

## PROGRAMMING THE REMOTE CONTROL

The provided universal remote control can be programmed to operate most remote-controllable devices. Note that the remote may not control all models of other brands.

### Programming a code into a remote mode

- 1** To find out whether your remote control can operate each device without programming, turn on the device (such as a VCR) and press the corresponding mode button on the remote. After that, press the **POWER** button. If the device is turned off and it responds properly the remote control need not be programmed. If not, the remote should be programmed to operate the device. The programming procedures are explained below.
- 2** Press the **MENU** and **MUTE** button continuously at the same time for two seconds; the currently selected device button is illuminated. If you don't press any button for 20 seconds, the light on the mode button will be turned off. In that case, you have to repeat from step 2.
- 3** Enter the appropriate code from the code table on the following pages. When pressing the button, the light blinks at a time. If the device turned off, the programming is successful.
- 4** Press the **MENU** button to store the code. After blinking twice, this code is stored.
- 5** Test the remote control functions to see if the device responds properly. If not, steps 2-5.

# Remote Control Code

## VCR

Brand	Codes	Brand	Codes	Brand	Codes
AIWA	034	MAGNAVOX	031 033 034 041	SAMSUNG	032 040 102 104
AKAI	016 043 046 124		067 068		105 107 109 112
	125 146	MARANTZ	012 031 033 067		113 115 120 122
AMPRO	072		069		125
ANAM	031 033 103	MARTA	101	SANSUI	022 043 048 135
AUDIO DYNAMICS	012 023 039 043	MATSUI	027 030	SANYO	003 007 010 014
BROKSONIC	035 037 129	MEI	031 033		102 134
CANON	028 031 033	MEMOREX	003 010 014 031	SCOTT	017 037 112 129
CAPEHART	108		033 034 053 072		131
CRAIG	003 040 135		101 102 134 139	SEARS	003 008 009 010
CURTIS MATHES	031 033 041	MGA	045 046 059		013 014 017 020
DAEWOO	005 007 010 064	MINOLTA	013 020		031 042 073 081
	065 108 110 111	MITSUBISHI	013 020 045 046		101
	112 116 117 119		049 051 059 061	SHARP	031 054 149
DAYTRON	108		151	SHINTOM	024
DBX	012 023 039 043	MTC	034 040	SONY	003 009 031 052
DYNATECH	034 053	MULTITECH	024 034		056 057 058 076
ELECTROHOME	059	NEC	012 023 039 043		077 078 149
EMERSON	006 017 025 027		048	SOUNDESIGN	034
	029 031 034 035	NORDMENDE	043	STS	013
	036 037 046 101	OPTONICA	053 054	SYLVANIA	031 033 034 059
	129 131 138 153	PANASONIC	066 070 074 083		067
FISHER	003 008 009 010		133 140 145	SYMPHONIC	034
FUNAI	034			TANDY	010 034
GE	031 033 063 072	PENTAX	013 020 031 033	TATUNG	039 043
	107 109 144 147		063	TEAC	034 039 043
GO VIDEO	132 136	PHILCO	031 034 067	TECHNICS	031 033 070
HARMAN KARDON	012 045	PHILIPS	031 033 034 054	TEKNIKA	019 031 033 034
HITACHI	004 018 026 034		067 071 101		101
	043 063 137 150	PILOT	101	THOMAS	034
INSTANTREPLAY	031 033	PIONEER	013 021 048	TMK	006
JCL	031 033	PORTLAND	108	TOSHIBA	008 013 042 047
JCPENNY	012 013 015 033	PULSAR	072		059 082 112 131
	040 066 101	QUARTZ	011 014	TOTEVISION	040 101
JENSEN	043	QUASAR	033 066 075 145	UNITECH	040
JVC	012 031 033 043	RCA	013 020 033 034	VECTOR RESEARCH	012
	048 050 055 060		040 041 062 063	VICTOR	048
	130 150 152		107 109 140 144	VIDEO CONCEPTS	012 034 046
KENWOOD	014 034 039 043		145 147	VIDEOSONIC	040
	047 048	REALISTIC	003 008 010 014	WARDS	003 013 017 024
LG (GOLDSTAR)	001 012 013 020		031 033 034 040		031 033 034 040
	101 106 114 123		053 054 101		053 054 131
LLOYD	034	RICO	058	YAMAHA	012 034 039 043
LXI	003 009 013 014	RUNCO	148	ZENITH	034 048 056
	017 034 101 106	SALORA	014		058 072 080 101
MAGIN	040				

