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Transfer Method of Video ID information using Vertical Blanking Interval (525 line System)

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Transfer Method of Video ID information using Vertical Blanking Interval (525 line System)

1. Applicable scope This report concerns the 525 line picture signal. Different Aspect ratio signals exist, related to this information and if other types of information exist, connect them through the picture terminal, adopt the transmission method and identification signal. Picture signal source is mainly package-type media.

2. Term Definition

(1) **VBI** VBI stands for the Vertical Blanking Interval. In this report, the term used will be luminance signal vertical blanking interval.

(2) **Squeeze (or Full screen mode) signal** 525 line signal that is above the aspect ratio of 4:3 for the standard television, using the signal type of 525 line, or aspect ratio 16:9 picture information.

(3) **Aspect ratio 4:3 letter box signal** Wide screen picture signal that on 525 line, aspect ratio 4:3, exists at the top and bottom blank screen. The main viewing part of the screen has an aspect ratio of 16:9 (53~232/316~495).

(4) **3D information** Three-dimensional display mode and its related signal type information.

(5) **Pulldown information** Information that identifies the picture from each frame from the 24 frame movie or 30 frame CM film.

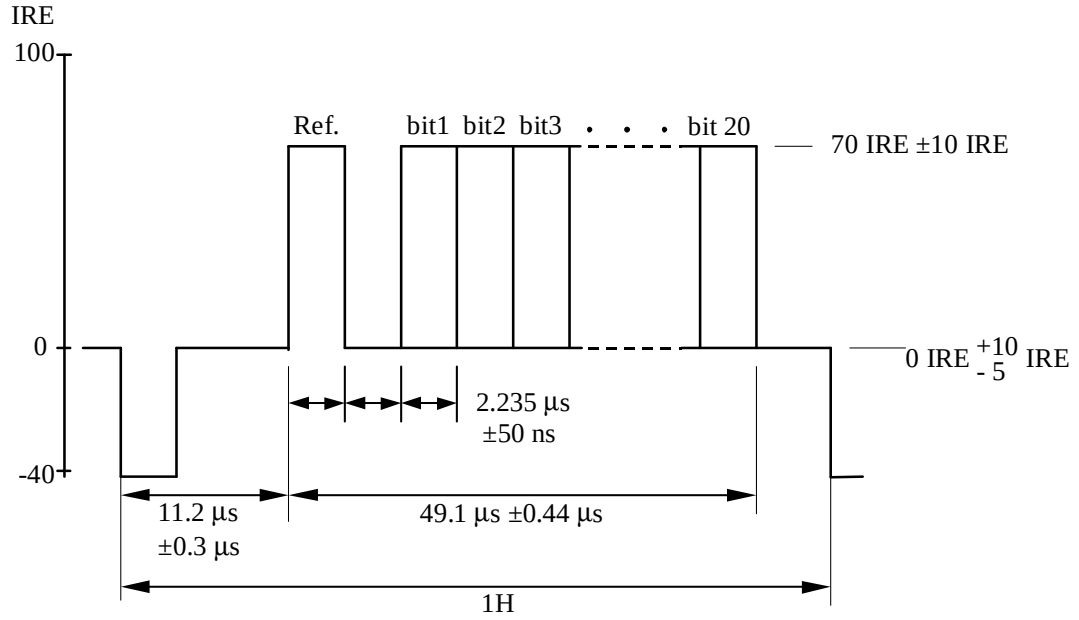
(6) **Header information** VTR starting position and multiple index information.

3. Transfer method and identification signal structure Luminance signal vertical blanking interval's 20^{th} line and 283^{rd} line delineate the valid picture part, distributing the 20 bits of digital signal that are displayed by the 70 IRE reference signal and the 70 IRE or 0 IRE amplitude. This 20 bits of digital signal is used as an identification signal, encoding and transmitting the signal. It transmits the same information to the 20^{th} line and 283^{rd} line.

The clock frequency is fc, where fc = fsc/8 = 447 kHz.

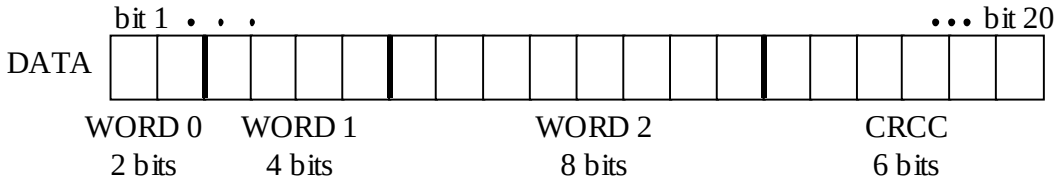
Waveform is shown in diagram 1.
Ref startup to each bit cumulative time difference should be less than 0.44μs.

Diagram 1 - Identification signal frequency



4. Identification code distribution

The 20 bits of data are structured as WORD 0 = 2 bits, WORD 1 = 4 bits, WORD 2 = 8 bits, and CRCC = 6 bits (for WORD 2, display from MSB bit 14 ~ LSB bit 7).



4.1 WORD 0 = Aspect ratio related information

WORD 0		CONTENT
bit 1	bit 2	
0	0	Aspect ratio 4:3 screen signal or no information
1	0	Aspect ratio 16:9 screen squeeze signal
0	1	Aspect ratio 4:3 letter box signal
1	1	No used.

