

10Pin Earphone Microphone Specification

for

Mobile Equipment

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References

Reference	Description
[10Pin-EXT]	10Pin External Interface Specification for Mobile Device Revision1.1.0, Vodafone K.K.

1. Purpose

This document defines special remarks on the following devices regarding the external device interface using the connector defined in [10Pin-EXT] (hereafter called “10Pin-connector”).

- Earphone Microphone(⌘)
- Remote Controller
- Handset (the behaviours of an external device defined in this document)

(⌘) Table 1-1 below shows the types of Earphone Microphones defined in this document:

Table1-1. Earphone Microphone Type and Name Specified in this Document

Earphone Mike Type	Name Specified for this Doc.
Earphone Microphone with Switch(monaural)	Earphone Mike with Switch (TypeA)
Earphone Microphone with Switch (stereo)	Earphone Mike with Switch (TypeB)
Earphone Microphone with Audio Remoto Controller (without LDC)	Earphone Mike with Audio Remocon(TypeA)
Earphone Microphone with Audio Remote Controller (with LDC)	Earphone Mike with Audio Remocon(TypeB)

*Comply with [10Pin-EXT] for any other descriptions out of this document.

2. Scope

This document shall be applied to any mobile device with a 10Pin-connector regardless of a mobile generation type (2G,2.5G,3G etc.) .

3. Connector Terminal

Table 3-1 shows the specification for a 10Pin-connector defined in this document. An appropriate connector shall be assigned to a handset depending on an earphone mike type identified through the procedure of the external device detection.

This document defines the prohibitions on the connector use as follows:

- Do not assign different connector's terminal specifications from those in Table 3-1 for one's own purpose.

Even though each connector receives unsupported signals, it shall not operate abnormally. Also, the best way to prevent from any damages shall be provided for a handset and an external device even against input/output of unsupported signals.

Table 3-1 Connector Terminal Specification

PIN No.	Signal Direction		Terminal Specification	Signal Level	Earphone Mike w/ Switch		Earphone Mike w/ Audio Remocon	
	Handset	External Device			Type A	Type B	Type A	Type B
1	—		Voice GND	GND connection to handset	•	•	•	•
2	←		Mike Input	-45dB 【Reference Value】 (⁽²⁾) (0dB=1V/Pa, at 1KHz、 Bias : 2.2KΩ、 Reference Voltage : 2V)	•	•	•	•
3	←		External Device Detection Lo = Detected Open = Not detected	When external device is connected Lo : GND connection to external device When External device is not connected Open : Pull up by handset (VDD)	•	•	•	•
4	→		Earphone (R) Output	-25dBV 【Reference Value】 (⁽²⁾) Load Impedance : 32Ω	—	•	•	•
5	→		Earphone (L) Output	-25dBV 【Reference Value】 (⁽²⁾) Load Impedance : 32Ω	•	•	•	•
6	←		Stereo/Monaural Detection Lo = Stereo Open = Monaural	at Stereo Lo : GND connection to external device at Monaural Open : Pull up by handset (VDD)	—	•	•	•
7	→		Power	VDD=3±0.3V	—	—	•	•
8	←		Upstream serial Lo (within 1 sec.)=UART Control Hi=OFF, or Control waiting Switch Detection(⁽²⁾) Lo (within 1 sec.)=Switch ON Hi = OFF	Hi : 0.8VDD ~ VDD Lo : 0 ~ 0.2VDD	•	•	•	•
9	→		Downstream serial (UART Control)	Hi : 0.8VDD ~ VDD Lo : 0 ~ 0.2VDD	—	—	•	•
10	—		Digital GND	GND connection to handset	—	—	•	•

(⁽²⁾) Reference value. The implementation shall be adjusted within no impact on usual use.

4. Rules for Handset

Below defines the functions to be mounted to a handset.

4.1. External Device Types, Functions, and Supports

Table 4.1-1 shows the external device types and the handsets to use these devices defined in this document.

A handset shall be able to connect to every type of earphone mikes.

Also, when a monaural earphone is connected to a stereo-compatible handset, the earphone shall operate as a monaural earphone (only the left earphone shall output voice).

However, the handset supporting the earphone mikes with audio remocon shall support Type B (of an earphone mike with audio remocon).

Table 4.1-1 Scope of Earphone Mikes

Earphone Mike Type	Supported Handset		
	2G HS	2.5G HS	3G HS
Earphone Mikes with Switch (Type A)	M	M	M
Earphone Mikes with Switch (Type B)	O	M	M
Earphone Mikes with Audio Remocon (Type A)	O	O	O
Earphone Mikes with Audio Remocon (Type B)	O	O	O

M: Mandatory O: Optional

4.2. Ringing Behaviour of Ringtone in the Manner Mode

Table 4.2-1 shows a ringing behaviour of ringtone in the manner mode with earphones plugged.

Table 4.2-1 Ringing Behaviour of Ringtone in the Manner Mode

Manner Mode	Ringing Behaviour of Ringtone
OFF	• Ringing from both earphones and handset speakers
ON	• Ringing only from earphones

4.3. Operating Handset by Pressing Audio Remocon Switch

For Earphone Mikes with Audio Remocon (TypeA & B), Table 4.2-1 shows the handset operations by pressing an audio remocon switch. Also, the handset supporting audio remocon defined in this document must provide operations based on Table 4.3-1.

In addition, an audio remocon switch shall be deactivated unless a handset activates the switch operation (e.g. valid volume switch during voice call, etc.) in order to avoid abnormal behaviours from either the handset or the audio remocon.

Table 4.3-1 Operating Handset by Pressing Audio Remocon Switch

No.	Switch Type	Handset Operations
1	TONE	It toggles the sound effect settings (except train mode).
2	TRAIN	It toggles sound effects (train mode) at on/off.
3	PLAY/SET	It toggles the playback mode settings. (repeat 1 track → repeat all tracks → random playback)
4	VOL (-)	Each switch press turns the volume down by the single volume level.
5	VOL (+)	Each switch press turns the volume up by the single volume level.
6	REW	Short Press: Skip to backward(↶), Long Press(1 sec. or above):Fast-rewind
7	FF	Short Press : Skip to forward, Long Press (1 sec. or above) : Fast-forward
8	PLAY/STOP	The first press starts playback and the second press stops it.
9	HOLD	It performs the hold setting.
10	CALL	Presses in the standby mode and in the calling mode are on-hook and off-hook respectively.
11	DISPLAY	It toggles the display settings in a character display area. (title → track no. → playback time → current time, etc. as audio player information)

(↶) Short press during a song playback jumps back to the first part of the same song.

5. Rules for Earphone Mikes

Below defines the required functions for an earphone mike.

This section separately defines Earphone Mikes with Switch (TypeA & B) and Earphone Mikes with Audio Remocon (TypeA & B).

