

1-2. SELF-TEST INDICATION DISPLAY

This VTR has a self-diagnosis and display function. If the VTR detects trouble during installation or during use, one of the following Fault Indication Codes will automatically appear in the VTR display. Fault Indication codes are displayed in the form of a single English letter followed by two numbers, as for example "H01".

Note:1. The indication "U" is displayed on the FIP while power remains on.

2. Otherwise, the indication "H" or "F" is displayed on the FIP, and the power is automatically turned off. When the power is turned on again, the Fault Indication Code will disappear and the unit will return to normal display mode (either clock or counter).

3. This Fault Indication Code will be stored in the Timer microprocessor even with the AC plug disconnected.

The two-digit number portion of the stored Fault Indication Code can be redisplayed in the FIP's "second" display position (the last 2 digits on the light) by placing the unit in Service Mode Number 2 when turning on Service Information Display as for example "01" or "02" etc.

If a second error occurs, only the most recent error will be displayed and stored.

4. To erase the stored Fault Indication Code data, Turn the Shuttle Ring to FF then push the EJECT button for 5 seconds.

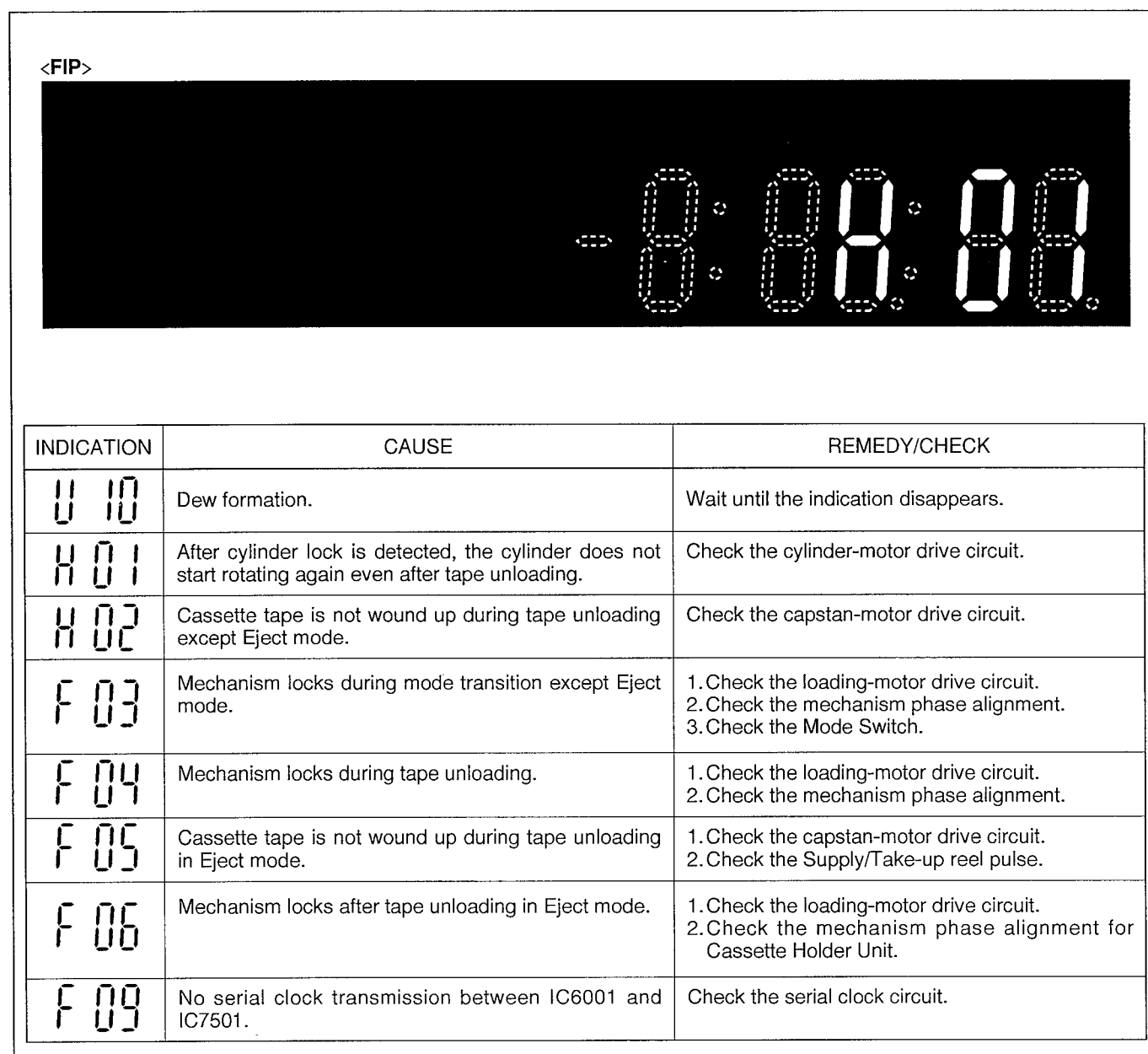


Fig. T1 Self-Test Indication Display

1-3. SERVICE INFORMATION DISPLAY