4.2 WORD1 = 16 values of header display information when transmitting WORD2

	bit No. 3 4 5 6	Content of transmission of WORD2	Data Type
WORD 1	0000	Used by others	
	0001	Recorded year, month, date, day of week	Diagram 1
	0010	Recorded hour, minute, second	Diagram 2
	0011	Soft length, time left	Diagram 3
	0100	3D information	Diagram 5
	0101	Source information	Diagram 6
	0110	Signal type	Diagram 8
	0111	Package ID	Diagram 10
	1000	Character information (category)	Refer additional report
	1001	Character information (upper data)	
	1010	Character information (lower data)	
	1011	Not determined	
	1100	Not determined	
	1101	Not determined	
	1110	Not determined	
	1111	No information	All “0”

* When continuously transmitting the same type of information, it is shown as the divided line, transmits the other type of information (but the divided line is not for the information that ends with one frame). When there is no information to transmit, transmit “No information”.

4.3 Check the specified WORD 2 = WORD1 index

4.3.1 WORD 1 = 0 0 0 1 Transmit the recorded date, day of the week, month and year every 3 frames continuously.

Diagram 1

WORD 1	bit 14 MSB	WORD 2						bit 7 LSB
0001 1st frame	1	1			Date			
0001 2nd frame	Day	of	week			Month		
0001 3rd frame				Year				

Date: 01~31 (BCD code) 3F (all “1”) is no information

Day of the week:	000 = Sunday	100 = Thursday
	001 = Monday	101 = Friday
	010 = Tuesday	110 = Saturday
	011 = Wednesday	111 = no information
Month:	01~12 (BCD code)	1F (all"1") no information
Year:	Last two digit of year	
	00~99 (BCD code)	1F (all"1" no information

4.3.2 WORD 1 = 0 0 1 0 Transmit the recorded time in seconds, minutes, and hour every 3 frames continuously.

Diagram 2

WORD 1	bit 14 MSB	WORD 2						bit 7 LSB
0010 1st frame	1				Seconds			
0010 2nd frame	1				Minutes			
0010 3rd frame	1	1			Hour			

Seconds:	00~59(BCD code)	7F(all "1") no information
Minute:	00~59(BCD code)	7F(all "1") no information
Hour:	00~23(BCD code)	3F(all "1") no information

* When transmitting this information, transmit the information (WORD1 = 0001~0010) at a minimum of every 2 seconds, transmit the information twice.

4.3.3 WORD 1 = 0 0 1 1 Soft length, time left Transmit in the order of Soft length (minutes, hour), time left (minutes, hour) every 4 frames continuously. When transmitting the time left in seconds, transmit every 5 frames continuously.

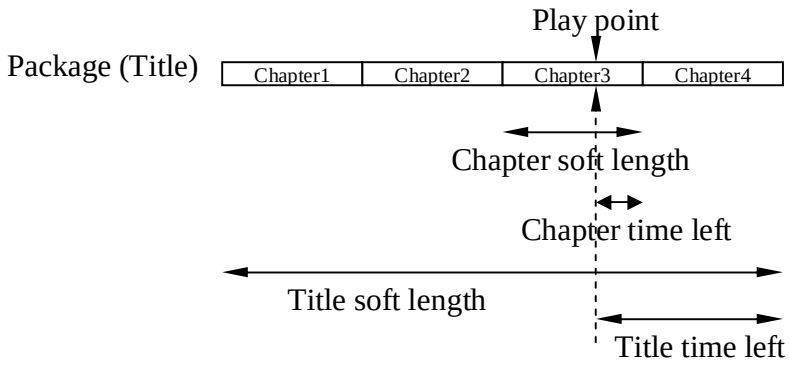
Diagram 3

WORD 1	bit 14 MSB			WORD	2			bit 7 LSB
0011 1st frame	T/C			Soft	length	(minutes)		
0011 2nd frame	T/C	1		Soft	length	(hours)		
0011 3rd frame	T/C			Time	left	(minutes)		
0011 4th frame	T/C			Time	left	(hours)		
0011 5th frame	T/C	1		Time	left	(seconds)	option	

T/C : Title/Chapter

Diagram 4

bit No.	"1"	"0"	Flag content
14	Complete title	In chapter	Hierarchy



Second :	00~59(BCD code)	7F(all "1") no information
Minute:	00~59(BCD code)	7F(all "1") no information
Hour:	00~23(BCD code)	3F(all "1") no information

* When transmitting the time left in seconds, transmit at the start of the point at which it switched over to seconds
* When transmitting this information (WORD 1 = 0011), transmit at a minimum of every 2 second transmit twice or more.

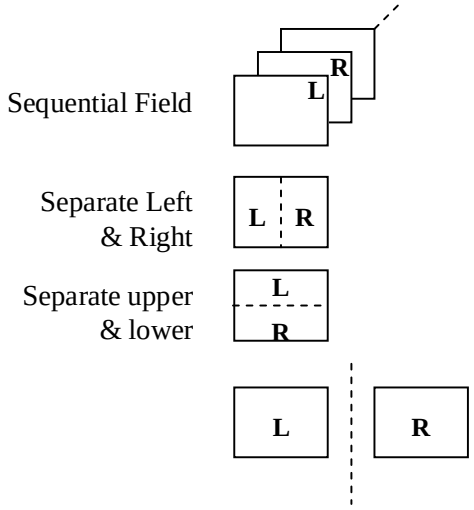
4.3.4 WORD 1 = 0 1 0 0 3D Information

Diagram 5

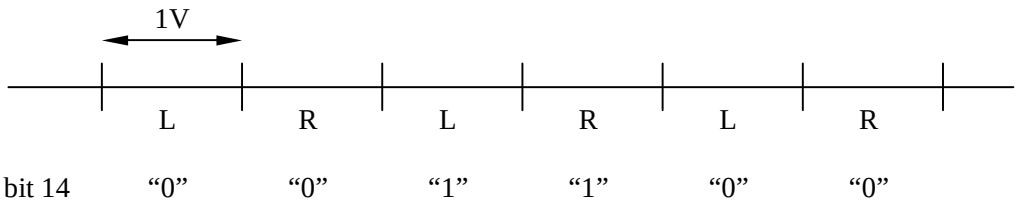
WORD 1 bit 3 4 5 6	bit 14 MSB	WORD 2						bit 7 LSB
0 1 0 0	Sync.		Undefined			3D	signal	format

3D signal format

bit9	bit8	bit7	
0	0	0	: Normal
0	0	1	: Sequential field
0	1	0	: Separate left & right
0	1	1	: Separate upper & lower
1	0	0	: Parallel L
1	0	1	: Parallel R
1	1	0	: Sequential Line
1	1	1	: Undefined



Synchronization
Field order signal, repeat “0” and “1” on every frame.
First field signified as L side when it changed.
When it is unused, “0”



* When transmitting this information (WORD 1 = 0100), it is transmitted 4 frames or more continuously, but other information is in between less than 5 frames.