5.1. Pull-out Direction of Cable

As Figure 5.1-1 shows below, pull out a cable for earphone mikes to the 10Pin-connector's direction to pull it horizontally.

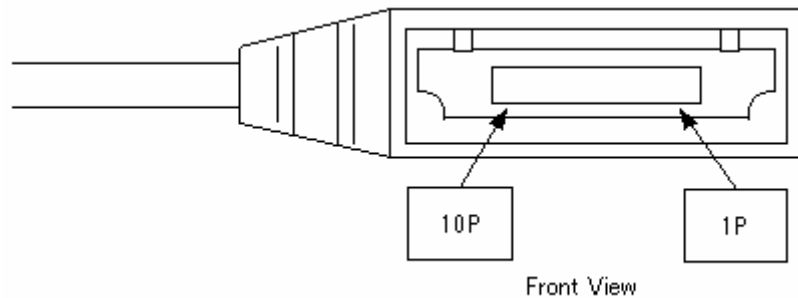


Figure 5.1-1 Pull-out Direction of Cable

5.2. Earphone Mikes with Switch

Below provides special remarks on Earphone Mikes with Switch (TypeA & B).

5.2.1. Mandatory Functions

Table 5.2.1-1 shows the required functions for Earphone Mikes with Switch (TypeA & B).

The CALL switch for Earphone Mikes with Switch shall be deactivated unless a handset activates the switch (e.g. Call switch operation in standby, etc.)

Table 5.2.1-1 Functions of Earphone Mikes with Switch

No.	Function	w/ Switch	
		Type A	Type B
1	Voice Call (incl. initiation/incoming, termination))	M	M
2	Monaural Voice Output	M	-
3	Stereo Voice Output ⁽⁻⁴⁾	-	M
5	Microphone	M	M
6	CALL Switch	M	M
8	Monaural Earphone ⁽⁻⁵⁾	M	-
9	Stereo Earphone	-	M
11	One-touch Call	M	M

M : Mandatory

- (-4) In the case of a handset for stereo voice output, a type of voice output from both Lch and Rch earphone connector terminals shall also include a notification sound type (ringtone, etc.). (The voice output from both Lch and Rch connector terminals may be identical in the monaural mode.)
- (-5) The stereo earphones plugged into the handset for monaural voice output shall operate as a monaural earphone (only Lch earphone outputs voice).

5.2.2. Switch Type

Table 5.2.2-1 shows the switch type for Earphone Mikes with Switch (TypeA & B).

Table 5.2.2-1 Switch Type for Earphone Mikes with Switch

No.	Switch Type	Description	w/ Switch	
			Type A	Type B
1	CALL	Initiate/Terminate	M	

M : Mandatory

5.2.3. One-touch Call Function

When the signal from No.8 Pin of a 10Pin-connector turns to the low signal by pressing CALL switch for 1 second or longer (Long Press) in the standby mode, comply with Table 5.2.3-1 to handle it depending on the state of the phonebook entry.

Table 5.2.3-1 One-touch Call Function for Earphone Mikes with Switch

Switch Operation	State	Handling
Long Press (1 sec. or longer)	1) When entry of No.000 exists in the phonebook	Inform of pressed switch with sound and start calling
	2) When entry of No.000 does not exist in the phonebook	Ring error sound

However, comply with Table 5.2.3-2 when the CALL switch is deactivated to call.

Table 5.2.3-2 Mobile Operation when Disabling One-touch Call

Identification of CALL Switch Press by Handset	Determination of Call NG	Mobile Sound Operation
OK	When switch is pressed	Error sound when a switch is pressed
OK	At calling operation	Pressed switch notification sound when a switch is pressed, plus error sound at calling operation
NG(*)	-	No sound

(*) This is the case of that a handset deactivates the CALL switch in the disabled calling state.

5.3. Earphone Mikes with Audio Remocon

Below provides special remarks on Earphone Mikes with Audio Remocon (TypeA & B).

5.3.1. Mandatory Functions

Table 5.3.1-1 shows the functions to be mounted to Earphone Mikes with Audio Remocon (TypeA & B).

Table 5.3.1-1.Functions of Earphone Mikes with Audio Remocon

No.	Function	w/ Audio Remocon	
		Type A	Type B
1	Voice Call (incl. initiation/incoming, termination)	M	M
2	Monaural Voice Output ⁽⁷⁾	-	-
3	Stereo Voice Output ⁽⁷⁾	M	M
4	Audio Control	M	M
5	Microphone	M	M
6	CALL Switch	M	M
7	Audio Switch	M	M
8	Monaural Earphone ⁽⁸⁾	-	-
9	Stereo Earphone	M	M
10	LCD Display	-	M
11	One-touch Call	M	M

M : Mandatory

⁽⁷⁾ In the case of a handset for stereo voice output, the type of voice output from both Lch and Rch earphone handsets shall also include a notification sound type (ringtone, etc.). (The voice output from both Lch and Rch handsets may be identical in the monaural mode.)

⁽⁸⁾ The stereo earphones plugged into the handset for monaural voice output shall work as a monaural earphone (only Lch earphone outputs voice).

Table 5.3.1-2 shows the functions to be mounted for the audio control function.

Table 5.3.1-2 Audio Control Function

No.	Audio Control Function
1	Sound Effect Setting (except train mode)
2	Sound Effect Setting (train mode)
3	Playback Mode Setting (Repeat 1 track → Repeat all tracks→ Random playback)
4	Volume Change
5	Skip to backward
6	Skip to forward
7	Fast-rewind
8	Fast-forward
9	Playback
10	Stop
11	Pause

5.3.2. Switch Type

Table 5.3.2-1 shows the operation switch types to be mounted for Earphone Mikes with Audio Remocon (TypeA & B). Though there are 11 types of switches assumed in the table. As far as all the necessary functions are provided, the number of switches to be mounted may increase or decrease. However, simplicity and easiness in operation shall be maintained.

Table 5.3.2-1 Switch Types of Earphone Mikes with Audio Remocon

No.	Switch Type	Function	w/ Audio Remocon	
			Type A	Type B
1	DISPLAY	Display Change	—	M
2	TONE	Sound Effect	M	
3	PLAY/SET	Playback Mode	M	
4	TRAIN	Train Mode	M	
5	VOL (-)	Volume (-)	M	
6	VOL (+)	Volume (+)	M	
7	REW	Skip to backward / Fast-rewind	M	
8	FF	Skip to forward / Fast-forward	M	
9	PLAY / STOP	Playback / Stop / Pause	M	
10	CALL	Call Initiation / Termination	M	
11	HOLD	Swich Hold	M	

M: Mandatory

5.3.3. Pressed Switch Notification

When a switch is pressed down, it shall be notified through the pressed switch notification command regardless of ON/OFF of the HOLD switch.