# APPENDIX

## Cable Box

Brand	Codes	Brand	Codes	Brand	Codes
ABC	003 004 039 042 046 052 053	LG (GOLDSTAR)	074 001 106 101 005	REMBRANT	025
AJIN	112	M-NET	037	SAMSUNG	102 107 030 068
ANTRONIK	014	MACOM	033	SCIENTIFIC ATLANTA	003 011 041 042 043 045 046
ARCHER	005 007 014 024	MAGNAVOX	010 012 064 079	SHERITECH	022
CABLE STAR	026	MEMOREX	100	SIGNAL	030
CENTURION	092	MOVIE TIME	028 032	SIGNATURE	052
CENTURY	007	NSC	015 028 038 071 073	SL MARX	030
CITIZEN	007	OAK	016 031 037 053	SPRUCER	047 078
COLOUR VOICE	065 090	PANASONIC	044 047	STARCOM	002 004 008 009
COMBANO	080 081	PARAGON	100	STARGATE	008 030
COMTRONICS	019 030	PHILIPS	006 012 013 020 065 085 090	TADIRAN	030
DIAMOND	023	PIONEER	034 051 052 063 076	TAEKWANG	110
EAGLE	020 030 040	POST NEWS WEEK	016	TAIHAN	105
EASTERN	057 062 066	PRUCER	059	TANDY	017
ELECTRICORD	032	PTS	011 048 071 072 073 074	TEXSCAN	029
GE	072	PULSAR	100	TOCOM	039 040 056
GEMINI	008 022 025 054	RCA	047	TOSHIBA	100
GI	052 074	REGAL	049 050	UNIKA	007 014 024
GOLDEN CHANNEL	030	REGENCY	057	UNITED CABLE	004 053
HAMLIN	049 050 055			UNIVERSAL	005 007 014 024 026 027 032 035
HITACHI	052 055			VIEWSTAR	012 015 018 086 087 088 089
HOSPITALITY	070 077			ZENITH	100 114 060 093
JERROLD	002 003 004 008 009 010 052 069				

## HDSTB

Brand	Codes	Brand	Codes	Brand	Codes
ALPHASTAR DSR	123	HOUSTON TRACKER	033 037 039 051	PROSAT	072
AMPLICA	050	HUGHES	057 104	RCA	066 106
BIRDVIEW	051 126 129	JANIEL	068	REALISTIC	043 074
CHANNEL MASTER	013 014 015 018 036 055	JERROLD	060 147 061	SAMSUNG	123
CHAPARRAL	008 009 012 077	KATHREIN	108	SATELLITE SERVICE CO	028 035 047 057 085
CITOH	054	LEGEND	057	SCIENTIFIC ATLANTA	032 138
CURTIS MATHES	050 145	LG	001	SONY	103
DRAKE	005 006 007 010 011 052 112 116 141	LUTRON	132	STARCAST	041
DX ANTENNA	024 046 056 076	LUXOR	062 144	SUPER GUIDE	020 124 125
ECHOSTAR	038 040 057 058 093 094 095 096 097 098 099 100 122	MACOM	010 059 063 064 065	TEECOM	023 026 075 087 088 090 107 130 137
ELECTRO HOME	089	MEMOREX	057	TOSHIBA	002 127
EUROPLUS	114	NEXTWAVE	028 124 125	UNIDEN	016 025 042 043 044 045 048 049 078 079 080 086 101 135 136
FUJITSU	017 021 022 027 133 134	NORSAT	069 070	VIEWSTAR	115
GENERAL INSTRUMENT	003 004 016 029 031 059 101	PACE SKY SATELLITE	143	WINEGARD	128 146
HITACHI	139 140	PANASONIC	060 142	ZENITH	081 082 083 084 091 120
		PANSAT	121		
		PERSONAL CABLE	117		
		PHILIPS	071		
		PICO	105		
		PRESIDENT	019 102		
		PRIMESTAR	030 110 111		

## Audio

Brand	Codes	Brand	Codes	Brand	Codes
AIWA	014 028 070 096 125 129 139 229 230		157 158 159 160 189 207 222 224 225 226 227 243 247	RCX	092
AKAI	163			REALISTIC	103 106
ANAM	003 014 017 023 059 106 189 216 217 235 236	LOTTE	014 016 036 098 100 172 173 174 175 176 177 178 179 180 181 183 201 202 208 213 214 219 223 232 238 240	SAMSUNG	124 145 146 182 193 194 195 203 204 244 245 246
BURMECTER	252			SANSUI	011 135 138 144
CARVER	086			SANYO	019 083 234
CLARION	199			SCOTT	106 186
DAEWOO	027 053 060 084 102 148 198 221	LXI	103	SHARP	031 032 051 052 072 082 117 119 156 184 199 200 206 209
DENON	015 075 130 143	MAGNAVOX	111	SHERWOOD	005 006 158
FANTASIA	071	MARANTZ	002 018 020 025 034 041 081 090 097 112	SONY	044 045 109 114 118 126 248 249
FINEARTS	022			TAEKWANG	012 020 073 074 076 077 105 161 162 163 164 165 166 167 168 169 205 231 233 242
FISHER	089 099	MCINTOSH	049		
LG(GOLDSTAR)	001 021 024 029 087 107 108 110 190 191 192 210 211 212 239	MCS	104		
		MEMOREX	107		
HAITAI	034 035 188 222	NAD	046		
HARMAN/KARDON	068	ONKYO	013 040 041 047 048 056 057 132 133 140	TEAC	010 085 106 136 185 187 237
JVC	004 013 141			TECHNICS	101 113 128 134 147 218
KEC	185 186 187	OPTIMUS	158	TOSHIBA	137
KOHEL	030	PANASONIC	007 033 064 113 142 220 241 251	THE	061
NAD	045 046	PENNEY	104	VICTOR	088 131
KENWOOD	038 050 067 089 170 171 197 206 215 222	PHILIPS	026 112 143	WARDS	089
		PIONEER	039 042 043 063 065 091 093 094 115 123 127 250	YAMAHA	054 055 066 092 199
INKEL	037 058 062 069 078 079 095 121 122 149 150 151 152 153 154 155	QUASAR	113		
		RCA	080		