* Bits 13~10 are “0”.

4.3.5 WORD 1 = 0 1 0 1 Source Information Transmit 2 frames continuously in order.

Diagram 6

WORD 1	bit 14 MSB	WORD 2						bit 7 LSB
0101 1st frame	Undef	Satellite flag	Source	code		Channel	(100's)	
0101 2nd frame	Channel,	Camera	(10's)		Channel,	Camera	(1's)	

Satellite Flag

When broadcasting satellite (includes BS, CS, digital satellite) set to "1", and others "0".

Source code and channel (100's)

bit 12					bit 7	
0	0	1	1	1	1	: Camera picture
0	1	1	1	1	1	: Line in
1	0	*	*	*	*	: Cable + Channel (100's BCD code)
1	1	*	*	*	*	: Tuner + Channel (100's BCD code)
1	1	1	1	1	0	: Pre-recorded tape

Other bit combinations are undefined.

TV channel (BCD code) : 000~999 FFF (all "1") is no information
Channel number prefers the display channel.

Camera number (BCD code) :00~99 FF (all "1") no information

Input number (BCD code) :00~99 FF (all "1") no information

* After the 2nd frame of a pre-recorded tape, transmit all "1".
* Transmitting this information (WORD 1 = 0101), at least twice or more every 2 seconds.
* Bit 14 is "0"

Transmission example

Diagram 7

WORD1 / Input	0 1 0 1 (bit 14 … bit 7)								0 1 0 1 (2nd frame)							
Camera	0	0	0	0	1	1	1	1	(10's)				(1's)			
Line	0	0	0	1	1	1	1	1	(10's)				(1's)			
Cable	0	0	1	0	(100's)				(10's)				(1's)			
Ground wave	0	0	1	1	(100's)				(10's)				(1's)			
Satellite	0	1	1	1	(100's)				(10's)				(1's)			
Pre-recorded tape	0	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1

4.3.6 WORD 1 = 0 1 1 0 Signal type

Diagram 8

WORD 1 bit 3 4 5 6	bit 14 MSB	WORD 2							bit 7 LSB
0 1 1 0		Undefined		Audio	information				

Header information

Pull-down information

Color Flag

Diagram 9

bit No.	"1"	"0"	Flag content
7	Color	B/W	Color flag
8	Continuous frame	Frame change	Pull-Down information
9	Header (VISS) signal in	Normal	Header information

Sound information :

bit 11 10

0	0	Other or no information
0	1	Mono
1	0	Dual Layer
1	1	Stereo

* When transmitting color flag and/or audio information (WORD 1=0110), transmit twice or more every 2 seconds.
  Header information (“1”) transmits continuously, transmit three times or more.
  Pulldown information transmits exposure continuously as well as changes and transmits the change of information.
  When putting the information in between the pulldown information, transmit less than one frame every second.

* Bits 14~12 are “0”

4.3.7 WORD 1 = 0 1 1 1 Package ID Transmit the package ID in order of “hardware code” and “Package ID” every 3 frames continuously.

Diagram 10

WORD 1	bit 14 MSB	WORD 2						bit 7 LSB
0111 1st frame			Hard	ware	code			
0111 2nd frame			Package	ID	(lower	8 bits)		
0111 3rd frame			Package	ID	(upper	8 bits)		

Hardware code: Number that user allocates to each piece of hardware
01h~FFh (Binary code) (set up to 255 machine)
00h is displayed under conditions of “no set up”, and each package ID is invalid. It does not require the sending of the code on the 2nd frame and 3rd frames.

Package ID: Number that interrupts every package
0001h ~ FFFFh (Binary code) (can be identified up to 65535)
0000h is no information.

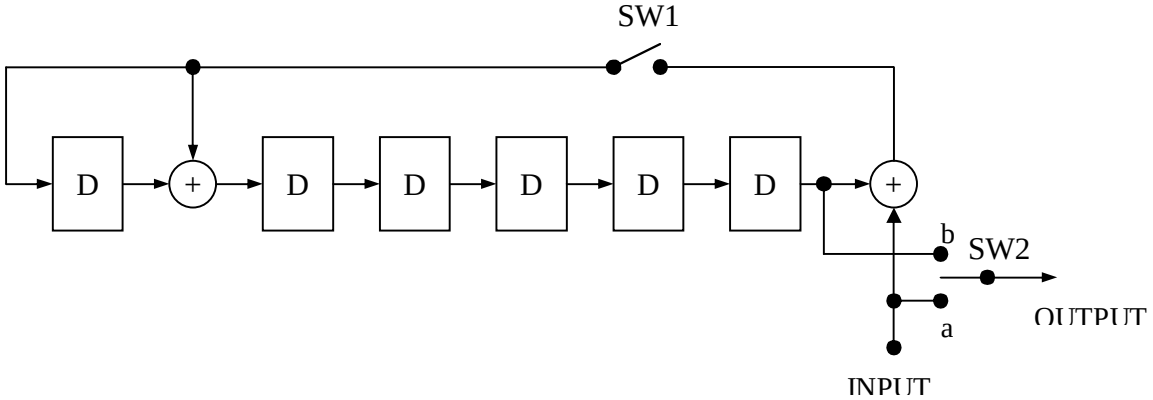
When transmitting this information (WORD 1 = 0111), transmit twice or more every 2 seconds.