If the HOLD switch is turned to ON during switch pressed, all other switches are released and only HOLD switch pressed is notified to a handset. Also, the switching between ON and OFF shall be notified to a handset.

However, switch pressed can be cancelled while the HOLD switch is ON independently without notification to a handset needed.

Though up to two switches pressed at the same time shall be notified to a handset, three switches pressed simultaneously shall not be notified to the handset. Also, when the third switch is pressed while two other switches are already pressed, there is no notification needed for the third switch pressed. (i.g. only the first two switches pressed are notified to a handset.)

The pressed switch notification shall be indicated also when the switch is released.

5.3.4. One-touch Call Function

When the CALL switch is pressed for 1 second or longer and it is notified by "Pressed Switch Notification", handle it based on Table 5.3.4-1 depending on the registry state of a phonebook.

Table 5.3.4-1. One-touch Call Function for Earphone Mikes with Audio Remocon

Switch Operation	State	Handling
Long Press (1 sec. or longer)	1) When entry of No.000 in the Phonebook exists	Inform of switch pressed by sound and notification sending
	2) When entry of No.000 in the phonebook does not exist	Alert by error sound

5.3.5. Earphone Mikes with Audio Remocon (Type B)

Below defines the specific functions of Earphone Mikes with Audio Remocon (Type B) equipped with LCD. There shall not be anything displayed during negotiation.

5.3.5.1. Indications in LCD of Earphone Mikes with Audio Remocon (Type B)

Table 5.3.5.1-1 shows the mandatory functions for Earphone Mikes with Audio Remocon (Type B).

Table5.3.5.1-1. Indications in LCD of Earphone Mikes with Audio Remocon (Type B)

No.	Indication	Description
1	Earphone Function Setting	• Display either “both HS speakers and earphones” or “earphones only” mode.
2	Incoming Setting	• Display either “Exit Player Indicator” or “Show Message Indicator” mode regarding reception notification to earphones.
3	Audio Player Information	• Audio Player information to be displayed shall included title, track no. and playback time.
4	Voice Reception	• If a sender’s name is registered in a phonebook, the name shall be displayed at Incoming Call. If not, the sender’s phone number shall be displayed. For a hidden number, the “hidden number” indication shall be displayed. Display a missed-call indicatorgram for a missed call. If Audio Player is OFF/ON, the above displays are not needed.
5	Mail Reception	• The “unread” indicatorgram shall be displayed at Incoming mail and simultanously, if the sender’s name is registered in a phonebook, the name shall be also displayed. If not registered, the sender’s address shall be displayed instead. If Audio Player is OFF/ON, the displays above are not needed.
6	Station Reception	• The “unread” indicatorgram shall be displayed at New Station Information.
7	Web Reception	• The “unread” indicatorgram shall be displayed at Incoming Web.
8	Time Display	• The current time shall be displayed, synchronizing with the 1 setup in a handset. Use the character display command to display this information.
9	Battery Power Level	• The battery power level shall be displayed, synchronizing with the 1 setup in a handset.
10	Electric Field Intensity	• Electric field intensity shall be displayed, synchronizing with the 1 setup in a handset.
11	Unchecked Arrival Alert	• The unchecked arrival alert shall be appear to display the unread indicator. The display timing in LCD of a handset is same as the indicator display.
12	Character Display	• A handset shall be able to instruct to display other character strings than indicator display by using the character display command.

5.3.5.2. LCD Display Function

Table 5.3.5.2-1 shows display capabilities required in the LCD character display area.

Table 5.3.5.2-1 LCD Display Capabilities

LCD Display Capabilities	
Character Display Area	Height 12 dots × Width 72 dots or above • Double-byte Font (12×12 dots) : 6 characters display or above • Single-byte Font (12×6 dots) : 12 characters display or above
Character Codes	ASCII, Shift-JIS (JIS X0208) , proprietary external character codes by remocon manufacturer

5.3.5.3. Timing and Cycle of Blinking

In indicator display and character display, blinking enables to be specified by the command in a handset. The blinking cycle shall be 1 second and the blink timing shall be synchronized with other indicator displays.

5.3.5.4. Automatic Scroll

Earphone Mikes with Audio Remocon (Type B) shall use automatic scroll (⁹) in the character display area. Automatic scroll is defined as follows:

- Automatic scroll control (scroll interval, scroll amount) shall be set up by the scroll control command at negotiation.
- Earphone Mikes with Audio Remocon (Type B) display the first character string. Then, automatic scroll starts from right to left in 1 second after all the remaining character strings are received (¹⁰) from a handset.
- When the last character in a buffer scrolls out, the first character shall appear from the buffer again and start scrolling. Comply with the scroll mode specified by the character display command (Refer to 5.3.6.1.5 Character Display Command for scroll mode).

(⁹) When a new character display command is received and the character size exceeds over the size of character display area, this automatic scroll activates to display the remaning part of the character.

(¹⁰) It is when the “end” of the character display command is received. Earphone Mikes with Audio Remocon (Type B) must have 256 bytes or above as a buffer to store character codes for automatic scroll. If the character size sent from a handset exceeds over the limit buffer size of Earphone Mikes with Audio Remocon (Type B), the exceeded characters shall be discarded.

5.3.5.5. Back Light ON/OFF Function

LCD back light ON/OFF is controlled by a handset's instruction.

Table 5.3.5.5-1 shows the light ON timing.

A back light turns off automatically in 1 minute after the light turns up by a handset's instruction.

Table 5.3.5.5-1 ON Timing of Back Light

No.	Timing
1	When a reception event occurs (unless notification to earphones is set at OFF)
2	When a remocon switch is off (except HOLD switch)

5.3.5.6. Font Data and Character Code

The following character codes are compatible to display.

- ASCII
- Shift-JIS (JIS X0208)
- External character codes

Use the font data mounted in Earphone Mikes with Audio Remocon (Type B) regarding fonts.

When an invalid code is specified within the range of double-byte character codes, display a double-byte space instead.

Simlutenously, when an invalid code is specified within the range of single-byte character codes, display a single-byte space instead.

The following region codes shall be assigned for character codes used for bit-mapped data registry.

- user's defined region codes in Shift-JIS for a double-byte bit map
- non-use codes in ASCII for a single-byte bit map

Table 5.3.5.6-1 shows the range for double-/single-byte character codes.

Table 5.3.5.6-1. Character Code Range

Type	Character Code Range
Double-byte Character	0x8100 ~ 0x9FFF
	0xE000 ~ 0xFFFF
Double-byte Bit Map	0xF040 ~ 0xF1E5
Single-byte Character	0x00 ~ 0x80
	0xA0 ~ 0xDF
Single-byte Bit Map	0x00 ~ 0x1F

Earphone Mikes with Audio Remocon (Type B) stores external characters to display for the following purposes in Table 5.3.5.6-2 in a character display area.