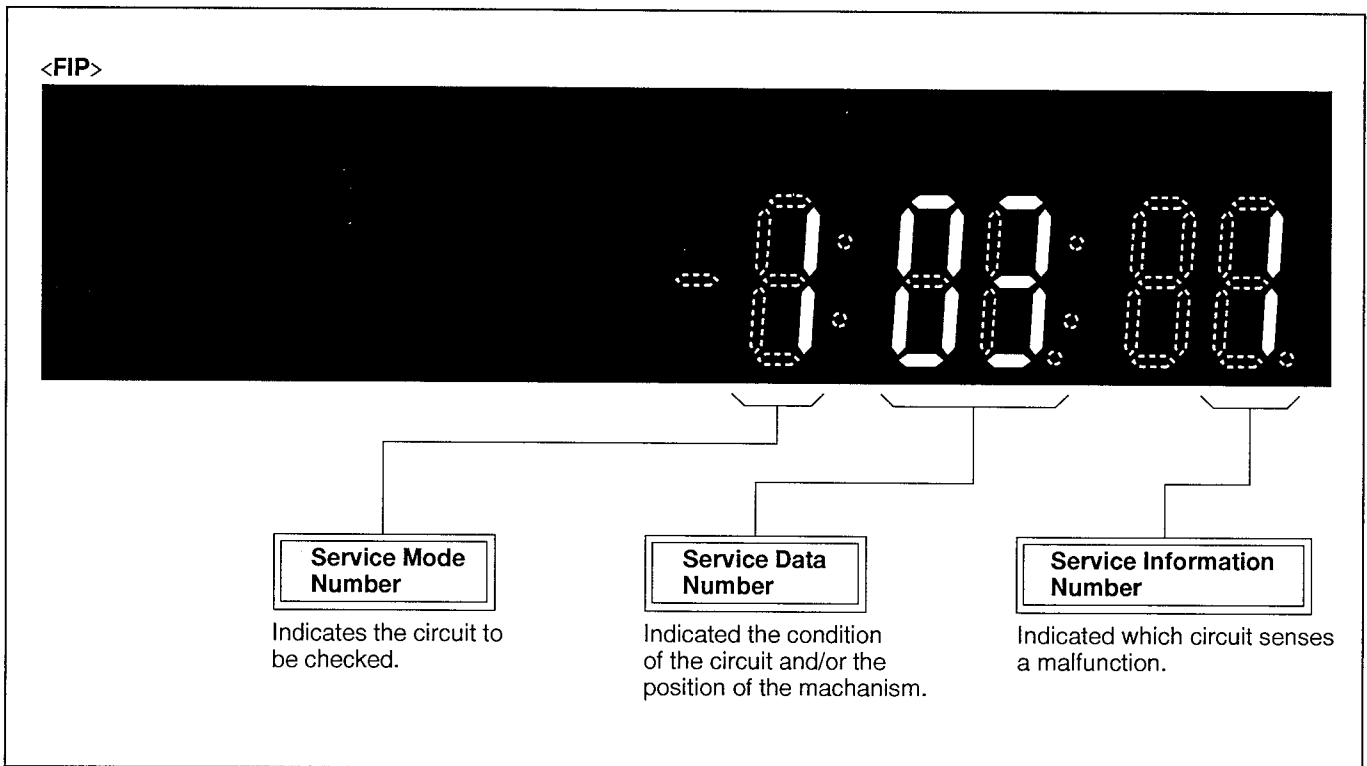


Fig. D1 Service Information Display

1-3-1. Purpose of Service Information Display

This information aids trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician during repair while the service information can be used by the consumer to diagnose malfunctions allowing the technician to provide a more accurate repair cost estimate and reduce repair time.

1-3-2. Turning on Service Information Display

- (1) Turn the Shuttle Ring to FF then push the EJECT button to set the Service Mode.

In the Service Information Display, there are four digits divided into 3 functions.

The first digit indicates which of the 7 service modes that the unit is currently in.

MODE 1 : Checks tape protection circuit
MODE 2 : Checks tape transport mechanism
MODE 3 : Checks mode switching operation
MODE 4 : Checks control buttons
MODE 5 : Checks capstan motor
MODE 6 : Checks cylinder motor
MODE 7 : Checks loading/unloading operation

The second and third digits are service data which indicate the condition of the circuit or mechanism being checked.

The forth digit is the service Information display. It is to be used by the consumer to help determine the source of a malfunction. The service information display operates independently of the service modes and stores the fault indication in memory for as long as AC power is not supplied.