4.3.8 WORD 1 =1 0 0 0 ~ 1 0 1 0 Character Information Please refer the additional reference for the transmitting of each character's information.

4.3.9 WORD 1 = 1 1 1 1 No information WORD 2 is all "0"

4.4 CRCC CRC code is the error check code.

Generates polynomial type G (x) is $G(x)=X^6+X+1$ in diagram below, all the presets are "1"



Close SW1, switch SW2 to "a" and input the first 14 bits of data.
After the 15th bit, open SW1 and switch SW2 to "b" and output CRCC.

5. Display System name is "video ID" or "Video ID". "ID-1" is displayed on the connection part. The hardware that is using this system should list their compatibilities with the other hardware systems in the catalogs and instructions.

Additional information.

Character information and methods of transmission.

1. Application range This report regulates the transmission of character information using EIAJ CPR-1204.

2. Reference Standard Ministry of Posts and Telecommunications announcement of television character multi-layer broadcasting (Announcement 803) - S60, October 15th

3. Definition of terms

(1) Channel Transmitting a mix of 2 integrated character contents of information.

(2) Category code Code that displays the transmission of the character information categories.

(3) Control code Control code that displays position, color, and line feed in 2 bits

(4) Character code Code that displays the characters in 2 bits

(5) Position specification code Code that specifies the display position in the control code.

(6) Character property code Code that specifies the color and condition of underlined or not underlined in the control code.

(7) Display property code Code that specifies the display method of rollup, line feed and flash.

(8) Caption mode Mode that displays the characters in layers on the standard television picture signal. There are 3 different types of displays and they are listed below.

- Pop-on caption: Coherent to standard television signal, display type that uses the control code, instantaneously changes the accumulated characters.
- Paint-on caption: Display type that sequentially displays characters compatible to the character code that is being transmitted.
- Rollup caption: Display type that scrolls the specified area from the bottom to the top on each line.

(9) Text mode Mode that displays characters on the entire screen and moves the text from bottom to top.

(10) Indent Moves the beginning of the character line next to the first line and then offsets to the right.

4. WORD Structure

Supplementary Diagram 1

WORD 1	bit 14 MSB			WORD	2			bit 7 LSB
1 0 0 0	P		Category	Code				CH
1 0 0 1	P	Control	Code	or	Character	Code	(upper	LSB's)
1 0 1 0	P	Control	Code	or	Character	Code	(lower	LSB's)

P is add number

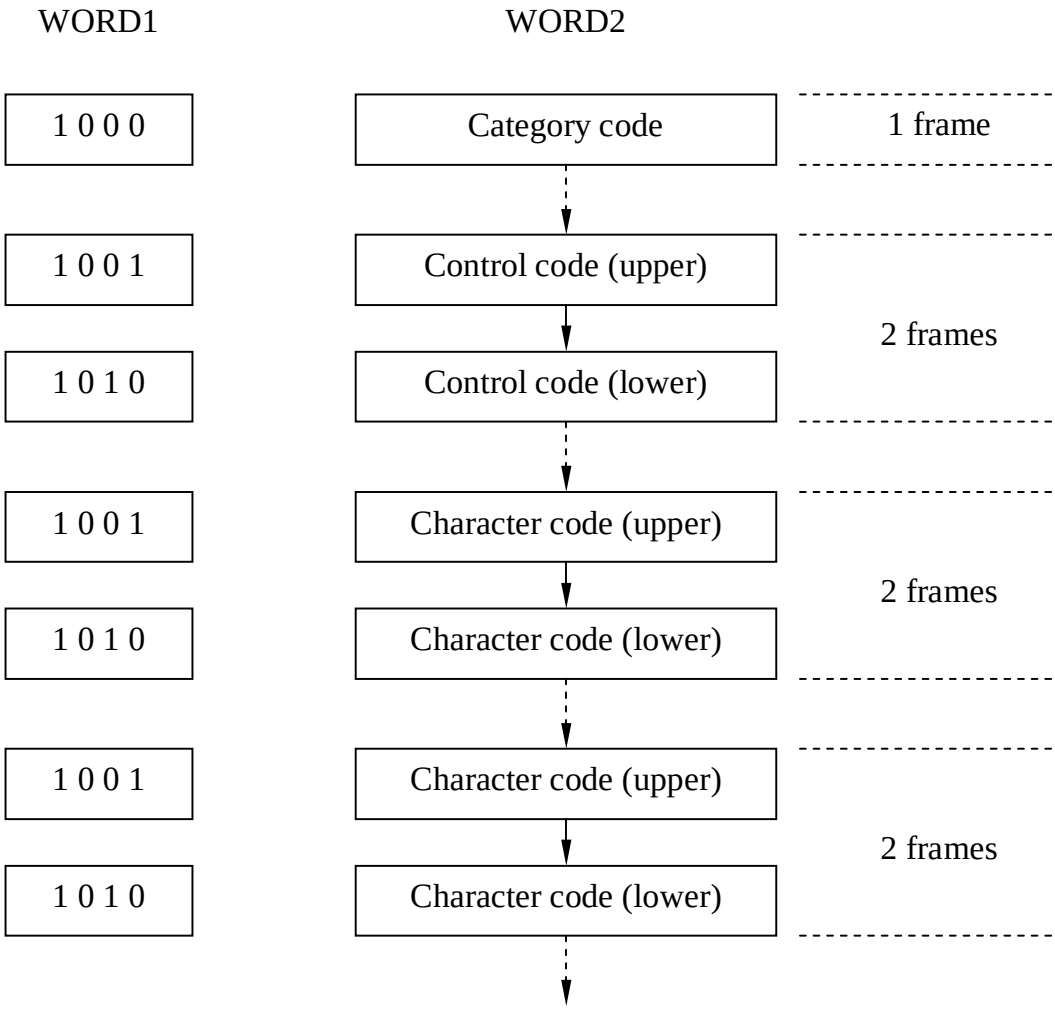
CH (channel) : Channel 0 ("0"), Channel 1 ("1")
Category code: 6 bit, separated into 64 different categories (see additional diagram 2)
Control code, character code: transmits the 2 byte code as upper and lower