Note: Since the codes in the table are outside of Shift-JIS, they are usable only when recognized as earphone mikes with LCD audio remocon at negotiation and character display is performed in the earphone mikes with LCD audio remocon.

Table 5.3.5.6-2 External Character Codes for Earphone Mikes with Audio Remocon (Type B)

Code	Display	Code	Display
0xFD40	Web Reception	0xFD4F	Reserved
0xFD41	Station Reception		
0xFD42	Mail Reception		
0xFD43	Missed Call		
0xFD44	Message Keep		
0xFD45	Voice Recording (easy voice mail)		
0xFD46	Incoming Call		
0xFD47	Volume A (level 1)		
0xFD48	Volume A (level 2)		
0xFD49	Volume A (level 3)		
0xFD4A	Volume A (level 4)		
0xFD4B	Volume A (level 5)		
0xFD4C	Volume A (level 6)		
0xFD4D	Volume B (level 1)		
0xFD4E	Volume B (level 2)	0xFDFF	

The followings are the notes on code designation for code display in LCD of Earphone Mikes with Audio Remocon (Type B).

1) Volume A

- Each code contains 6 volume levels as 1 unit (1 character in a character display area).
- The first 6 levels can be up sequentially in a code. Then, another code is combined with the first code for the next 6 levels (hereafter called as “Carry”). (e.g. 6 levels + 6 levels + 1 level = 13 levels, etc...)
- However, carry is applied only after all six levels are up in each code. (e.g. 5 levels + 5 levels + 3 levels = 13 levels is NG)

2) Volume B

- Each code contains 2 volume levels as 1 unit (1 character in a character display area).
- The first 2 levels can be up in a code sequentially. Then, another code is combined with the first code for the next 2 levels (e.g. 2 levels + 1 level = 3 levels, etc...)
- However, carry is applied only after all 2 levels are up in each code. (e.g. 1 levels + 2 levels + 1 levels = 4 levels is NG)

3) Other Notes

- Earphone Mikes with Audio Remocon (Type B) shall be mounted concerning both cases of “a” and “b” below.
 - a. LCD Remocon to display volume with images;
The images are supposed to be lined up horizontally to display. Even though carry occurs, any image designs shall be adopted in consideration of alignment balance according to the assumption above similarly with code designation.
 - b. LCD Remocon to display volume with anything else except images;
The code designation shall be expressed with “numerals” or “characters” compatible with Earphone Mikes with Audio Remocon to display.
Ex) Code designation has three levels (2+1=3 levels);
 - Numerals → Display as “vol.3”.
 - Characters → Display as “▲”. (where 1 level=□, 2 level=●, and 3 level=▲)

5.3.6. Packet Format

5.3.6.1. Command Packet Format for Earphone Mikes with Audio Remocon (Type B)

For Earphone Mikes with Audio Remocon (Type B), this section defines the details of each command packet used for notification to Earphone Mikes with Audio Remocon (Type B) from a handset. Table 5.3.6.1-1 shows a list of the commands.

Table 5.3.6.1-1.Command Packet List

Byte0	Toggle Bit	Command Packet Type
0x06	0	Character Area Scroll Setting Command
0x07	1	
0x08	0	Bit Map Data Registry Command
0x09	1	
0x0A	0	Display Control Command
0x0B	1	
0x0C	0	LCD Contrast Control Command
0x0D	1	
0x10	0	Character Display (continue or display) Command
0x11	1	
0x20	0	Indicator Display Command
0x21	1	
0x30	0	Animation Display Command
0x31	1	
0x70	0	Vendor's Unique Command ⁽¹¹⁾
0x71	1	

⁽¹¹⁾ Audio remocon manufacturers define a command uniquely. This command is used for tests by the manufacturers; it has no guarantee for compatibility with competitors' audio remocons.

5.3.6.1.1. Character Area Scroll Setting Command

- This command enables a handset to inform Earphone Mikes with Audio Remocon (Type B) of scroll amount and scroll time interval during negotiation between a handset and Earphone Mikes with Audio Remocon (Type B). This command is effective only at negotiation between a handset and Earphone Mikes with Audio Remocon (Type B). (Change during normal communication is NG.)

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0000 011
	Bit0	Toggle Bit
Byte1	Bit7	Reserved (Default : 0)
	Bit6 ~ 5	Scroll Amount Control (Scroll dot amount specified from the current displaying position) 00 : 1 dot scroll 01 : 2 dot scroll 10 : 3 dot scroll 11 : 6 dot scroll
	Bit4 ~ 0	Scroll Time Interval Designate time to move specified dot amount. 00000 : Return to default 00001 : 50 mSec 00010 : 60 mSec 00011 : 70 mSec 00100 : 80 mSec 00101 : 90 mSec 00110 : 100 mSec 00111 : 110 mSec 01000 : 120 mSec 01001 : 130 mSec 01010 : 140 mSec 01011 : 150 mSec 01100 : 160 mSec 01101 : 170 mSec 01110 : 180 mSec 01111 : 190 mSec 10000 : 200 mSec 10001 : 250 mSec 10010 : 300 mSec 10011 : 350 mSec 10100 : 400 mSec 10101 ~ 11111 : Reserved
Byte2	Bit7 ~ 0	BCC

5.3.6.1.2. Bitmap Data Registry Command

- This command is used to read bitmap data into font codes from RAM of Earphone Mikes with Audio Remocon (Type B) where the data is once registered.
- Through this command, the bitmap data once registered enables to display the font codes designated by the character display command similarly with ASCII or Shift-JIS. (Refer to 5.3.5.6 Font Data and Character Code for the code range of bitmap data.) The size of bitmap data shall be 18 bytes in double-byte and 9 bytes in single-byte.
- Bitmap Data shall be registered at either negotiation or normal communication. Registering bitmap data at negotiation completed is not accepted while the font codes in the character string requested to display from Earphone Mikes with Audio Remocon (Type B) is allowed to appear; however, when bitmap data registry is tried during display, the remocon shall not operate abnormally.
- Table 5.3.6.1.2-1 and Table 5.3.6.1.2-2 show bitmap data formats in double-byte size and in single-size respectively (The byte numbers in this figure is synchronized with the numbers of this command).