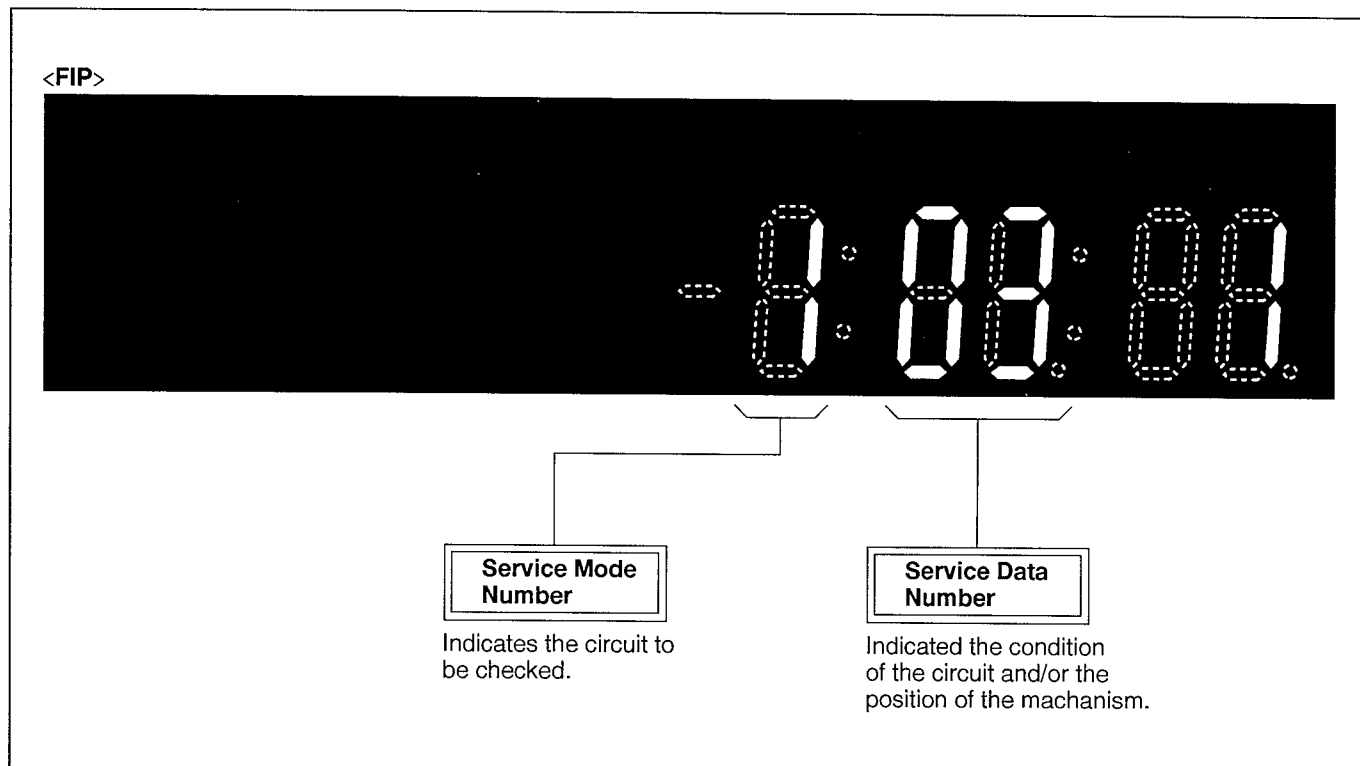


Fig. D2 Service Mode Number and Service Data Number on S.I.D.

- (1) Turn on Service Information Display.
- (2) To change Service Modes turn the Shuttle Ring to FF then push the EJECT button.

- (3) Mode 1: Checks that the Sensor LED, Supply & Take-up Sensor circuits check the circuits by blocking the light from the Sensor LED to either or both Supply & Take-up Sensors. When the light is blocked to both sensors, "00" should be indicated on the service data number.

1

- When the light is blocked to the supply sensor, "01" should be indicated.

- (4) Mode 2: Checks the mode switch circuit while indicating mechanism position. Service Data Numbers indicate the position of the mode switch and there by the mechanism position.

2

- (5) Mode 3: Checks that mode switch circuit operations have been completed. Service Data Number should indicate "00" after each mechanism operation is completed.

3

- (6) Mode 4: Checks the operation circuit. Indicates if IC6001 receives the operating commands from the mode buttons and/or remote controller.

4

- (7) Mode 5: Checks the capstan motor circuit. Indicates if the IC6001 has received the command to rotate the capstan motor.

5

- (8) Mode 6: Checks the cylinder motor circuit. IC6001 has received the command to rotate the cylinder motor.

6

- (9) Mode 7: Checks the Loading/Unloading Operation. The Loading Motor rotates for loading operation when the "PLAY" button is pressed. The Loading Motor rotates for unloading operation when the "STOP" button is pressed. This mode can be displayed indefinitely until the OPERATE button is pressed.

7

<NOTE>

Refer to Fig. D5 for details of Service Data Numbers.