5. Transmitting procedure Transmits the following way:

5.1 Category code At the start, transmits the 1bit of category code. Double check on this code then character information is received, until it receives the next category code, this category content is valid.

5.2 Control code Followed by the category code, transmits the 2bites of control code. Transmits Upper data and lower data in 2 frames. Control code is transmitted before the lower control character line.

5.3 Character code After the control code, transmit the 2bits of character code. Transmits upper data and lower data as 2 frames.


WORD1
WORD2
1 0 0 0
Category code
1 frame
1 0 0 1
Control code (upper)
1 0 1 0
Control code (lower)
2 frames
1 0 0 1
Character code (upper)
1 0 1 0
Character code (lower)
2 frames
1 0 0 1
Character code (upper)
1 0 1 0
Character code (lower)
2 frames

6. Control code system

6.1 Category code

Supplementary diagram 2

bit 13 bit 8	Category content
0 0 0 0 0 0	No information
0 0 0 0 0 1	Telap?
0 0 0 0 1 0	Caption
0 0 0 0 1 1	Closed caption information
0 0 0 1 0 0	
0 0 0 1 0 1	Title
0 0 0 1 1 0	Source information
0 0 0 1 1 1	
0 0 1 0 0 0	Program additional information #0
0 0 1 0 0 1	Program additional information #1
0 0 1 0 1 0	
0 0 1 0 1 1	
0 0 1 1 0 0	
0 0 1 1 0 1	
0 0 1 1 1 0	
0 0 1 1 1 1	
•	
•	
•	
•	Others and blank space are undefined

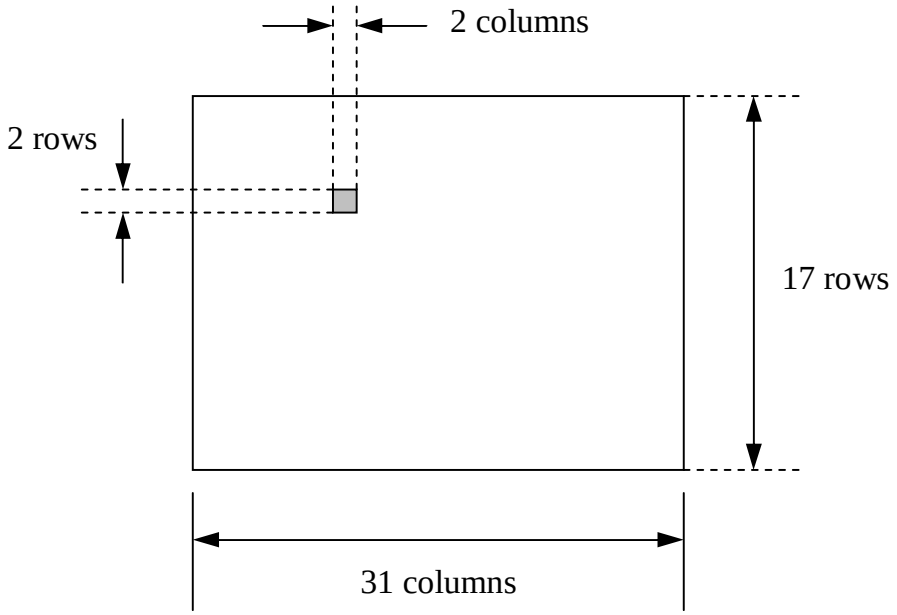
6.2 Control code and character code The distinction between the control code and character code is found in the diagram below.

Supplementary diagram 3

Code		Code Content	
Upper data	Lower data		
10	40~6F	Control Code	Specify position
11	20~2F/40~7F		Character code/ Specify position
12	40~7F		Specify position
13	40~7F		Specify position
14	20~2F		Display property
15	40~7F		Specify position
16	40~7F		Specify position
17	20~2F		Display property
20~7F	20~7F	Character Code	

6.2.1 Display Specification

6.2.1.1. Display area The character display area is in the horizontal direction on line 31, vertical row 17. But displaying one double byte character requires 2lines and 2 rows.



6.2.1.2. Display format There are two types of display modes, caption mode and text mode. Caption mode selects one type of caption from the pop-on captions, event captions, and rollup caption categories.

Pop-on captions and event-on captions display area options up to 4 rows of character area.

Rollup captions display area option to specify up to 2-4 row positions

Character format is in Kanji, hiragana, alphabet, and numbers written horizontally.

All the characters use the double byte character format, and do not use any half-size characters. Kanji is the JIS 1st benchmark, and the 2nd benchmark is the Kanji-ROM.

Character format is standard and italic characters are of two types.

Character color specified as white, green, cyan, red, yellow, and magenta of 7 colors.

Background is half tone.

6.2.2 Display Property Code The code that controls the display mode, and display format, code that also controls character property and position specification code. Control content is displayed as 4 different types on diagram.