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0000 100
	Bit0	Toggle Bit
Byte1	Bit7 ~ 0	Font code of bitmap data to be registered Upper byte
Byte2	Bit7 ~ 0	Font code of bitmap data to be registered Lower byte (0x00 if registering a single-byte size)
Byte3 ~ n-1	Bit7 ~ 0	Bitmap Data
Byte n	Bit7 ~ 0	BCC

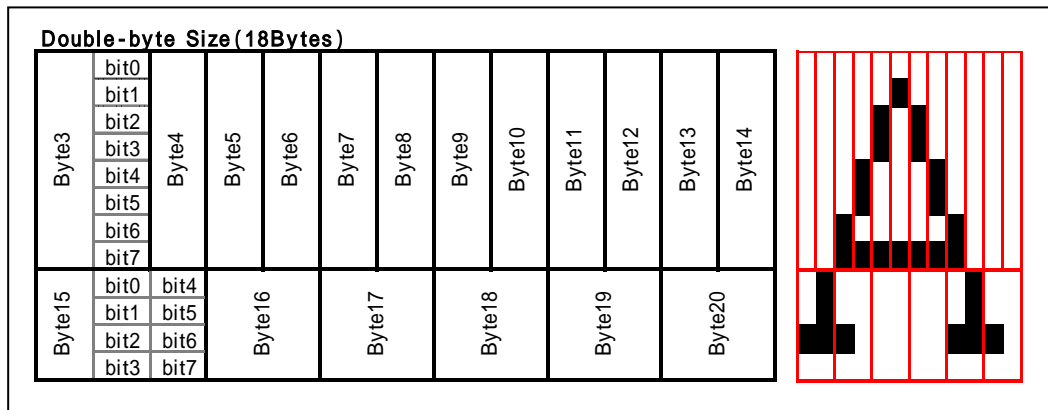


Figure 5.3.6.1.2-1 Bitmap Data Format in Double-byte Size

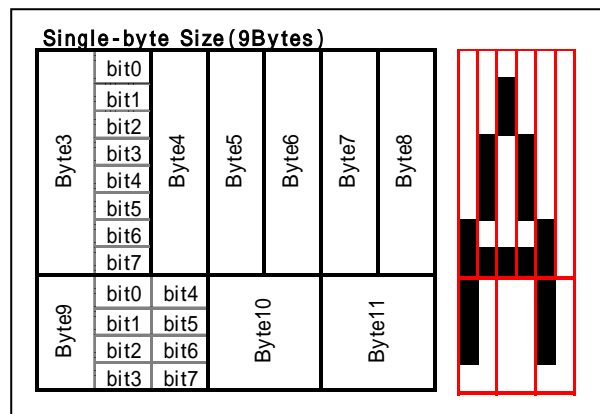


Figure 5.3.6.1.2-2. Bitmap Data Format in Single-byte Size

< Example of Commands for Double-byte Size > Toggle Bit=0
 0x08 0xF0 0x40 0x00 0x00 0xC0 0xB0 0x8C 0x82 0x8C 0xB0 0xC0
 0x00 0x00 0x00 0x74 0x04 0x00 0x00 0x74 0x04 0x3A

< Example of Commands for Single-byte Size > Toggle Bit =0
 0x08 0x00 0x00 0xC0 0xB8 0x86 0xB8 0xC0 0x00 0x07 0x00
 0x07 0x8E

5.3.6.1.3. Display Control Command

- This command enables notification from a handset to Earphone Mikes with Audio Remocon (Type B) to control character display area, indicator display area, and back light display.
- Either Back Light 1 or Back Light 2 can be specified to light up. If both back lights are specified, Earphone Mikes with Audio Remocon (Type B) shall ignore this back light on/off function.
- A handset shall inform of turning off the back light in 10 seconds after the back light is on; however, if 1 minute passed after the back light is on due to missed light-off notification, the audio remocon shall turn off the back light automatically.

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0000 101
	Bit0	Toggle Bit
Byte1	Bit7 ~ 4	Reserved (Default : 0)
	Bit3	Character Clear 0 : Nomarl Display 1 : Character Display Clear
	Bit2	Indicator Clear 0 : Nomarl Display 1 : Indicator Display Clear
	Bit1	Back Light 2 ON/OFF 0 : Back Light 2 OFF 1 : Back Light 2 ON
	Bit0	Back Light 1 ON/OFF 0 : Back Light 1 OFF 1 : Back Light 1 ON
Byte2	Bit7 ~ 0	BCC

5.3.6.1.4. LCD Contrast Control Command

- To set the LCD contrast of Earphone Mikes with Audio Remocon (Type B), this command is transmitted from a handset to Earphone Mikes with Audio Remocon (Type B).

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0000 110
	Bit0	Toggle Bit
Byte1	Bit7 ~ 4	Reserved (Default : 0)
	Bit3 ~ 0	Contrast Setting 0000 : Low : 1000 : Medium (Default) : 1111 : High
Byte2	Bit7 ~ 0	BCC

5.3.6.1.5. Character Display Command

- To display characters in the character display area of Earphone Mikes with Audio Remocon (Type B), this command is transmitted from a handset to Earphone Mikes with Audio Remocon (Type B).
- For the character strings sent by this command, the characters shall appear from the front (left side) of the character area of Earphone Mikes with Audio Remocon (Type B).
- When the character code is received with the number of characters allowed appearance in the character display area by this command, this character string shall appear in the character display area. To receive the character code sequentially, automatic scroll shall start in one second after all the character codes to display are received. However, when the number of characters received does not exceed the length of the character area, scroll shall not start.
- In scroll, the repeat method is changeable by specifying the scroll mode. Table 5.3.6.1.5-1 shows the operational differences by the scroll mode. Though the commands to stop/delete displaying are not set up in the character display area, informing of "blank space (1 character or above)" by the character display command can be substituted for those commands when there is nothing displayed in the character display area on LCD display.
- The allowed character codes are 1-byte ASCII codes for single-byte characters and two-byte Shift-JIS codes for double-byte characters. Refer to "5.3.5.6-1 Font Data and Chracter Code" for the character code range.
- For Earphone Mikes with Audio Remocon (Type B), 256 bytes shall be ensured as a buffer for character codes. If the exceeding size of a character string is sent to the buffer mounted in LCD remocon, the remocon shall discard the exceeded part.
- In the character display command, use either "End" or "Continue" depending on the state of the displayed characters. The "End" command is used to end sending the character strings by sending "character display command (End)" and the character string with the length of 12 bytes or less. The "Continue" command is used by sending "Continue" and the 12-byte-character string when still another character string remains after sending the character string. However, if the character string received by either "End" or "Continue" exceeds 12 bytes, the exceeded part of the string shall be discarded. In case of the Earphone Mikes with Audio Remocon (Type B) with the character display area exceeding 12 bytes, the display of the character string by this command shall fit into the screen. Refer to Table 5.3.6.1.5-2 for more details.

Table 5.3.6.1.5-1 Operational Step of Scroll Mode

Step	Scroll Mode: 0	Scroll Mode:1
1	Step1: Display the character string first.	Display the character string first.
2	Scroll starts after 1 second.	Scroll starts after 1 second.
3	Sequentially scroll starts after the first scroll ends. This scroll shall start after scrolling this character string in (fading in) from the right end of the character area.	Sequentially scroll starts after the first scroll ends. This scroll starts in 1 second after going back to Step 1.
4	Repeat Step 3.	Repeat Step 3.