1-3-4. Service Information Number

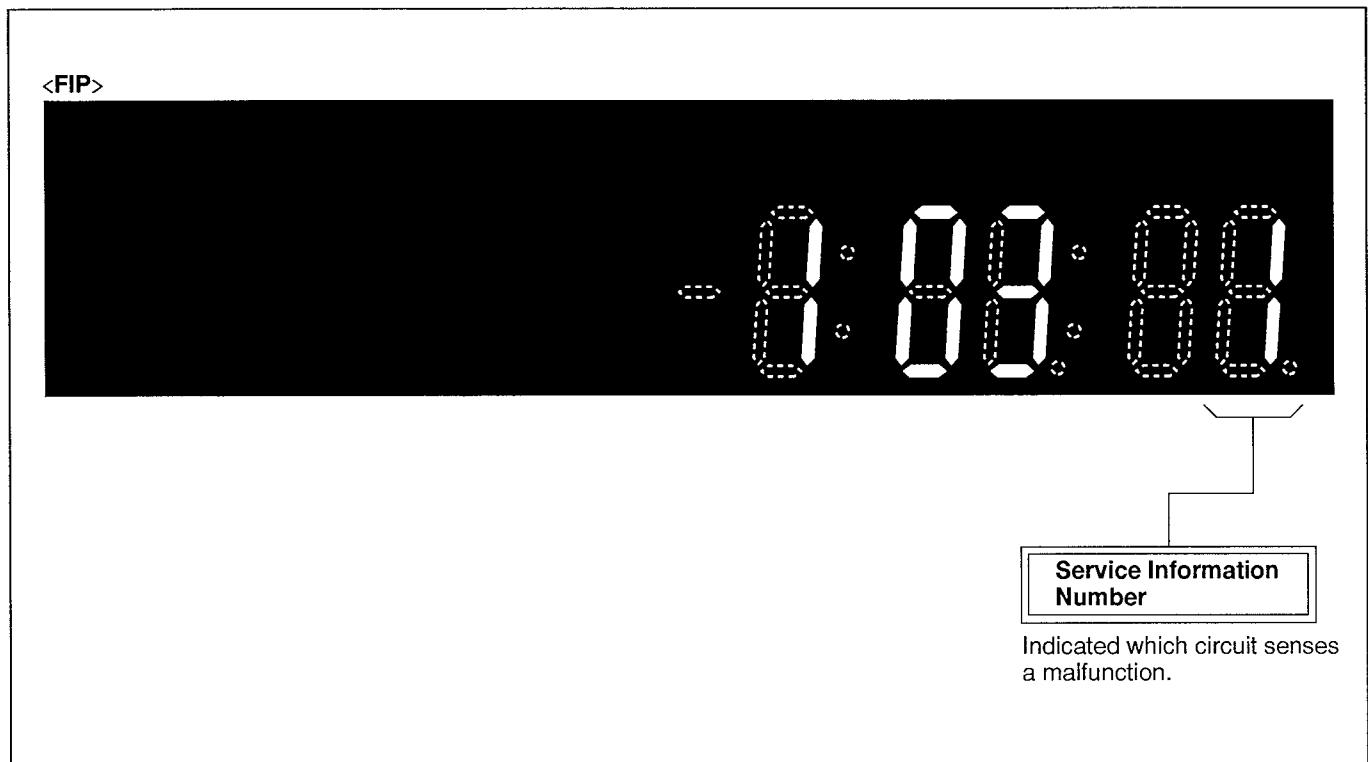


Fig. D3 Service Information Number on S.I.D.

Refer to Fig. D4 for details of Service Information Number.

Note:

The Service Information Number display is independent of the service mode display.

The Service Information Number will be stored as long as AC power is not supplied. (If can be displayed in the Service Mode 2.)

If a second error occurs, only the most recent error will be displayed.

Service Information Number	Malfunction
00	Normal (No problem)
01	Cylinder stop
02	Tape reel stop
03	Stop at position other than 4 or 6
04	Stop during unloading
05	Faulty capstan rotation
06	Stop during Cassette-In/Eject operation

Fig. D4 Detail Service Information Numbers

Service mode Number	Note for checking Service Data Numbers	Service Data Numbers	Indication	Remarks
1		00	No light detected at either sensor.	Tape not required.
		01	Tape Beginning. Light to Supply Photo Sensor is blocked.	
		02	Tape End. Light to Take-up Photo Sensor is blocked.	
		03	Light detected at both sensors.	
2		00	EJECT	Tape Required. *1: STOP; The Pinch Roller is on the capstan motor shaft. *2: STOP; The Pinch Roller is off the capstan motor shaft. Refer to Fig. D7 to Check mechanism Position and timing.
		01	Cassette-down	
		02	REV, REV SLOW	
		03	Loading/Unloading	
		04	PLAY/REC, STILL/PAUSE, CUE, FWD SLOW, STOP3 *1	
		05	STOP *2	
		06	FF/REW	
		07	Intermediate position	Tape Required.
		00	Any display other than "00" indicates a fault in the mode switch circuit or system.	
4	Display only when the operating button is pressed.	Refer to Fig. D6		Tape not required.
5	Left digit only, disregard Right digit display.	8 1 Left Right Digit Digit	8, 9, u, A, -, n, L, and no display indicate that the Capstan motor "PLAY" command received by IC6001.	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.
	Right digit only, disregard left digit display.	8 7 Left Right Digit Digit	1, 2, 3, 4, 5, 6, 7, indicate that the Capstan motor "CUE, FF, Forward Slow" commands received by IC6001.	
	Right digit only, disregard left digit display.	8 1 Left Right Digit Digit	8, 9, u, A, -, n, L, and no display indicate that the Capstan motor "Reverse, Rew, Reverse Slow" commands received by IC6001.	
6	Left digit only, disregard Right digit display.	1 0 Left Right Digit Digit	1, 3, 5, 7, 9, A, n and no display indicate that the cylinder motor "ON" command received by IC6001.	Tape required. If a symbol other than those listed is displayed, a malfunction in that circuit is indicated.

Fig. D5 Service Data Display and Indication

1-3-5. Timing Chart from Mode SW to System control
IC6001

System control IC6001 senses the mechanism position
through the Mode SW.

Fig. D6 shows the timing for Service Mode Number 2.

