

RC1406901 (Falcon & Skyhawk) Universal RF Remote

Compliance Information

FCC Compliance Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to ensure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada Compliance Statement

ICES-003 This Class B digital apparatus complies with Canadian ICES-003.

RSS 210, Low Power Licence-Exempt Radiocommunications Devices (All Frequency Bands)

Cet appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada.

RSS 210, Dispositifs de radiocommunications de faible puissance, exempts de licence (pour toutes les bandes de fréquences)

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1. Introduction

1.1 Purpose of this document

The purpose of this document is to identify the requirement of RF Remote Control RC1406901. This document describes the software requirements of this remote.

1.2 Edition history

Version	Status	Date	Author	Modification(s)
1.0	Approved	12/5/2003	PCNL	Initial version as in URS

1.3 Definitions, acronyms and abbreviations

µP	Microprocessor
OTP	One Time Programmable
ROM	Read Only Memory
EEPROM	Electrical Erasable Programmable ROM
IR	Infra Red
RF	Radio Frequency
LED	Light Emitting Diode
RCS	Remote Control Systems
STB	Set-top box
TV	Television
OEM	Original Equipment Manufacturer

1.4 Reference documents

[RCMM RF/IR EXT]	Title	IR-Protocol for Wireless Multimedia Remote Control
	Document ID	SD-0000-JWO20
	Author	Johan Wouters
	Publisher	Philips RCS
	Version	2.2
	Date	10/07/2000
[URS]	Title	Key_3b
	Document ID	Key_3b.xls
	Author	Koji Harada
	Publisher	Onkyo
	Version	
	Date	26-04-2003
[Sheet_190]	Title	Electrical Specification
	Document ID	
	Author	HS Tan
	Publisher	RCS
	Version	
	Date	

[PB]	Title	Project Brief
	Document ID	
	Author	Erik
	Publisher	RCS
	Version	
	Date	

2. General product description

2.1 Product perspective

The RC1406901 is an Universal RF remote control for AV Receiver. The remote control will sends command code via a 433MHz RF link usable in US, Canada, Australia and EU market. For proper operation, RC1406901 will need to pair with a RF extender which will translate RF command to IR signal and send the IR signal to an IR receiving of AV Receiver equipment.

RC1406901 contains a dedicated code for AMP, CD, Net-Tune and MD mode, universal code for DVD, SAT, TV, VCR and CABLE mode. The RF database cover US, Canada, Australia, Asia, Japan and EU market.

1 MODE button, 3 SELECTOR buttons and 1 MACRO button are all back-lighted by green LED. The jog switch is use for menu selection and confirmation of user preference that is display in the LCD panel.

Model:

Falcon

Skyhawk

(These picture are for indication only, actual ID please refer to graphic passport)

3. Functional requirements

When the remote is inserted batteries for the the very first time or after a RESET key combination is activated, the RC1406901 will start-up in AMP mode.

Default universal ID for TV, VCR and DVD is:

Mode	Default Device	Universal ID code
AMP	Dedicated	--
CD	Dedicated	--
DVD 1 (Preset code)	NEC DVD	1234
NET-TUNE	Dedicated	--
TV	No code	0000
VCR	No code	0000
CDR	Dedicated	--
CABLE	No code	0000
MD	Dedicated	--
SATELLITE	No code	0000

Note : To get to DVD2 user need to set universal ID code of DVD to 1235

3.1 Function Overview

The features of RCXXXX can be summarised as follows:

5 back-lighted buttons (1 mode, 3 Selector & 1 Macro)

2 Indicating LED (Red > transmit IR, Green > transmit RF)

Learnable

Data Backup to and from computer

Normal operation

Mode and Selector Setting

Mode change

Selector change

Customise Operation

Preprogram

Learning

Learn Macro

Mode Edit

Setup

IR/RF selection

LCD Display

Macro Keys

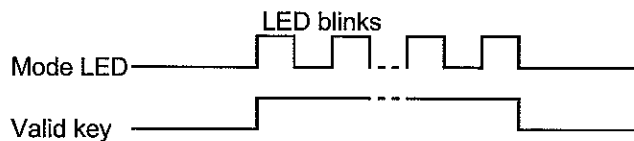
*Stuck key Timeout**Simultaneous Keypress**Factory Test mode**Universal for IR USA & Canada, EU, Australia, New Zealand, Asia and Japan for devices of DVD,SAT,TV, VCR, and CABLE Library**Universal for RF USA & Canada, EU, Australia and New Zealand for devices of DVD,SAT,TV, VCR, and CABLE Library*

3.2 Indicator LED operation

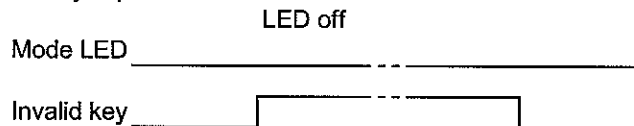
Visible LEDs are used for user feedback for confirmation of key presses located at the top of the remote.