Table 5.3.6.1.5-2 “End” and “Continue”

Character Display Command	Description
End	<ul style="list-style-type: none"> This command is used when sending the character strings is completed after this command operates (within the display size of Earphon Mikes with Audio Remocon (Type B)) or when the last packet of character strings is sent after sending several packets by the “Continue” command. When the character strings are sent only by the “End” command, the character strings blink in the screen. However, the blink display is invalid when the size of the character strings exceeds the display size and when the “Continue” command is sent before blink is designated by the “End” command. Table 5.3.6.1.5-3 shows operation patterns at blink designated. Refer to [5.3.5.3. Blinking Timing and Cycle] for blink timing and cycle.
Continue	<ul style="list-style-type: none"> This command is used when the size of the character strings to be sent exceeds the display size of Earphon Mikes with Audio Remocon (Type B) (the 1-time “End” command is insufficient to complete sending the character strings). However, the “End” command shall be used for the last character string packet The size of each character string packet by the “Continue” command must be within the display size of Earphon Mikes with Audio Remocon (Type B). <p>(ex) When the max. display size of Earphon Mikes with Audio Remocon (Type B) is 12bytes and the size of the character string to be sent is 13 bytes in total, the first packet of the 12-byte character strings is sent by the “Continue” command and the second packe of the 1-byte character strings is sent by the “End” command.</p>

Table 5.3.6.1.5-3 Operations at Blink Designated

Command Patterns when Sending Character String	Operation
(1) Only “End” (Blink Designation : Normal)	Normal Display
(1)Only “End” (Blink Designation : Blink)	Blink Display
(1) “Continue” + (2) “End” (Blink Designation : Normal) (Blink Designation : Normal)	Only Scroll for Normal Display
(1) “Continue” + (2) “End” (Blink Designation : Normal) (Blink Designation : Blink)	Only Scroll for Normal Display (blink designation by “End” is invalid until the real end part comes)

“Continue” in this table indicates 1 or multiple “Continue” commands.

Character Display Command (End)

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0001 000
	Bit0	Torggle Bit
Byte1	Bit7 ~ 3	Reserved (Default : 0)
	Bit2	Scroll Mode Designation 0 : Mode 0 (Default) 1 : Mode 1
	Bit1	Character Continue Designation 0 : End (Fixed)
	Bit0	Dot Matrix Part (Character Area) Blink Designation 0 : Normal 1 : Blink
Byte2 ~ n-1	Bit7 ~ 0	Character String Code maximum 12 bytes (n-1 < 14)
Byte n	Bit7 ~ 0	BCC

Character Display Command (Continue)

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0001 000
	Bit0	Torggle Bit
Byte1	Bit7 ~ 3	Reserved (0)
	Bit2	Scroll Mode Designation 0 : Mode 0 (Default) 1 : Mode 1
	Bit1	Character Continue Designation 1 : Continue (Fixed)
	Bit0	Dot Matrix Part (Character Area) Blink Designation 0 : Normal
Byte2 ~ 13	Bit7 ~ 0	Character String Code (12 bytes fixed length)
Byte14	Bit7 ~ 0	BCC

Examples of “End” and “Continue” in use

(Note : Toggle Bit starts from “0”.)

(Ex 1) When displaying “ A B C D E F” (Character code=6bytes)

0x10 0x00 0x41 0x42 0x43 0x44 0x45 0x46 0x17

(Ex 2) When displaying “A I U E O Ka Ki Ku Ke Ko” (Character code=20bytes)

0x10 0x02 0x41 0x42 0x43 0x44 0x45 0x46 0x47 0x48 0x49 0x4a
0x61 0x62 0x1a 0x11 0x00 0x63 0x64 0x65 0x66 0x67 0x68 0x69
0x6a 0x19

5.3.6.1.6. Animation Display Command

- This command enables a handset to inform Earphone Mikes with Audio Remocon (Type B) of displaying animation telling that audio is in playback in the character display area of Earphone Mikes with Audio Remocon (Type B).
- Byte1 is assigned to the animation number to display and Byte2 to the display time of each animation image (specified per 100ms). The designated animation repeatedly appears in the character display area.
- Animation display is repeated until new animation or character display command is provided. There is no command specifically to stop this display in the character display area. If a blank display is desired in the character display area of Earphone Mikes with Audio Remocon (Type B), "blank space (1character or more)" as the character display command can be substituted.

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0011 000
	Bit0	Toggle Bit
Byte1	Bit7 ~ 0	Animation Number 0x00 : Display Animation 1 in playback 0x01 : Display Animation 2 in playback 0x02 : Display Animation 3 in playback 0x03 : Display Animation 4 in playback 0x04 : Display Animation 5 in playback 0x05 : Display Animation 6 in playback 0x06 ~ 0xFF : Reserved
Byte2	Bit7 ~ 0	Display Time per Image 0x00 : Stop (the first image is displayed) 0x01 ~ 0x14 : 100ms ~ 2,000ms (designate by the 100ms) 0x15 ~ 0xFF : Reserved
Byte3	Bit7 ~ 0	BCC

5.3.6.1.7. Indicator Display Command

- This command enables a handset to inform Earphone Mikes with Audio Remocon (Type B) of displaying an indicator. When multiple commands exist with the same indicator ID, the last command is valid. The maximum size by this command is 20bytes and the maximum number of indicators to be designated is 9.

Byte	Bit	Specification
Byte0	Bit7 ~ 1	0010 000
	Bit0	Toggle Bit
Byte1	Bit7 ~ 0	Indicator ID 0x00 : Reserved 0x01 : Playback Mode Indicator 0x02 : Reception Priority Setting Indicator 0x03 : Earphone Mike Switch Setting Indicator 0x04 : Battery Power Level Indicator 0x05 : Electric Field Intensity Indicator 0x06 : Train Mode Indicator 0x07 : Manner Mode Indicator 0x08 : Unchecked Arrival Alert 0x09 ~ 0xFF : Reserved
Byte2	Bit7 ~ 0	Designation in indicator display items and their states of Byte1 □Refer to 「 5.3.6.1.7.1 Playback Mode Indicator Designation 」 ~ 5.3.6.1.7.8 Notification Indicator Designation 」 for the designation formats.
Byte3 ~ n-1	Bit7 ~ 0	Same designation steps as Byte and Byte2 Byte m (m=odd number) : Indicator ID Byte m+1 : Designation in indicator display items and their states
Byte n	Bit7 ~ 0	BCC

(Ex 1) Where Random Playback : ON, “Battery Power Level 3” :ON,
0x20 0x01 0x31 0x04 0x41 0x55 (Toggle Bit=0)

(Ex 2) Where 1-track Repeat Playback : OFF, Battery Power Level 0 : Blink,
Incoming Signal Strength Medium : ON,
0x20 0x01 0x10 0x04 0x12 0x05 0x31 0x13 (Toggle Bit =0)