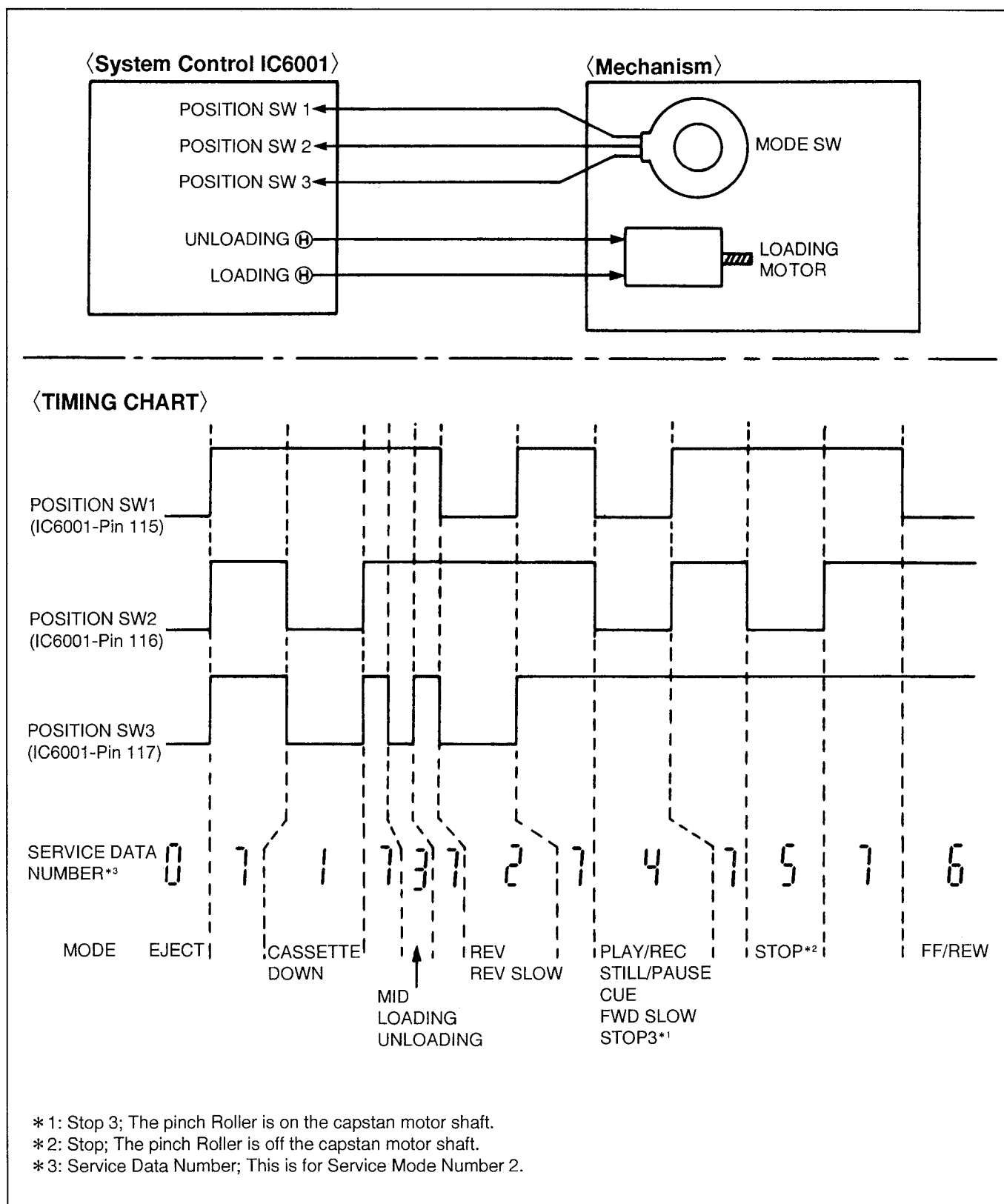


Fig. D6 Timing Chart of Mode SW

1-3-6. Input/Output Chart for IC6001

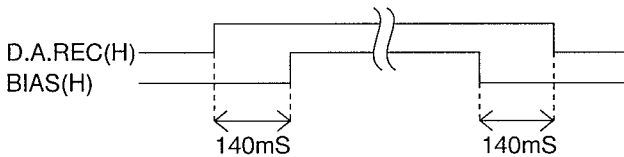
Pin Number	Input/Output	Port Name	Function
1	O	TV (H) / VTR (L)	TV/VTR switch output
2	O	FM MUTE(H)	This port is high during special playback (CUE, REV, SLOW, STILL) mode.
3	O	AUDIO MUTE (H)	This port is high during special playback (CUE, REV, SLOW, STILL) mode.
4	O	EDIT MODE (H)	This port is high during edit mode.
5	O	VIDEO EE (L)	This port is low during EE mode.
6	O	SLOW/STILL (L)	This port is low during SLOW and STILL modes.
7	O	CHG AT (H)	This port is high while the auto-tracking is performed in variable speed playback mode.
8	O	VOLTAGE CHANGE (H)	This port is high while the loading motor torque is increased in FF and REW modes.
9	O	LM LIMIT (H)	Loading motor torque limiter output
10	O	FF/REW (L)	This port is low during FF and REW modes.
11	O	UNLOADING (H)	This port is high while the mechanism is unloaded.
12	O	LOADING (H)	This port is high while the mechanism is loaded.
13	O	D.A. REC (H)	<p>Normal audio recording control</p> 
14	O	BIAS (H)	
15	O	MIX (H)	<p>Normal and HIFI audio mix control</p> <p>MIX ON : HIGH</p> <p>MIX OFF : LOW</p>
16	I	SHORT CHECK (H)	<p>DC voltage (BIAS (H)) detection</p> <ul style="list-style-type: none"> • When the low voltage is detected in recording mode, the VCR is turned off. • When the high voltage is detected in except recording mode, the VCR is turned off.
17	I	S-VHS PB (H)	This port is high during S-VHS playback.
18	O	PB AI2 (H)	AI playback control
19	O	PB AI1 (H)	AI playback control
20	I	S-TAB (L)	This port is low while the cassette tape with safety tab is inserted.