## DVD

Brand	Codes	Brand	Codes	Brand	Codes
APEX DIGITAL	022	MITSUBISHI	002	RCA	005 006
DENON	020 014	NAD	023	SAMSUNG	011 015
GE	005 006	ONKYO	008 017	SONY	007
HARMAN KARDON	027	PANASONIC	003 009	THOMPSON	005 006
JVC	012	PHILIPS	013	TOSHIBA	019 008
LG	001 010 016 025	PIONEER	004 026	YAMAHA	009 018
MAGNAVOX	013	PROCEED	021	ZENITH	010 016 025
MARANTZ	024	PROSCAN	005 006		

## IR CODES

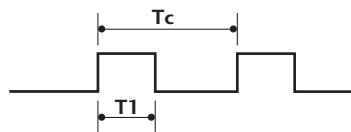
### 1. How to Connect

- Connect your wired remote control to the Remote Control port on the TV.

### 2. Remote Control IR Codes

#### ■ Output waveform

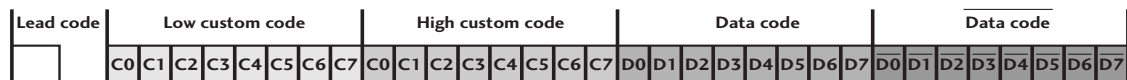
Single pulse, modulated with 37.917KHz signal at 455KHz



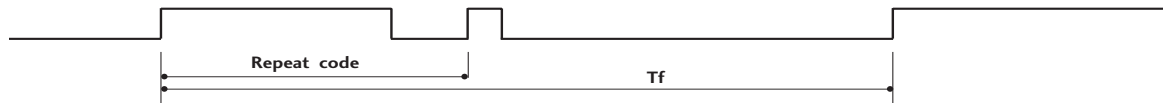
Carrier frequency  
 $FCAR = 1/T_C = f_{OSC}/12$   
 Duty ratio =  $T_1/T_C = 1/3$

#### ■ Configuration of frame

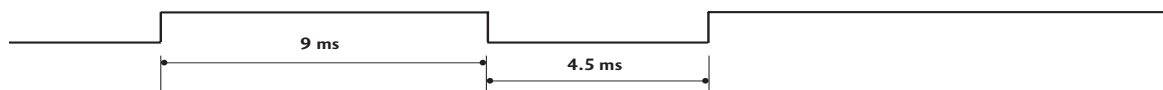
1st frame



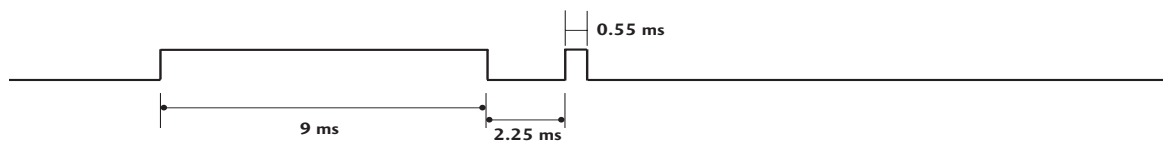
Repeat frame



#### ■ Lead code



#### ■ Repeat code

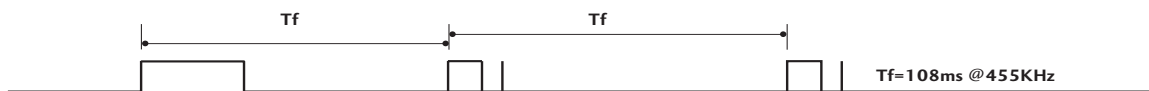


#### ■ Bit description



#### ■ Frame interval: Tf

The waveform is transmitted as long as a key is depressed.