Supplemental diagram 4

CODE		Control content of Display property
Upper data	Lower data	
14	20	Pop-on caption start
	21	Back space
	22	
	23	
	24	Delete line end
	25	Rollup 2 lines
	26	Rollup 3 lines
	27	Rollup 4 lines
	28	Flash on
	29	Paint on caption start
	2A	Text start
	2B	Text display restart
	2C	Delete memory display
	2D	Line feed
	2E	Delete non-display memory
	2F	Switch display memory
17	21	Tab offset 1 line
	22	Tab offset 2 lines
	23	Tab offset 3 lines

Code is displayed in Hex

Display control content is following:

- Pop-on caption start (caption mode only)
  Specify the start of pop-on caption, transfer the character to non-display memory.
- Backspace
  Begin the move of the active position line, delete the character and character property code. Move the current display line to next lower line.
- Line end delete
  The moving position line only, delete the current movement to line end of character and character property code.

- Rollup 2 line (caption mode only)
  Specify the beginning of the rollup caption, and specify the rollup movement area of the number of lines in 2 lines.

- Rollup 3 line (caption mode only)
  Specifies the beginning of the rollup caption, and specifies the rollup movement area of number of lines in 3 lines.

- Rollup 4 line (caption mode only)
  Specifies the beginning of the rollup caption, and specifies the rollup movement area of lines in 3 lines.

- Flash-on
  Specifies the flash-on. This code blinks any character after this code. Blinking line end will be after position specification code, character property, or line ending.

- Paint-on caption start (caption mode only)
  Specifies the beginning of the paint-on caption display. After the specification, characters will be displayed as needed.

- Text Start (text mode only)
  Specifies the beginning of text mode. By this command, delete the display memory and specify the display position as 1 line, 1 row.

- Text display reversion (text mode only)
  Specify that the character be in text mode. The code will not delete the display screen or move the display position.

- Delete display memory (caption mode only)
  Specifies to delete all the characters in the current display memory.

- Line feed
  Specifies line movement. Move the current display line up or down one line, and position it on the beginning of the display line.

- Delete non-display memory (caption mode only)
  Other than the current display memory, specify to delete all the characters in the non-display memory

- Switch to display memory (caption mode only)
  Specifies the switch between display memory and non-display memory, and after that becomes a pop-on caption.

- Tab offset one line
  Specify the movement of the active position line. Specify the current display line up one line. (tab offset command does not affect the character inside the movement property)

- Tab offset two lines
  Specify the movement of the active position line. Specify to move the current display line up 2 lines.

- Tab offset three lines
  Specify the movement of the active position line. Specify to move the current display line up 3 lines.

6.2.3 Character Property Code Character property code is the code that specifies character color and character type (standard, italic, and underline). Character property code content is in diagram 5.

Supplemental diagram 5

Code		Control content of character property
Upper data	Lower data	
11	20	White
	21	White Underline
	22	Green
	23	Green Underline
	24	Blue
	25	Blue underline
	26	Cyan
	27	Cyan Underline
	28	Red
	29	Red Underline
	2A	Yellow
	2B	Yellow Underline
	2C	Magenta
	2D	Magenta Underline
	2E	Italic
	2F	Italic Underline

Code is displayed in hex

Character property priority is as follows:
Character color specification has the highest priority.

Italic characters have the highest priority. When character color and italic body specification is within the same specification, Italic specification will be specified after character color.

When changing from italic to standard, specify in the character property code.

For specification of the underlined condition, position specification code, character color and italic property code when lower bit is 1, specify the underline. When bit is 0 specify the cancellation of the underline.

Flash-on property code does not affect character color, Italic body or underline property condition. The flash-on control code is transmitted after the character property code or position specification code.

6.2.4 Position Specification Code (line, color specification) Position specification code specifies multiples of the following: character display line, underline or not underline, character color and character style. Position specification code control content is listed in diagrams 6 and 7.

Supplemental diagram 6

Control content	Subject line	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Code	11	11	12	12	15	15	16	16	17	17	10	13	13	14	14	10
White		40	60	40	60	40	60	40	60	40	60	40	60	40	60	40	60
White Underline		41	61	41	61	41	61	41	61	41	61	41	61	41	61	41	61
Green		42	62	42	62	42	62	42	62	42	62	42	62	42	62	42	62
Green Underline		43	63	43	63	43	63	43	63	43	63	43	63	43	63	43	63
Blue		44	64	44	64	44	64	44	64	44	64	44	64	44	64	44	64
Blue underline		45	65	45	65	45	65	45	65	45	65	45	65	45	65	45	65
Cyan		46	66	46	66	46	66	46	66	46	66	46	66	46	66	46	66
Cyan underline		47	67	47	67	47	67	47	67	47	67	47	67	47	67	47	67
Red		48	68	48	68	48	68	48	68	48	68	48	68	48	68	48	68
Red underline		49	69	49	69	49	69	49	69	49	69	49	69	49	69	49	69
Yellow		4A	6A	4A	6A	4A	6A	4A	6A	4A	6A	4A	6A	4A	6A	4A	6A
Yellow underline		4B	6B	4B	6B	4B	6B	4B	6B	4B	6B	4B	6B	4B	6B	4B	6B
Magenta		4C	6C	4C	6C	4C	6C	4C	6C	4C	6C	4C	6C	4C	6C	4C	6C
Magenta underline		4D	6D	4D	6D	4D	6D	4D	6D	4D	6D	4D	6D	4D	6D	4D	6D
Italic Body		4E	6E	4E	6E	4E	6E	4E	6E	4E	6E	4E	6E	4E	6E	4E	6E
Italic body underline		4F	6F	4F	6F	4F	6F	4F	6F	4F	6F	4F	6F	4F	6F	4F	6F