Fig. MP1

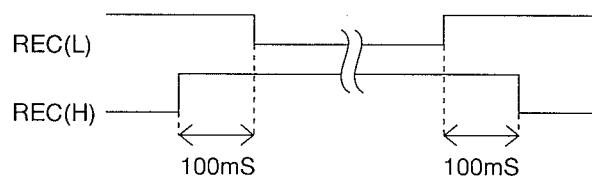
Pin Number	Input/Output	Port Name	Function															
21	I	ABS NORM IN	HIFI audio mode detection ● When the low voltage is detected, the audio output is compulsory normal audio mode.															
22	I	L CH IN	HIFI audio mode detection <table><tr><td></td><td>L CH IN</td><td>R CH IN</td></tr><tr><td>L CH SEL</td><td>L</td><td>H</td></tr><tr><td>R CH SEL</td><td>H</td><td>L</td></tr><tr><td>L+R SEL</td><td>L</td><td>L</td></tr><tr><td>NORMAL SEL</td><td>H</td><td>H</td></tr></table>		L CH IN	R CH IN	L CH SEL	L	H	R CH SEL	H	L	L+R SEL	L	L	NORMAL SEL	H	H
	L CH IN	R CH IN																
L CH SEL	L	H																
R CH SEL	H	L																
L+R SEL	L	L																
NORMAL SEL	H	H																
23	I	R CH IN																
24	I	REC AI (L)	AI mode selection AI PB ONLY : HIGH AI PB AND REC : LOW															
25	I	RESET (L)	This port is low while IC6001 is reset.															
26	I	MODE SEL	Active mode selection for microprocessor															
27	I	NC	Not used (Low setting)															
28	I	PG AUTO (H)	PG shifter adjustment selection AUTO ADJUST : HIGH MANUAL ADJUST : LOW															
29	O	CAPSTAN RVS (H)	Capstan motor direction selection REVERSE : HIGH FORWARD : LOW															
30	O	REC (L)	DC voltage control for recording mode. 															
31	O	REC (H)																
32	O	A. DUB (H)	This port is high during audio dubbing mode.															
33	O	INSERT (L)	This port is low during insert mode.															
34	O	SYSTEM 3	Refer to Fig. MP. 6															
35	O	SYSTEM 4	Refer to Fig. MP. 6															
36	O	SYSTEM 5	Refer to Fig. MP. 6															
37	I	DIGITAL 5V	VDD															
38	O	12MHz OUT	Oscillator output															
39	I	12MHz IN	Oscillator input															
40	O	32KHz OUT	Oscillator output															
41	I	32KHz IN	Oscillator input															

Fig. MP2

Pin Number	Input/Output	Port Name	Function
42	I	DIGITAL GND	GND
43	O	FULL ERASE (H)	Full erase on/off control ON : HIGH OFF : LOW
44	O	D. REC (H)	Video signal recording on/off control
45	O	D. FM. REC (H)	HIFI audio signal recording on/off control
46	O	FLYING ERASE (H)	Flying erase head on/off control ON : HIGH OFF : LOW
47	O	REC CUR 1	AI REC current switching signal output
48	O	REC CUR 2	AI REC current switching signal output
49	O	REC CUR 3	AI REC current switching signal output
50	O	A. H. SW	HIFI audio head switching signal output
51	O	S. DATA OUT	Serial data output
52	I	S. DATA IN	Serial data input
53	O	S. CLOCK	Serial clock output
54	O	5P S. DATA OUT	EDIT 5P serial data output
55	I	5P S. DATA IN	EDIT 5P serial data input
56	O	5P S. CLOCK	EDIT 5P serial clock output
57	O	CAP R/S/F	Capstan rotation direction control REVERSE : HIGH STOP : MIDDLE FOWARD : LOW
58	O	CURRENT LIMIT	Capstan motor current limiter output
59	O	ENV2	AI PB control signal output
60	O	PIC VR OUT	This port supplies the voltage which depends on picture VR setting.
61	O	ART V/H/N	This port supplies artificial vertical sync signal to stabilize the picture in special playback mode.