Code (Hexa)	Function	Note	Code (Hexa)	Function	Note
0F	TV INPUT	Remote control Button	BF	COMPONENT1	Discrete IR Code
0B	INPUT	Remote control Button			(Component1 Input Selection)
08	POWER	Remote control Button (Power On/Off)	D4	COMPONENT2	Discrete IR Code
79	RATIO	Remote control Button			(Component2 Input Selection)
0E	TIMER	Remote control Button	D5	RGB-PC	Discrete IR Code
10-19	Number Key 0-9	Remote control Button			(RGB-PC Input Selection)
4C	- (Dash)	Remote control Button	CE	HDMI1/DVI	Discrete IR Code
1A	BACK	Remote control Button			(HDMI1/DVI Input Selection)
09	MUTE	Remote control Button	CC	HDMI2	Discrete IR Code
02	VOL ▲	Remote control Button			(HDMI2 Input Selection)
03	VOL ▼	Remote control Button	76	Ratio 4:3	Discrete IR Code
00	CH ▲	Remote control Button			(Only 4:3 Mode)
01	CH ▼	Remote control Button	77	Ratio 16:9	Discrete IR Code
1E	FAV	Remote control Button			(Only 16:9 Mode)
7E	SIMPLINK	Remote control Button	AF	Ratio Zoom	Discrete IR Code
39	CC	Remote control Button			(Only Zoom1 Mode)
40	▲	Remote control Button			
41	▼	Remote control Button			
07	◀	Remote control Button			
06	▶	Remote control Button			
44	ENTER	Remote control Button			
43	MENU	Remote control Button			
52	SOUND	Remote control Button			
4D	PICTURE	Remote control Button			
5B	EXIT	Remote control Button			
0A	SAP	Remote control Button			
CB	ADJUST	Remote control Button			
E1	BRIGHT -	Remote control Button			
E0	BRIGHT +	Remote control Button			
D6	TV	Discrete IR Code			
		(TV Input Selection)			
C4	POWER ON	Discrete IR Code			
		(Only Power On)			
C5	POWER OFF	Discrete IR Code			
		(Only Power Off)			
5A	AV1	Discrete IR Code			
		(AV1 Input Selection)			
D0	AV2	Discrete IR Code			
		(AV2 Input Selection)			

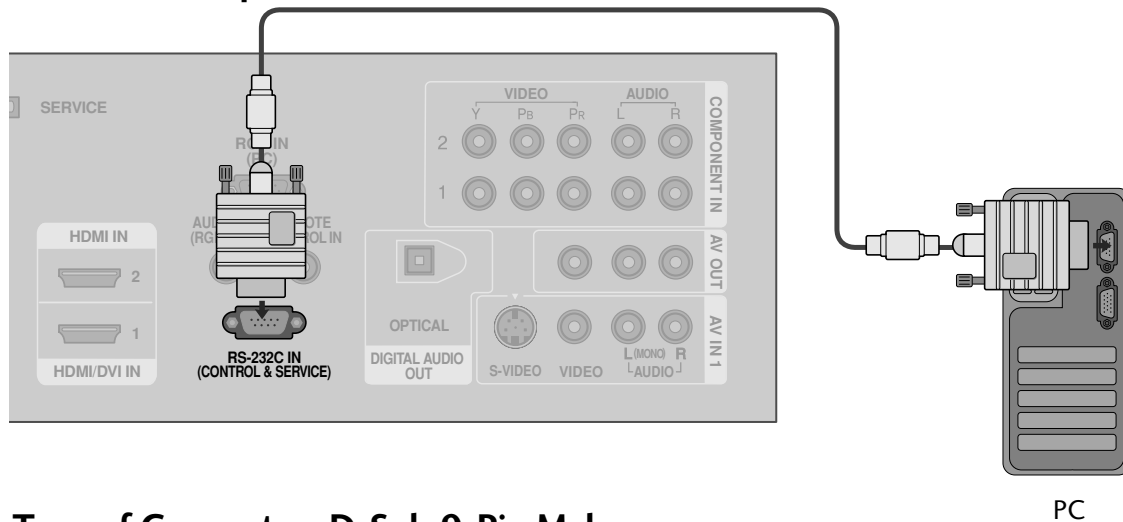
# APPENDIX

## EXTERNAL CONTROL THROUGH RS-232C

The RS-232C port allows you connect the RS-232C input jack to an external control device (such as a computer or an A/V control system) to control the TV's functions externally.

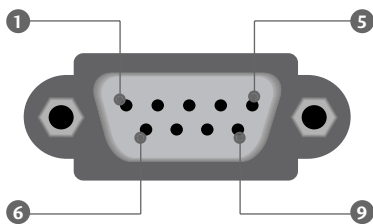
- Note: RS-232C on this unit is intended to be used with third party RS-232 control hardware and software. The instructions below are provided to help with programming software or to test functionality using telenet software.