Code is displayed in hex

6.2.5 Position Specification Code (line indent specification)

Supplemental diagram 7

Control content	Subject line	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Code	11	11	12	12	15	15	16	16	17	17	10	13	13	14	14	10
Indent 0		50	70	50	70	50	70	50	70	50	70	50	70	50	70	50	70
Indent 0 underline		51	71	51	71	51	71	51	71	51	71	51	71	51	71	51	71
Indent 4		52	72	52	72	52	75	52	75	52	75	52	75	52	75	52	75
Indent 4 underline		53	73	53	73	53	73	53	73	53	73	53	73	53	73	53	73
Indent 8		54	74	54	74	54	74	54	74	54	74	54	74	54	74	54	74
Indent 8 underline		55	75	55	75	55	75	55	75	55	75	55	75	55	75	55	75
Indent 12		56	76	56	76	56	76	56	76	56	76	56	76	56	76	56	76
Indent 12 underline		57	77	57	77	57	77	57	77	57	77	57	77	57	77	57	77
Indent 16		58	78	58	78	58	78	58	78	58	78	58	78	58	78	58	78
Indent 16 underline		59	79	59	79	59	79	59	79	59	79	59	79	59	79	59	79
Indent 20		5A	7A	5A	7A	5A	7A	5A	7A	5A	7A	5A	7A	5A	7A	5A	7A
Indent 20 underline		5B	7B	5B	7B	5B	7B	5B	7B	5B	7B	5B	7B	5B	7B	5B	7B
Indent 24		5C	7C	5C	7C	5C	7C	5C	7C	5C	7C	5C	7C	5C	7C	5C	7C
Indent 24 underline		5D	7D	5D	7D	5D	7D	5D	7D	5D	7D	5D	7D	5D	7D	5D	7D
Indent 28		5E	7E	5E	7E	5E	7E	5E	7E	5E	7E	5E	7E	5E	7E	5E	7E
Indent 28 underline		5F	7F	5F	7F	5F	7F	5F	7F	5F	7F	5F	7F	5F	7F	5F	7F

Code is displayed n hexametric

All the position specification codes that specify the indent condition have white attributes.

6.2.6 Character Code Character code is attributed according to “calling the 8 units code of Kanji character group at the GL code area” the character multi-layer dynamic broadcast.

Explanation

1. The goal of this constitution and background In September 1992, EIAK temporarily specified CPX-1204 (aspect ratio and different picture signal identification signal and its transmission method) and is constituted as 16:9 wide screen utilization progresses, interface standardization for transmitting the picture aspect ratio information is established. Although this specification had scalability of transmitting other aspect ratio information, at the time only the aspect ratio was standardized and later the issues the standardization were addressed as needed.

Later, the AV system standardization committee proposed to others that parallels can be used. In October 1995, the investigation group changed the word structure, changed the signal frequency differences, changed the type of information that was transferred, investigated the information bit code distribution, and created this technical report. This report not only posted the aspect ratio information, it also dealt with the other types of information. The name was subsequently changed to "Video ID signal transmission method on VBI".

The VBI has limitations, but hopefully it will be used. This system is for mainly package media and the transmission method was regulated, but hopefully, in view of the information in this technical report, the VBI will become more widely useful.

2. Main content explanation

1. Transmission method Although it was decided to use the vertical blanking interval, after studying each media type, each interval line is used for some type of object. So, the receiver's position is lowered due to the use of teletext, closed captioning and other types of media, and chose 20H/283H on this technical report. As a general principle, 20H/285H transmits the same information. As noted before, this depends on the media type being used, and if there are different signals in existence, the input of the receiver has to identify the signal based on this report or other signals.

2. Identification signal As noted before, to simplify the identification of other signals, increase the CRC and lower the lower bit rate signal. This will stop malfunction of the low pulse filter. This will also decrease malfunctions involving the play and recording functions on VTR's.

3. Attention to transient (sudden mode change) For example, when the sender's hardware is suddenly switched from normal play to search, the hardware is required to maintain speed to stabilize and hold the function to the previous condition.

3. EIAJ changes and additions from CPX-1204

(1) Signal wave tolerance Compared to the EIAJ CPX-1204, the range of the startup of Sync to Startup of Ref time tolerance has changed and each bit pulse length tolerance has changed. In addition, theregulation of cumulative time tolerance with Ref to each bit was added. These changes are made to simplify the decoder and encoder's design.

(2) WORD Structure In the report, EIAJ CPX-1204 is structured as WORD0 = 6 bits, WORD1 = 4 bits, and WORD2 = 4 bits, but in this report this was changed to WORD0 = 2 bits, WORD1 = 4 bits, and WORD2 = 8 bits. Using WORD1 as a header allows it to transmit 16 different types (8 bit each) of information.

(3) Related to aspect ratio information This information was created in anticipation of mainly wide television screen display control. In the squeeze mode, the screen is stretched horizontally and displayed to fit within the 16:9 aspect ratio. Upon acquisition of the letterbox signal, the main part of the 16:9 aspect ratio will be displayed on the full screen. Therefore, within the letterbox signal, it is not necessary to display the blank part of the information.

Definitions for bits 1 and 2 were not clearly defined, so it was necessary to clearly define the bit 1 and 2 combination and regulatory mechanisms. Televisions that have already sold will interpret input (1, 1) as full screen or zoom mode. When (1, 1) is inputted to the receiver, the receiver will treat this input as "no screen information". In addition (0, 0) does not have screen display specification, so it as well is defined as "no information".

(4) Handling WORD1 (0 0 0 0) WORD1 (0 0 0 0) is used for the transmission of digital hardware information, and therefore it is not covered in this report.

(5) Code allocation This regulated information refers to packaged media. For the sake of versatility and standardization, the consumer digital VTR format (IEC1834) is used as a reference for consistency sake. This information can be used independently or with other specified systems. Set the consideration information header to "no information" when there is no information to transmit or the information is defined.

