons simultaneously at least 2 seconds, the transmitter radiates (A+G) codes to switch one mode which deactivate the horn chirp and the hazard flashing as the indicator on locking 1 above and other mode which activate them.

The control unit compares the received codes with the pre-stored codes in its non-volatile memory, and activates the door lock actuator to lock or unlock, trunk lid unlock, activates the horn relay to panic alarm, and flash hazard lamps for the indicator purpose of the control unit activation.

If two or more buttons pressed simultaneously, except 6 above, the transmitter ceases operation immediately after recognizing that more than one buttons are being operated.

The signal radiated is consisted by a header code (A), which is 4.8 millisecond pulses with 50% duty, continued for 345 milliseconds, to wake-up the control unit, and followed by ID codes, a 24 bit unique ID portion combined with 4 bit function codes, which represents above (B) to (G) codes.

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

The timing diagrams are given in section 1-3.

1-2 SYSTEM CONSTRUCTION

The construction of the system is shown below:

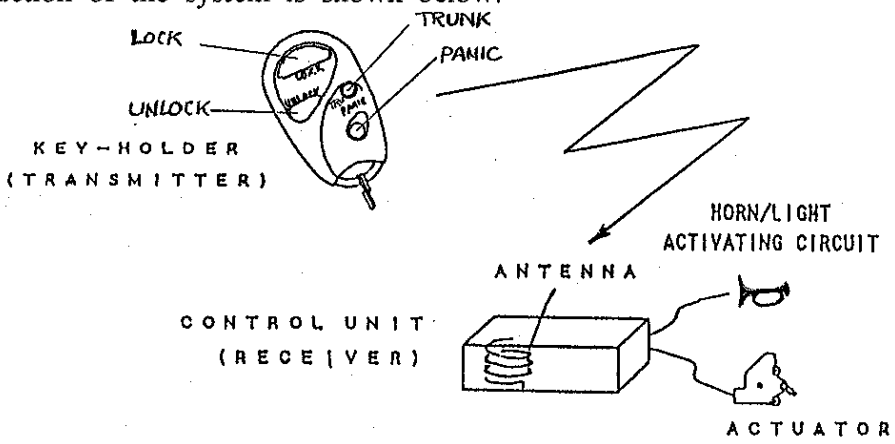
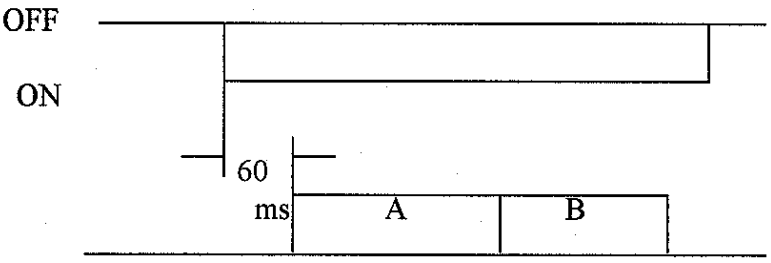


Figure 1-1 : System construction

1-3 TIMING DIAGRAM

The timing diagrams of the system are shown below:

1. "LOCK" SW.



2. "UNLOCK" SW.

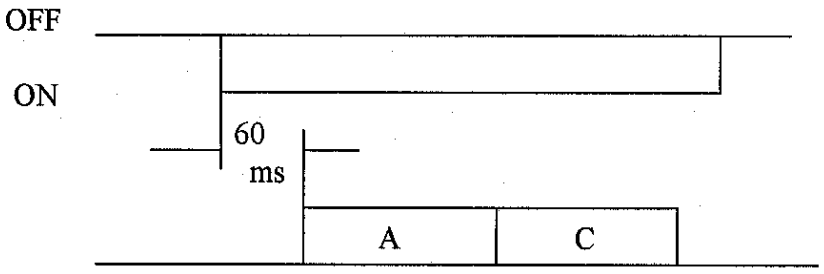


Figure 1-2 : Timing Diagram (I)