### RS-232C Setup



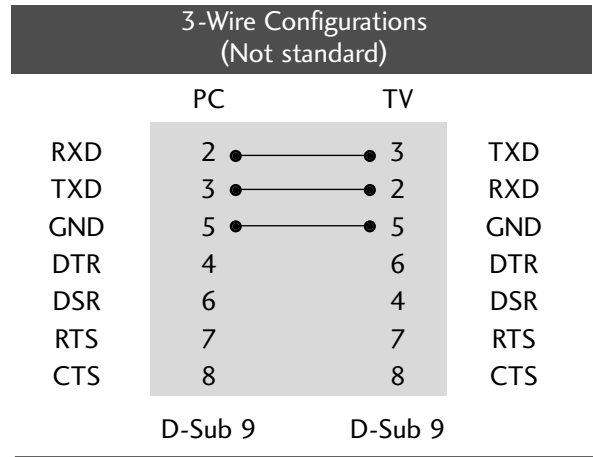
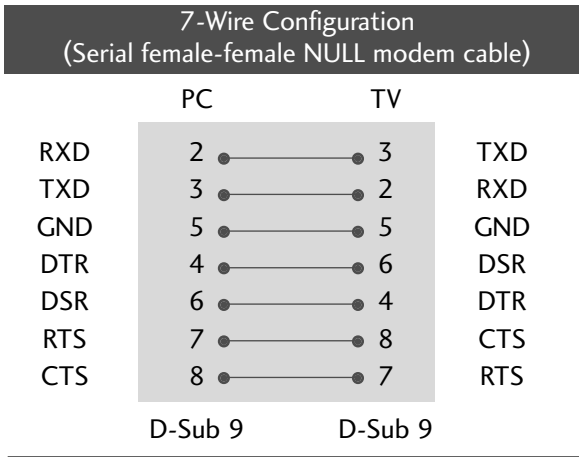
### Type of Connector; D-Sub 9-Pin Male

No.	Pin Name
1	No connection
2	RXD (Receive data)
3	TXD (Transmit data)
4	DTR (DTE side ready)
5	GND
6	DSR (DCE side ready)
7	RTS (Ready to send)
8	CTS (Clear to send)
9	No Connection



## RS-232C Configurations

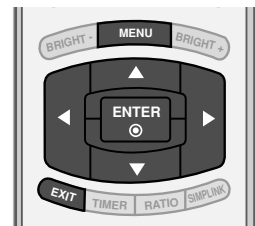
Either cable below can be used.



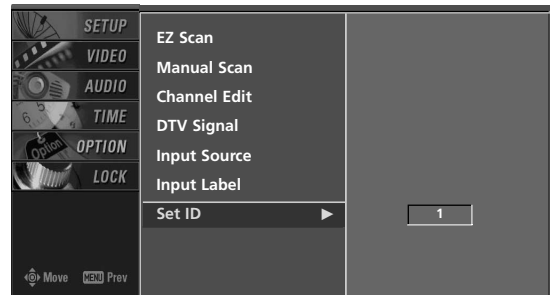
## Set ID

Use this function to specify a TV ID number.  
Refer to 'Real Data Mapping'. ▶ p.89.

- 1 Press the **MENU** button and then use ▲ or ▼ button to select the **SETUP** menu.
- 2 Press the ► button and then use ▲ or ▼ button to select **Set ID**.
- 3 Press the ► button and then use ▲ or ▼ button to adjust **Set ID** to choose the desired TV ID number.  
The adjustment range of Set ID is 1~99.
- 4 Press **EXIT** button to return to TV viewing or press **MENU** button to return to the previous menu.



1



2 3

## Communication Parameters

- Baud rate : 9600 bps (UART)
- Data length : 8 bits
- Parity : None
- Stop bit : 1 bit
- Communication code : ASCII code
- Use a crossed (reverse) cable.

**NOTE** ▶ This product has command echo back in the RS-232C Command.



## Command Reference List

	COMMAND1	COMMAND2	DATA (Hexadecimal)		COMMAND1	COMMAND2	DATA (Hexadecimal)
01. Power	k	a	0 ~ 1	11. Sharpness	k	k	0 ~ 64
02. Input Select	k	b	0 ~ 9	12. OSD Select	k	l	0 ~ 1
03. Aspect Ratio	k	c	(▶ p.89)	13. Remote Control Lock Mode	k	m	0 ~ 1
04. Screen Mute	k	d	0 ~ 1	14. Treble	k	r	0 ~ 64
05. Volume Mute	k	e	0 ~ 1	15. Bass	k	s	0 ~ 64
06. Volume Control	k	f	0 ~ 64	16. Balance	k	t	0 ~ 64
07. Contrast	k	g	0 ~ 64	17. Color Temperature	k	u	0 ~ 3
08. Brightness	k	h	0 ~ 64	18. ISM Method	j	p	(▶ p.90)
09. Color	k	i	0 ~ 64	19. Low Power	j	q	0 ~ 1
10. Tint	k	j	0 ~ 64				

Plasma TV Model Only

	COMMAND1	COMMAND2	DATA0 (Hexadecimal)	DATA1 (Hexadecimal)	DATA2 (Hexadecimal)	DATA3 (Hexadecimal)	DATA4 (Hexadecimal)	DATA5 (Hexadecimal)
20. Channel Tuning	m	a	physical program high	major program low	major low	minor high	minor low	attribute
21. Channel Add/Del	m	b	0 ~ 1					
22. Key	m	c	(▶ p.91)					
23. Input Select	x	b	(▶ p.91)					

## Transmission / Receiving Protocol

### Transmission

[Command1][Command2][ ][Set ID][ ][Data][Cr]

[Command 1] : First command to control the set.(j, k, m or x)

[Command 2] : Second command to control the set.