(Ex 3) Where “Random Playback : OFF” is designated after “Random Playback : ON”,
0x20 0x01 0x31 0x04 0x41 0x01 0x30 0x64 (Toggle Bit =0)

5.3.6.1.7.1. Playback Mode Indicator Designation

- The indicators designated in the range from Bit7 to 4 appear according to the specifications in the range from Bit3 to 0.
- When a new indicator is specified by this designation with a current indicator displayed, the new one is valid.
- Even though the designated indicator display does not impact on the current state, the remocon shall prioritize the designation from the command.
- When the upper 4 bits are designated as “0000(no designated indicator)”, “0000(OFF)” is also valid for the lower 4 bits. Thus, this command turns off all indicators to be designated.
- When “Reserved” is designated for the upper or the lower 4 bits, the remocon ignores the command.
- The blink cycle shall be 1 second (fixed) and ON/OFF shall repeat at the same timing of other indicators.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator	-
	0001 : Repeat 1 Track Playback	Appendix B. See Indicator No.1
	0010 : Repeat All Tracks Playback	Appendix B. See Indicator No.2
	0011 : Random Playback	Appendix B. See Indicator No.3
	0100 : 1 Track Playback	Appendix B. See Indicator No.4
	0101 : All Tracks Playback	Appendix B. See Indicator No.5
	0110 ~ 1111 : Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

(Ex 1) When blink is designated for “all tracks playback repeated” while “1 track playback repeated” is ON, “1 track playback repeated” turns OFF and “all tracks playback repeated” starts blinking.

(Ex 2) When OFF is designated for “random playback” while “1 track playback repeated” is ON, both “1 track playback repeated” and “random playback” turn OFF.

5.3.6.1.7.2. Designation of Reception Priority Setting Indicator

- Refer to Playback Mode Indicator for the ON/OFF method.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator	-
	0001 : Reserved	-
	0010 : Exit Player	Appendix B. Refer to Indicator No. 6
	0011 : Show Message	Appendix B. Refer to Indicator No. 7
	0100 ~ 1111 : Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

5.3.6.1.7.3. Designation of Earphone Switch Setting Indicator

- Refer to Playback Mode Indicator for the ON/OFF method.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator	-
	0001 : Earphone Mike	Appendix B. Refer to Indicator No. 8
	0010 : Earphone Mike + SP	Appendix B. Refer to Indicator No. 9
	0011 ~ 1111 : Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

5.3.6.1.7.4. Designation of Battery Power Level Indicator

- Refer to Playback Mode Indicator for the ON/OFF method.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator	-
	0001 : Battery Power Level 0	Appendix B. Refer to Indicator No. 10
	0010 : Battery Power Level 1	Appendix B. Refer to Indicator No. 11
	0011 : Battery Power Level 2	Appendix B. Refer to Indicator No. 12
	0100 : Battery Power Level 3	Appendix B. Refer to Indicator No. 13
	0101 ~ 1111 : Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

5.3.6.1.7.5. Designation of Electric Field Intensity Indicator

- Refer to Playback Mode Indicator for the ON/OFF method.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator (out of service)	-
	0001 : Extremely Weak	Appendix B. Refer to Indicator No. 14
	0010 : Weak	Appendix B. Refer to Indicator No. 15
	0011 : Medium	Appendix B. Refer to Indicator No. 16
	0100 : Strong	Appendix B. Refer to Indicator No. 17
	0101 ~ 1111 Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

5.3.6.1.7.6. Designation of Train ModelIndicator

- Refer to Playback Mode Indicator for the ON/OFF method.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator	-
	0001 : Train Mode	Appendix B. Refer to Indicator No. 18
	0010 ~ 1111 : Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

5.3.6.1.7.7. Designation of Manner ModelIndicator

- Refer to Playback Mode Indicator for the ON/OFF method.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator	-
	0001 : Manner Mode	Appendix B. Refer to Indicator No. 18
	0010 ~ 1111 : Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

5.3.6.1.7.8. Designation of Unchecked Arrival Alert Indicator

- Refer to Playback Mode Indicator for the ON/OFF method.

Bit	Specification	Indicator
Bit7 ~ 4	0000 : No Designated Indicator	-
	0001 : Unchecked Arrival Alert (!)	Appendix B Refer to Indicator No. 20
	0010 ~ 1111 : Reserved	-
Bit3 ~ 0	Display Designation 0000 : OFF 0001 : ON 0010 : Blink 0011 ~ 1111 : Reserved	-

5.3.6.2. Notification Packet Format

The details of each Notification packet are defined, which are used to convey a notice from a handset to Earphone Mikes with Audio Remocon (Type A & B).

The handling of handset is defined when each notification packet is conveyed from the remocon to the handset

Table 5.3.6.2-1 shows a list of notification packets.

Table 5.3.6.2-1. Notification Packet List

Byte0	Toggle Bit	Type of Notification Packet
0x80	0	Reset Notification
0x81	1	
0x82	0	Class Reset Notification (Audio Remocon)
0x83	1	
0x84	0	Pressed Switch Notification
0x85	1	

5.3.6.2.1. Reset Notification

- This notification packet is conveyed from Earphone Mikes with Audio Remocon (Type A&B) to a handset telling that reset operated when the reset operation occurred.
- When this notification packet is conveyed from the remocon, the handset shall operate according to “6. The Connection Procedure of External Device” defined in [10Pin-EXT].
- When a handset identifies a compatible device from the communication speed, the device type of reset notification, and the product number, the device shall operate as Earphone Mike with Audio Mikes defined in this specification.
- For the reset notification to be sent from Earphone Mikes with Audio Remocon (Type A&B), every notification packet received shall be valid, ignoring the toggle bit of the pressed switch packet sent from Earphone Mikes with Audio Remocon (Type A&B); however, never ignore special codes, Reset Notification, and Class Reset Notification.

Byte	Bit	Specification
Byte0	Bit7 ~ 1	1000 000
	Bit0	Toggle Bit
Byte1	Bit7 ~ 0	Manufacturer Code 0x00 : Reserved 0x01 : Vodafone 0x02 ~ 0xEF : Reserved 0xF0 ~ 0xFF : Not Defined
Byte2	Bit7 ~ 0	Type of Device 0x00 : Reserved 0x01 : Vodafone Standard LCD Remocon ver.1.0 0x02 ~ 0xEF : Reserved 0xF0 ~ 0xFF : Not Defined
Byte3	Bit7 ~ 0	Product Number 0x00 : Reserved 0x01 : LCD Remocon with Earphone Mikes (ZTCJ01) 0x02 ~ 0xEF : Reserved 0xF0 ~ 0xFF : Not Defined
Byte4	Bit7 ~ 0	BCC

5.3.6.2.2. Class Reset Notification (Audio Remocon)

- Earphone Mikes with Audio Remocon (TypeA&B) shall inform a handset of the communication speed and the number of characters in the character display area by this notification packet when reset is executed. After the remocon transmits this notification packet, the handset from the next communication shall respond to what the remocon sent. However, the communication speed must support 9,600bps.
- When a handset identifies a compatible remocon from the communication speed of the class reset notification coupled with the device type described in the previous section (reset notification), the remocon shall operate as the Earphone Mikes with Audio Remocon defined in this specification.