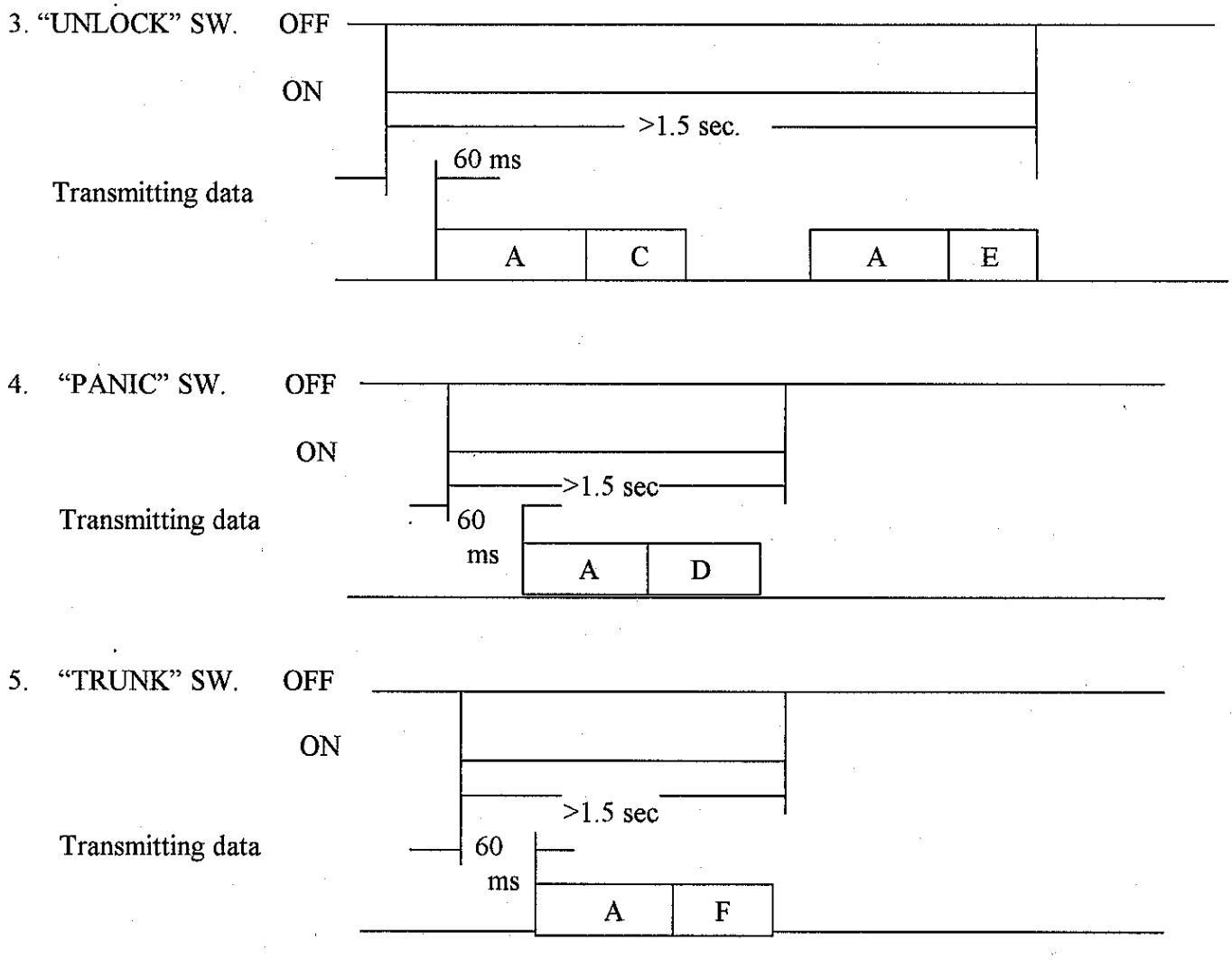


Figure 1-3 : Timing Diagram (II)

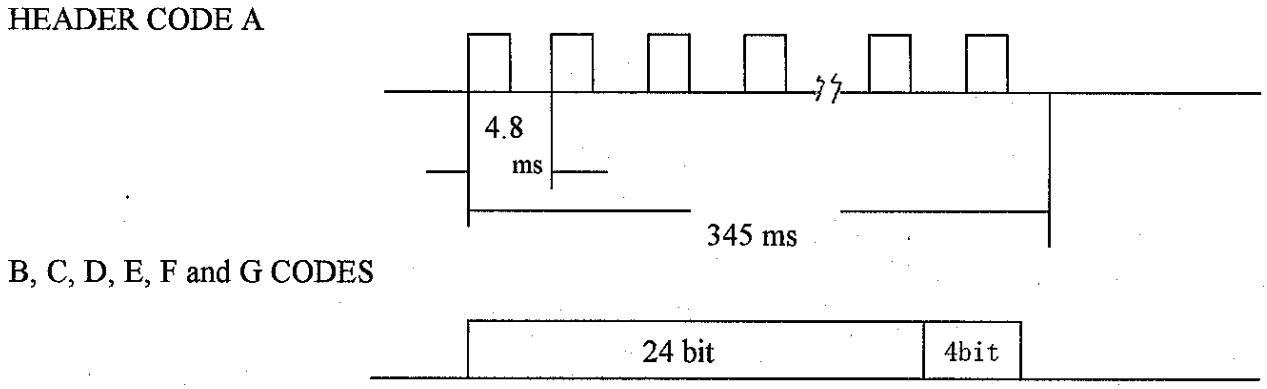


Figure 1-3 : Details data transmitted

1-4 APPLIED REGULATIONS

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

1-5 TRANSITION PROVISIONS

This device is not affected by Section 15.37, transition rule.

TECHNICAL SPECIFICATIONS

2-1 Transmitter's specifications

- Model number : KBRASTU10
- 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 : SAW
- Frequency multiplication : 1

2-2 Transmitter's characteristics

- Maximum output field strength : 6,000 μ V/m (@3m)
- Maximum spurious radiation : FCC rules Parts 15;15.209
- Frequency tolerance : 315MHz $\pm$ 64 50 kHz

2-3 Control unit with receiver's specifications

- Model number : KBRGSTU10
- 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 Control unit with receiver's characteristics

- Sensitivity : -6 $\pm$ 4/6 dB μ V (SINAD 20)
- Radiated emission limits : FCC rules Part 15;15.109