Unknown defined bytes and combinations of bits are still untouched, but when a new definition is necessary, the definition will be presented at a consultation.

(6) Transmission frequency In information, large numbers of bit frequencies are transmitted over multiple frames. For example, instead of date and time information being required on every frame, the information is frequently transmitted in a 2 second period, being sent two or more times. But 3D information and pull down information requires the higher transmission frequency, therefore it limits the usage of the other codes.

(7) Recorded date, time This report follows the consumer digital VTR format and is defined. But time zones are eliminated.

(8) Soft length, time left Although this report follows the consumer digital VTR format, there are problems with transmission volume. Therefore, this report regulates the 14bits of title and chapter, so "seconds" became optional.

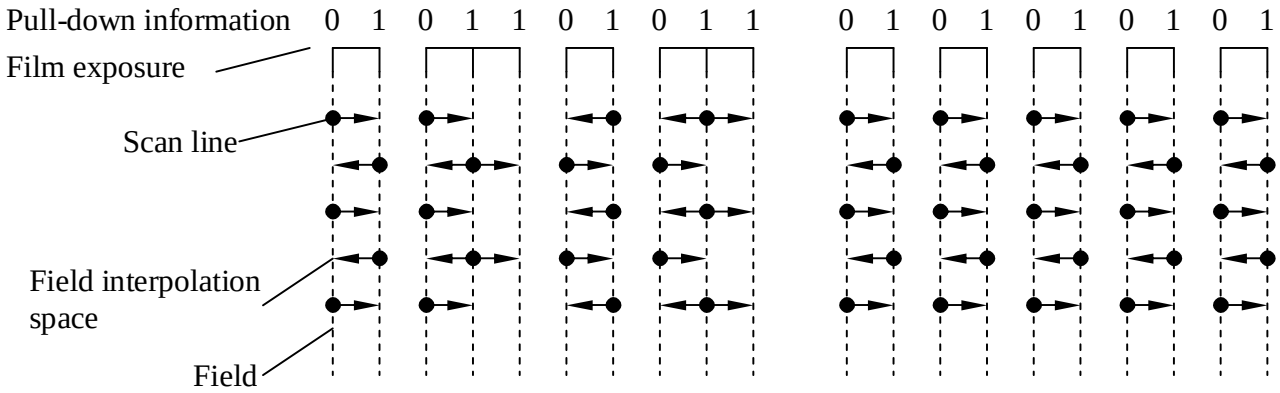
(9) 3D information In the future, three dimensional television or head mount display-types of 3D display function will become more popular. For this reason, the screen must be able to be identified. In 3D, it becomes more important to identify the left and right screens. Set the same bits for each screen and at the switch between the bits, it must be able to identify the distinction between the left and right. For the transmission method, transmit 4 frames continuously, and by doing so, the display is able to detect the switch between the two. It is possible that between the two, other information could be sandwiched, so therefore the receiver should transmit between left and right consistently.

(10) Source Information This report follows the consumer digital VTR format for definition. Transmission volume and its related information are narrowed down to the following 5 types: Camera, line, cable, tuner, and prerecorded tape. Also defined are the multiple identification numbers for camera or line inputs.

(11) Color Flag Identification noise problems will occur when connecting a surveillance camera to this system. When B/W, color, and VTR are connected, problems are caused by identifying whether the color burst is there or not. To avoid this problem, the color flag will identify color or b/w.

(12) Pull-Down information For example, when switching from a 24-frame movie to video signals (telecine), the same frames from 2 or 3 fields of video signal will be generated. This method is called 3-2 pull-down. When playing this video signal on a sequential scanning television, if there is information which defines which field generated which frame, it will transmit this information between the appropriate scan line interpolations, which will increase the quality of the picture. Pull-down information is transmitted when the field that is generated prior to the last field, but within the same frame (called "Continuous frame") is detected. If it is generated from a different frame it is called a "frame change" (Refer to the next page diagram).

It is possible that other information can be interleaved, so the receiver side hardware should consider keeping the continuance.



(a) 24 frame field (b) 30 frames field

(13) Header information When recording on the VTR, trying to play a recorded tape, index information (VISS) won't transmit as it is. It needs to be encoded. When playing from the indexed position, outputting header information of the VBI can be recorded with the index information.

(14) Package ID Defining the package ID on the cassette tape or package will identify what content is on the tape. If there are multiple VTR signals, the package ID can be identified on any of the pieces of hardware, and will identify the hardware that is being used the by hardware code. The hardware code is based on the transmission volume and usage conditions, and identifies up to 255 pieces of hardware, and 65535 lines.

(15) Display It is integrated as "ID-1". Interim regulation EIAJ CPX-1204 function is kept, and integrated as the display name "ID-1" to avoid confusion of the user by increasing the type of display. Each piece of hardware might have different functions. The differences must be shown in the catalogs or instructions.

(16) Transmitting character information There is no format that records the Japanese character sub-titles and plays them on the consumer VTR, so this information must be defined and transmitted to it. For formatting purposes, television test broadcasting format or United States' closed caption format is considered adoptable to the television.

3. In relation to the regulation EIAJ CPR-1202 As an aspect ratio information transmission method, EIAJ technical report CPR-1202 (aspect ration difference between identification signal of picture signal and transmission method (I)) is constituted. The relationship between this report and the other report are as support to each other, not as competition with each other. For various reasons, there are differences between the two reports, the final decision is made by each individual manufacturer.

4. Reviewing committee This report is reviewed mainly by a sub-division of the AV System standardization committee, "Transfer Method of Video ID information using VBI" and project group. Each committee name will be listed below.

<AV system standardization committee>

Chairman	Sony	Mr.Watanabe

< "Transfer Method of Video ID information using VBI" review group/ project group>

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