Class Reset Notification of Earphone Mike with Audio Remocon (Type A)

Byte	Bit	Specification
Byte0	Bit7 ~ 1	1000 001
	Bit0	Tggle Bit
Byte1	Bit7 ~ 0	Communication Speed Bit7 : 0 (fixed) Bit6 : 460,800bps Bit5 : 230,400bps Bit4 : 115,200bps Bit3 : 57,600bps Bit2 : 38,400bps Bit1 : 19,200 bps Bit0 : 9,600 bps (1 : fixed) (Set the supportable baud rate (a= "1") and clear the bit of unsupportable baud rate (="0") .
Byte2	Bit7	0 (fixed)
	Bit6 ~ 0	Reserved (Default : 0)
Byte3	Bit7	0 (fixed)
	Bit6 ~ 0	Remocon manufacturer's unique bit (Default : 0)
Byte4	Bit7 ~ 0	BCC

Class Reset Notification of Earphone Mike with Audio Remocon (Type B)

Byte	Bit	Specification
Byte0	Bit7 ~ 1	1000 001
	Bit0	Tggle Bit
Byte1	Bit7 ~ 0	Communication Speed Bit7 : 0 (fixed) Bit6 : 460,800bps Bit5 : 230,400bps Bit4 : 115,200bps Bit3 : 57,600bps Bit2 : 38,400bps Bit1 : 19,200 bps Bit0 : 9,600 bps (1 : fixed) (Set the supportable baud rate (a= "1") and clear the bit of unsupportable baud rate (="0") .
Byte2	Bit7	0 (fixed)
	Bit6 ~ 5	Reserved (Default : 0)
	Bit4 ~ 0	Character no. of characters to be displayed(single-byte conversion)
Byte3	Bit7	0 (fixed)
	Bit6 ~ 0	Remocon manufacturer unique bit (Default : 0)
Byte4	Bit7 ~ 0	BCC

5.3.6.2.3. Pressed Switch Notification

- Earphone Mikes with Audio Remocon (TypeA&B) shall transmit the pressed switch type to the handset by this notification packet when a user presses the switch.

Byte	Bit	Specification
Byte0	Bit7 ~ 1	1000 010
	Bit0	Toggle Bit
Byte1	Bit7	TONE Pressed Switch Notification 0 : Release / 1 : Press
	Bit6	TRAIN Pressed Switch Notification 0 : Release / 1 : Press
	Bit5	PLAY/SET Pressed Switch Notification 0 : Release / 1 : Press
	Bit4	VOL- Pressed Switch Notification 0 : Release / 1 : Press
	Bit3	VOL+ Pressed Switch Notification 0 : Release / 1 : Press
	Bit2	REW Pressed Switch Notification 0 : Release / 1 : Press
	Bit1	FF Pressed Switch Notification 0 : Release / 1 : Press
	Bit0	PLAY/STOP Pressed Switch Notification 0 : Release / 1 : Press
Byte2	Bit7	HOLD Pressed Switch Notification 0 : Release / 1 : Press
	Bit6 ~ 2	Reserved (Default : 0)
	Bit1	CALL Pressed Switch Notification 0 : Release / 1 : Press
	Bit0	DISPLAY Pressed Switch Notification 0 : Release / 1 : Press
Byte3	Bit7 ~ 0	BCC

When this command comes from the remocon, the handset operates according to “4.2.3 Handset Processing by Pressing Audio Remocon Switch”.

- Earphone Mikes with Audio Remocon (Type B) shall display the messages or graphics in the LCD area as the result of handset’s processing sent from a handset by the character display command or the indicator display command.
- The switches of the audio remocon are classified into two groups as shown in Table 5.3.6.2.3-1 below. More than 1 switch presseing within the same group (either Group A (No.1 to 8) or Group B (No.9 to 11)) at the same time is invalid. Pressing two switches (1 from each group) at the same time is identifiable.
- There are the following options to invalidate the secondly pressed switch in HOLD ON.

I : The audio remocon transmitts “Pressed Switch Notification” to the handset.

The handset identifies the secondly pressed switch in HOLD ON, and shall notify the LCD remocon by the character command to display telling that it is in the state of HOLD ON.

II : The audio remocon independently identifies the secondly pressed switch in HOLD ON. It shall invalidate the signal of pressed switch by the remocon independently without sending notification to the handset and display telling that it is in the state of HOLD ON.

- Even though the handset identifies unsupported signals from multiple switches pressed, the handset shall not operate abnormally such as unstable behaviour, error, reset, memory corruption, etc.

Table 5.3.6.2.3-1 Switch Group

No.	Pressed Switch	Switch Group
1	TONE	A
2	TRAIN	
3	PLAY/SET	
4	VOL (-)	
5	VOL (+)	
6	REW	
7	FF	
8	PLAY/STOP	
9	HOLD	B
10	CALL	
11	DISPLAY	

6. Interacting Behaviour

When the hands free kit and the earphone mikes defined in this specification are plugged into a handset simultaneously, both of them can be used as “Earphone function” and “Mike function”. Under the condition of only either the hands free kit or the earphone mikes to be used, the former can be prioritized. However, even in this case, “one-touch call function” and “reception/termination function” shall be usable by the CALL switch of the earphone mikes.

Appendix A.

Revision History

Revision History


















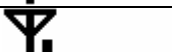
Version	Date	Comments
1.0.0	2003/05/26	Initial Version
1.1.0	2003/10/XX	Revised to add more definitions as to the handset specifications and modify mistakes.

Appendix B.

Example of LCD Display Indicators for Earphone Mikes with Audio Remocon (Type B)

Table APND- B-1 shows the example of the indicator images to be displayed in the LCD of Earphone Mikes with Audio Remocon (Type B). The official indicators are to be determined with remocon manufacturers and VF.

Table APND-B-1. Example of LCD Display Indicator Images

No.	Image Sample	Definition
1		Repeat 1 Track Playback
2		Repeat All Tracks Playback
3		Random Playback
4		1 Track Playback
5		All Tracks Playback
6		Reception Notification
7		Reception Priority
8		Earphones
9		Earphones + SP
10		Battery Power Level 0
11		Battery Power Level 1
12		Battery Power Level 2
13		Battery Power Level 3
14		Extremely Weak
15		Weak
16		Medium
17		Strong
18		Train Mode
19	Use unique design by each remocon manufacturer.	Manner Mode (M)
20	Use unique design by each remocon manufacturer.	Unchecked Arrival Alert (!)