[Set ID] : You can adjust the set ID to choose desired TV ID number in Setup menu. Adjustment range is 1 ~ 99. When selecting Set ID '0', every connected the TV is controlled. Set ID is indicated as decimal (1 ~ 99) on menu and as Hexa decimal (0x0~ 0x63) on transmission /receiving protocol.

[DATA] : To transmit command data.

Transmit 'FF' data to read status of command.

\* In this model, TV will not send the status during the standby mode.

[Cr] : Carriage Return

ASCII code '0x0D'

[ ] : ASCII code 'space (0x20)'

### OK Acknowledgement

[Command2][ ][Set ID][ ][OK][Data][x]

The TV transmits ACK (acknowledgement) based on this format when receiving normal data. At this time, if the data is data read mode, it indicates present status data. If the data is data write mode, it returns the data of the PC computer.

\* In this model, TV will not send the status during the standby mode.

\* Data Format

[Command 2] : Use as command.

[Set ID] : Use the small character, if set ID is 10, it will send the '0', 'a'.

[DATA] : Use the small character, if data is 0 x ab, it will send the 'a', 'b'.

[OK] : Use the large character.

\* In this model, TV will send the echo, CR, LF with acknowledgement message.

\* When it send the power on acknowledgement message, it will be like below.

ex) ka 01 01 (CR) (LF) a 01 OK 01 x (CR) (LF)

### Error Acknowledgement

[Command2][ ][Set ID][ ][NG][Data][x]

The TV transmits ACK (acknowledgement) based on this format when receiving abnormal data from non-viable functions or communication errors.

Data1: Illegal Code

Data2: Not supported function

Data3: Wait more time

\* In this model, TV will not send the status during the standby mode.

\* Data Format

[Command 2] : Use as command.

[Set ID] : Use the small character, if set ID is 10, it will send the '0', 'a'.

[DATA] : Use the small character, if data is 0 x ab, it will send the 'a', 'b'.

[NG] : Use the large character

\* In this model, TV will send the echo, CR, LF with acknowledgement message.

\* When it send the power on acknowledgement message, it will be like below.

ex) ka 01 01 (CR) (LF) a 01 NG 01 x (CR) (LF)

**01. Power (Command2:a)**

To control Power On/Off of the TV.

*Transmission* [k][a][ ][Set ID][ ][Data][Cr]

Data 0 : Power Off                      Data 1 : Power On

*Acknowledgement* [a][ ][Set ID][ ][OK/NG][Data][x]

\* In a like manner, if other functions transmit 'FF' data based on this format, Acknowledgement data feedback presents status about each function.

\* In this model, TV will send the Acknowledge after power on processing completion.

\* There might be a time delay between command and acknowledgement.

**02. Input Select (Command2:b) (Main Picture Input)**

To select input source for the TV.

*Transmission* [k][b][ ][Set ID][ ][Data][Cr]

Data 0: DTV                                  Data 5: Component 2

Data 1: Analog                              Data 7: RGB-PC

Data 2: AV1                                  Data 8: HDMI1/DVI

Data 3: AV2                                  Data 9: HDMI2

Data 4: Component 1

*Acknowledgement* [b][ ][Set ID][ ][OK/NG][Data][x]

**03. Aspect Ratio (Command2:c) (Main picture format)**

To adjust the screen format.

You can also adjust the screen format using the RATIO button on remote control or in the Option menu.

*Transmission* [k][c][ ][Set ID][ ][Data][Cr]

Date 1: 4:3                                      5: Zoom 2

2: 16:9                                         6: Set by program

3: Horizon

4: Zoom 1

*Acknowledgement* [c][ ][Set ID][ ][OK/NG][Data][x]

**04. Screen Mute (Command2:d)**

To select screen mute on/off.

*Transmission* [k][d][ ][Set ID][ ][Data][Cr]

Data 0 : Screen mute off (Picture on)

Data 1 : Screen mute on (Picture off)

*Acknowledgement* [d][ ][Set ID][ ][OK/NG][Data][x]

**05. Volume Mute (Command2:e)**

To control volume mute on/off.

You can also adjust mute using the MUTE button on remote control.

*Transmission* [k][e][ ][Set ID][ ][Data][Cr]

Data 0 : Volume mute on (Volume off)

Data 1 : Volume mute off (Volume on)

*Acknowledgement* [e][ ][Set ID][ ][OK/NG][Data][x]

**06. Volume Control (Command2:f)**

To adjust volume.