Fig. MP3

Pin Number	Input/Output	Port Name	Function												
62	O	VIDEO H. SW	Video head switching signal output												
63	O	ROTARY SW	Rotary switching signal output												
64	O	H. AMP. SW	Head amp switching signal output												
65	I	ENVE SELECT	This port receives the playback envelope signal level to select the video head in special playback mode.												
94	I	T- PHOTO	This port receives the signal when take-up photo sensor detects the tape beginning.												
95	I	S-PHOTO	This port receives the signal when supply photo sensor detects the tape end.												
96	I	NORMAL/ SERVICE/TEST	NORMAL/SERVICE/TEST mode selection <table><tr><td>INPUT VOLTAGE</td><td>MODE</td></tr><tr><td>MORE THAN 4.0V</td><td>NORMAL</td></tr><tr><td>2.5V~4.0V</td><td>SERVICE</td></tr><tr><td>LESS THAN 2.5V</td><td>TEST</td></tr></table>	INPUT VOLTAGE	MODE	MORE THAN 4.0V	NORMAL	2.5V~4.0V	SERVICE	LESS THAN 2.5V	TEST				
INPUT VOLTAGE	MODE														
MORE THAN 4.0V	NORMAL														
2.5V~4.0V	SERVICE														
LESS THAN 2.5V	TEST														
97	I	SYSTEM SELECT	System mode selection for auto setup <table><tr><td>INPUT VOLTAGE</td><td>MODE</td></tr><tr><td>MORE THAN 3.0V</td><td>MODE 4</td></tr><tr><td>2.0V~3.0V</td><td>MODE 2</td></tr><tr><td>LESS THAN 2.0V</td><td>MODE 1</td></tr></table>	INPUT VOLTAGE	MODE	MORE THAN 3.0V	MODE 4	2.0V~3.0V	MODE 2	LESS THAN 2.0V	MODE 1				
INPUT VOLTAGE	MODE														
MORE THAN 3.0V	MODE 4														
2.0V~3.0V	MODE 2														
LESS THAN 2.0V	MODE 1														
98	I	STEREO/BIL	Audio mode detection for display on the OSD <table><tr><td>INPUT VOLTAGE</td><td>DISPLAY</td></tr><tr><td>MORE THAN 4.2V</td><td>NO DISPLAY</td></tr><tr><td>3.0V~4.2V</td><td>MONO 1</td></tr><tr><td>2.0V~3.0V</td><td>BILINGUAL</td></tr><tr><td>0.8V~2.0V</td><td>MONO 1+2</td></tr><tr><td>LESS THAN 0.8V</td><td>STEREO</td></tr></table>	INPUT VOLTAGE	DISPLAY	MORE THAN 4.2V	NO DISPLAY	3.0V~4.2V	MONO 1	2.0V~3.0V	BILINGUAL	0.8V~2.0V	MONO 1+2	LESS THAN 0.8V	STEREO
INPUT VOLTAGE	DISPLAY														
MORE THAN 4.2V	NO DISPLAY														
3.0V~4.2V	MONO 1														
2.0V~3.0V	BILINGUAL														
0.8V~2.0V	MONO 1+2														
LESS THAN 0.8V	STEREO														
99	I	DEW SNS	This port is more than 1.36V during detecting the dew formation.												
100	I	ATIC SEL	Head amp IC setting for playback envelope detection <table><tr><td>INPUT VOLTAGE</td><td>IC</td></tr><tr><td>MORE THAN 3.0V</td><td>TEA5705</td></tr><tr><td>2.0V~3.0V</td><td>AN3336</td></tr><tr><td>LESS THAN 2.0V</td><td>AN3360</td></tr></table>	INPUT VOLTAGE	IC	MORE THAN 3.0V	TEA5705	2.0V~3.0V	AN3336	LESS THAN 2.0V	AN3360				
INPUT VOLTAGE	IC														
MORE THAN 3.0V	TEA5705														
2.0V~3.0V	AN3336														
LESS THAN 2.0V	AN3360														
101	I	PIC VR IN	This port receives the voltage which depends on picture VR setting.												
102	I	CHROMA IN	AI PB Chrominance level adjustment input												
103	I	SLTR MM	Slowtracking adjustment input												
104	I	AV MODE SEL	TV/VTR switch setting <table><tr><td>INPUT VOLTAGE</td><td>SWITCH</td></tr><tr><td>MORE THAN 3.0V</td><td>TV/VTR</td></tr><tr><td>2.0V~3.0V</td><td>NO SW</td></tr><tr><td>LESS THAN 2.0V</td><td>AV LINK</td></tr></table>	INPUT VOLTAGE	SWITCH	MORE THAN 3.0V	TV/VTR	2.0V~3.0V	NO SW	LESS THAN 2.0V	AV LINK				
INPUT VOLTAGE	SWITCH														
MORE THAN 3.0V	TV/VTR														
2.0V~3.0V	NO SW														
LESS THAN 2.0V	AV LINK														