You can also adjust volume with the volume buttons on remote control.

*Transmission* [k][f][ ][Set ID][ ][Data][Cr]

Data Min : 0 ~ Max : 64

Refer to 'Real data mapping' as shown below.

*Acknowledgement* [f][ ][Set ID][ ][OK/NG][Data][x]

**07. Contrast (Command2:g)**

To adjust screen contrast.

You can also adjust contrast in the Video menu.

*Transmission* [k][g][ ][Set ID][ ][Data][Cr]

Data Min : 0 ~ Max : 64

Refer to 'Real data mapping' as shown below.

*Acknowledgement* [g][ ][Set ID][ ][OK/NG][Data][x]

**08. Brightness (Command2:h)**

To adjust screen brightness.

You can also adjust brightness in the Video menu.

*Transmission* [k][h][ ][Set ID][ ][Data][Cr]

Data Min : 0 ~ Max : 64(\*transmit by Hexadecimal code)

Refer to 'Real data mapping' as shown below.

*Acknowledgement* [h][ ][Set ID][ ][OK/NG][Data][x]

**09. Color (Command2:i)**

To adjust the screen color.

You can also adjust color in the Video menu.

*Transmission* [k][i][ ][Set ID][ ][Data][Cr]

Data Min : 0 ~ Max : 64

Refer to 'Real data mapping' as shown below.

*Acknowledgement* [i][ ][Set ID][ ][OK/NG][Data][x]

\*Real data mapping

0 : Step 0

⋮

A : Step 10 (SET ID 10)

⋮

F : Step 15 (SET ID 15)

10 : Step 16 (SET ID 16)

⋮

63 : Step 99 (SET ID 99)

64 : Step 100

\* Tint : R50 ~ G50

\* Balance : L50 ~ R50

## 10. Tint (Command2:j)

To adjust the screen tint.

You can also adjust tint in the Video menu.

*Transmission* [k][j][ ][Set ID][ ][Data][Cr]

Data Red : 0 ~ Green : 64

\*Refer to 'Real data mapping': ► p.89.

*Acknowledgement* [j][ ][Set ID][ ][OK/NG][Data][x]

## 11. Sharpness (Command2:k)

To adjust the screen sharpness.

You can also adjust sharpness in the Video menu.

*Transmission* [k][k][ ][Set ID][ ][Data][Cr]

Data Min: 0 ~ Max: 64

\*Refer to 'Real data mapping': ► p.89.

*Acknowledgement* [k][ ][Set ID][ ][OK/NG][Data][x]

## 12. OSD Select (Command2:l)

To select OSD (On Screen Display) on/off.

*Transmission* [k][l][ ][Set ID][ ][Data][Cr]

Data 0: OSD off                      Data 1: OSD on

*Acknowledgement* [l][ ][Set ID][ ][OK/NG][Data][x]

## 13. Remote Control Lock Mode (Command2:m)

To lock the remote control and the front panel controls on the set.

*Transmission* [k][m][ ][Set ID][ ][Data][Cr]

Data 0: Lock off                      Data 1: Lock on

*Acknowledgement* [m][ ][Set ID][ ][OK/NG][Data][x]

If you're not using the remote control and front panel controls on the TV, use this mode. When main power is on/off, remote control lock is released.

## 14. Treble (Command2:r)

To adjust treble.

You can also adjust treble in the Audio menu.

*Transmission* [k][r][ ][Set ID][ ][Data][Cr]

Data Min: 0 ~ Max: 64(\*transmit by Hexadecimal code)

\*Refer to 'Real data mapping': ► p.89.

*Acknowledgement* [r][ ][Set ID][ ][OK/NG][Data][x]

## 15. Bass (Command2:s)

To adjust bass.

You can also adjust bass in the Audio menu.

*Transmission* [k][s][ ][Set ID][ ][Data][Cr]

Data Min: 0 ~ Max: 64(\*transmit by Hexadecimal code)

\*Refer to 'Real data mapping': ► p.89.

*Acknowledgement* [s][ ][Set ID][ ][OK/NG][Data][x]

## 16. Balance (Command2:t)

To adjust balance.

You can also adjust balance in the Audio menu.

*Transmission* [k][t][ ][Set ID][ ][Data][Cr]

Data Min: 0 ~ Max: 64(\*transmit by Hexadecimal code)

\*Refer to 'Real data mapping': ► p.89.

*Acknowledgement* [t][ ][Set ID][ ][OK/NG][Data][x]

## 17. Color Temperature (Command2:u)

To adjust color temperature.

You can also adjust color temperature in the Video menu.

*Transmission* [k][u][ ][Set ID][ ][Data][Cr]

Data 0: Medium    1: Cool    2: Warm    3: User

*Acknowledgement* [u][ ][Set ID][ ][OK/NG][Data][x]

## 18. ISM Method (Command2:p)

To avoid having a fixed image remain on screen.