Fig. MP4

Pin Number	Input/Output	Port Name	Function																																				
105	I	TRACKING ENVE	Playback envelope input for tracking adjustment																																				
106	I/O	EDIT TRIG	Trigger signal in/output for synchronized editing																																				
107	O	2H (H)	This port supplies the high signal in SP mode.																																				
108	O	T SNS LED (L)	Sensor LED drive signal output ● When this port supplies the low signal, the sensor LED is lit.																																				
109	I/O	PREROLL	Preroll signal in/output for synchronized editing.																																				
110	O	SYSTEM 2	Refer to Fig. MP. 6																																				
111	O	SYSTEM 1	Refer to Fig. MP. 6																																				
112	I/O	HIFI/MIX/NORM	Audio output mode control <table><tr><td></td><td colspan="4">MODE</td></tr><tr><td></td><td>STEREO</td><td>L CH</td><td>R CH</td><td>NORMAL</td></tr><tr><td>HIFI/MIX/NORM</td><td>H</td><td>H</td><td>H</td><td>L</td></tr><tr><td>L CH/R CH/STEREO</td><td>L</td><td>H</td><td>Z</td><td>L</td></tr></table> Z: HIGH IMPEDANCE		MODE					STEREO	L CH	R CH	NORMAL	HIFI/MIX/NORM	H	H	H	L	L CH/R CH/STEREO	L	H	Z	L																
	MODE																																						
	STEREO	L CH	R CH	NORMAL																																			
HIFI/MIX/NORM	H	H	H	L																																			
L CH/R CH/STEREO	L	H	Z	L																																			
113	O	L CH/R CH/STEREO																																					
114	I	DIGITAL 5V	VDD																																				
115	I	POSITION SW1	<table><tr><td>P. SW 3</td><td>P. SW 2</td><td>P. SW 1</td><td>Position (Mode) Name</td></tr><tr><td>O</td><td>O</td><td>O</td><td>EJECT</td></tr><tr><td>O</td><td>O</td><td>I</td><td>CASSETTE DOWN</td></tr><tr><td>O</td><td>I</td><td>O</td><td>REV, REV SLOW</td></tr><tr><td>O</td><td>I</td><td>I</td><td>MID (LOADING/UNLOADING)</td></tr><tr><td>I</td><td>O</td><td>O</td><td>PLAY/REC, STILL/PAUSE, CUE, FWD SLOW STOP3 *1</td></tr><tr><td>I</td><td>O</td><td>I</td><td>STOP</td></tr><tr><td>I</td><td>I</td><td>O</td><td>FF/REW</td></tr><tr><td>I</td><td>I</td><td>I</td><td>INTERMEDIATE</td></tr></table> (*1) The Pinch Roller is on the capstan motor shaft.	P. SW 3	P. SW 2	P. SW 1	Position (Mode) Name	O	O	O	EJECT	O	O	I	CASSETTE DOWN	O	I	O	REV, REV SLOW	O	I	I	MID (LOADING/UNLOADING)	I	O	O	PLAY/REC, STILL/PAUSE, CUE, FWD SLOW STOP3 *1	I	O	I	STOP	I	I	O	FF/REW	I	I	I	INTERMEDIATE
P. SW 3	P. SW 2	P. SW 1	Position (Mode) Name																																				
O	O	O	EJECT																																				
O	O	I	CASSETTE DOWN																																				
O	I	O	REV, REV SLOW																																				
O	I	I	MID (LOADING/UNLOADING)																																				
I	O	O	PLAY/REC, STILL/PAUSE, CUE, FWD SLOW STOP3 *1																																				
I	O	I	STOP																																				
I	I	O	FF/REW																																				
I	I	I	INTERMEDIATE																																				
116	I	POSITION SW2																																					
117	I	POSITION SW3																																					
118	O	AUDIO MODE SELECT	Audio mode switching signal output																																				
119	I	GND	GND																																				
120	I	REC WIDE (H)	This port is high during wide recording mode.																																				
121	O	WIDE (H)	This port is high during playback the tape recorded with wide mode.																																				
122	O	AI MES (H)	This port is high when measuring the head and tape condition to determine the optimum recording current before starting the AI recording.																																				
123	O	POWER OFF (H)	Power on/off control																																				
124	O	TRICK (L)	This port is low during special playback (CUE, REV, SLOW, STILL) mode.																																				

Fig. MP5

	MODE 1	MODE 2	MODE 3	MODE 4
PIN 111 (SYSTEM 1)	H: MESECAM L: PAL Z: AUTO	H: MESECAM L: PAL	H: PAL L: NTSC Z: AUTO	H: MESECAM L: PAL Z: AUTO
PIN 110 (SYSTEM 2)	H: EXCEPT NTSC L: NTSC-M	H: SECAM L: PAL Z: AUTO	—	H: EXCEPT NTSC L: NTSC-M
PIN 34 (SYSTEM 3)	H: NORMAL L: DBS/CANAL	H: NORMAL L: DBS/CANAL	—	H: NORMAL L: DBS/CANAL
PIN 35 (SYSTEM 4)	H: PAL-I L: B/G/D/K	H: SECAM L: PAL	—	H: PAL-I L: B/G/D/K
PIN 36 (SYSTEM 5)	H: PAL L: NTSC	H: PAL L: NTSC	H: 50Hz L: 60Hz	H: PAL L: NTSC

Z: HIGH IMPEDANCE

Fig. MP6

Note: 1. The mode is decided depend on SYSTEM SELECT PORT (PIN 97).

1-3-7. AI (ARTIFICIAL INTELLIGENCE) FUNCTION

The recording and playback are adjusted to achieve optimum picture quality from tapes with varying characteristics.

(1) Detail explanation

<Playback mode>

The picture quality is varying from the different tapes as follows:

- 1) If the output level is low, from worn or rental cassette tapes, a soft picture is obtained by the RF equalizer and picture control on the Lumi./Chro. Pack C.B.A.
- 2) If the output level is medium, from normal tapes, a sharp picture is obtained from the emphasis and picture control on the Lumi./Chro. Pack C.B.A.
- 3) If the output level is high, from HG/S tapes, a sharp and detailed picture is obtained from the RF equalizer, emphasis picture control and noise canceller on the Lumi./Chro. Pack C.B.A.

<Recording mode>

The optimum recording level is used for all head conditions and for all types of tapes.

- 1) The luminance S/N is boosted 2 dB.
- 2) Recording head wear compensation.
- 3) The optimum recording current is achieved in 1.5 seconds.