(This feature is not available for all models.)

*Transmission* [j][p][ ][Set ID][ ][Data][Cr]

Data 1: Inversion                      2: Orbiter

4: White Wash                      8: Normal

*Acknowledgement* [p][ ][Set ID][ ][OK/NG][Data][x]

## 19. Low Power (Command2:q)

To control the low power function on/off.

(This feature is not available for all models.)

*Transmission* [j][q][ ][Set ID][ ][Data][Cr]

Data 0: Low power off                      1: Low power on

*Acknowledgement* [q][ ][Set ID][ ][OK/NG][Data][x]

## 20. Channel Tuning (Command: m a)

To tune channel to following physical/major/minor number.

*Transmission* [m][a][ ][Set ID][ ][Data0][ ][Data1]

[ ][Data2][ ][Data3][ ][Data4][ ][Data5][Cr]

Digital channels have a Physical, Major, and Minor channel number. The Physical number is the actual digital channel number, the Major is the number that the channel should be mapped to, and the Minor is the sub-channel. Since the ATSC tuner automatically maps the channel to the Major number, the Physical number is not required when sending a command.

Data 0: Physical Channel Number

NTSC air: 02~45, NTSC cable: 01, 0E~7D

ATSC air: 01~45, ATSC cable: 01~87

Data1 & 2: Major Channel Number

Data1: High byte                      Data2: Low byte

Two bytes are available for the Major and Minor, normally only the second byte is used.

Data3 & 4: Minor Channel Number

Not needed for NTSC.

Data5:

7	Main/Sub Picture	6	Two/One Part Channel	5	Using Physical Channel	4	Reserved	3	2	1	0	Step
0	Main	0	Two	0	Use	x		0	0	0	0	NTSC Air
1		1	One	1	No Use	x		0	0	0	1	NTSC Cable
						x		0	0	1	0	ATSC Air
						x		0	0	1	1	ATSC Cable_std
						x		0	1	0	0	ATSC Cable_hrc
						x		0	1	0	1	ATSC Cable_irc
						x		0	1	1	0	ATSC cable_auto
						x		0	1	1	1	Reserved
						x		x	x	x	x	-
						x		1	1	1	1	Reserved

The table above lists the binary code which must be converted to Hexadecimal before sending. For example: The binary code to tune the sub source to an NTSC cable channel is "1000 0001", which translates to "81" in Hex.

- \* 7th bit : For which source do you want to change the channel.
  - \* 6th bit: Use a two part or one part channel. Most cases just use 0 since it's ignored when using NTSC.
  - \* 5th bit: Use 0 with NTSC since it can only use the physical channel number. Normally use 1 for ATSC since most times it doesn't matter what the physical number is.
  - \* 4th bit: Set to 0.
  - \* 3-0 bits: Choose signal type.
- \* Tune Command Examples:
1. Tune to the analog (NTSC) cable channel 35.
    - Data 0 = Physical of 35 = 23
    - Data 1 & 2 = No Major = 00 00
    - Data 3 & 4 = No Minor = 00 00
    - Data 5 = 0000 0001 in binary = 01
    - Total = ma 00 23 00 00 00 01
  2. Tune to the digital (ATSC) local channel 30-3.
    - Data 0 = Don't know Physical = 00
    - Data 1 & 2 = Major is 30 = 00 1E
    - Data 3 & 4 = Minor is 3 = 00 03
    - Data 5 = 0010 0010 in binary = 22
    - Total = ma 00 00 00 1E 00 03 22

```
Acknowledgement[a][ ][Set ID][ ][OK][Data0][Data1]
[Data2][Data3][Data4][x][a][ ][Set ID]
[ ][NG][Data0][x]
```

## 21. Channel Add/Del (Command: m b)

To add and delete the channels

```
Transmission [m][b][ ][Set ID][ ][Data][Cr]
```

Data 0: Channel Delete      Data 1: Channel Add

```
Acknowledgement [b][ ][Set ID][ ][OK/NG][Data][x]
```

## 22. Key (Command: m c)

To send IR remote key code.

```
Transmission [m][c][ ][Set ID][ ][Data][Cr]
```

Data Key code: Refer to page 85.

```
Acknowledgement [c][ ][Set ID][ ][OK/NG][Data][x]
```

## 23. Input select(Command: x b) (Main Picture Input)

To select input source for TV.

```
Transmission [x][b][ ][Set ID][ ][Data][Cr]
```

Data 00 : DTV (Antenna)      Data 40 : Component 1

Data 01 : DTV (Cable)      Data 41 : Component 2

Data 10 : Analog (Antenna)      Data 60 : RGB PC

Data 11 : Analog (Cable)      Data 90 : HDMI1/DVI

Data 20 : AV1      Data 91 : HDMI2

Data 21 : AV2

```
Acknowledgement [b][ ][Set ID][ ][OK/NG][Data][x]
```