3.2.1 RF or IR Sending Indication

When a key (other than mode keys) is press, and if this key triggers a command to be transmitted – the indicating LEDs located at the top of the remote will blinks for the duration of transmission. The blinking frequency of LED depending on the code sends by RC1406901. When transmitting RF signal Green LED will blink. When transmitting IR signal Red LED will blinks.



If a key is press and there is no command to be transmitted, the mode LED will remains off.



3.2.2 Mode, Selector (Input, Zone2) and Macro key

Each of the keys have a green LED under it. When any of the key is press and released the LED under the pressed key is turn ON. While the LED under the key is ON, if the key is press again the LED under that key will turn off. The LED under the key will also turn off when time-out occur. Under normal operation while both MODE LED and INPUT LED is off, if Jog dial is scroll both the MODE and INPUT LED will turn on. Input is pressed while both Mode and Input LED are ON, Input LED is still on and Mode LED turns OFF.

3.2.3 Time-Out

Light, Mode and Selector key ("Input", "Zone2") have 7 second time out. When 7 second duration has elapsed after the Mode or Selector key is release, the remote will exit the current state. For the Light key, once it is press the backlight will turn on, after the light key is release if there is no key press or scroll for 7 second the backlight will turn off.

Time out for features in Customize mode is 30seconds.

3.2.4 Unassigned Keys

The remote control shall ignore any unassigned key presses for a particular mode and not transmit IR unless otherwise noted.

3.3 Key Function

3.3.1 MODE Key

When MODE key is pressed while MODE LED is off, MODE LED will turn on for 7 seconds.

When MODE key is pressed while MODE LED is on, MODE LED will turn off.

When MODE key is pressed continuously the MODE LED will turn on continuously until a 7 second time out occurs upon MODE key release.

When MODE key is pressed while the LED under any one of the Key number 24, 28, 29, 32 is on, the LED under the key number 24, 28, 29, 32 that is on will turn off, and MODE LED will turn on for 7 seconds.

When other than key number 24, 28, 29, 32 key is pressed while MODE LED is on, MODE LED continues to be on for 7 seconds, and the pressed key is operated.

When Jog dial is scroll while the MODE LED is on, "MODE" can be changed, and the MODE LED will turn on for the entire process until jog is not being scroll for 7 seconds.

3.3.2 LIGHT Key

When Light key is pressed while Backlight is on, Backlight will turn off.

When Light key is pressed while Backlight is off, Backlight will turn on.

When all other than the Light key is pressed or jog is scroll while Backlight is on, Backlight will continue to turn on until 7 seconds time out occurs.

3.3.3 INPUT Key

When INPUT key is pressed while INPUT LED is off, INPUT LED will turn on for 7 seconds.

When INPUT key is pressed while INPUT LED is on, INPUT LED will turn off.

When INPUT key is pressed continuously the INPUT LED will turn on continuously until a 7 second time out occurs upon INPUT key release.

When INPUT key is pressed while the LED under any one of the Key number 24, 28, 29, 32 is on, the LED under the key number 24, 28, 29, 32 that is on will turn off, and INPUT LED will turn on for 7 seconds.

When other than key number 24, 28, 29, 32 key is pressed while INPUT LED is on, INPUT LED continues to be on for 7 seconds, and the pressed key is operated.

When Jog dial is scroll while the INPUT LED is on, "INPUT" selector can be changed, and the INPUT LED will turn on for the entire process until jog is not being scroll for 7 seconds.

3.3.4 ZONE 2 Key

When ZONE 2 key is pressed while ZONE 2 LED is off, ZONE 2 LED will turn on for 7 seconds.

When ZONE 2 key is pressed while ZONE 2 LED is on, ZONE 2 LED will turn off.

When ZONE 2 key is pressed continuously the ZONE 2 LED will turn on continuously until a 7 second time out occur upon ZONE 2 key release.

When ZONE 2 key is pressed while the LED under any one of the Key number 24,28,29,32 is on, the LED under the key number 24, 28, 29, 32 that is on will turn off, and ZONE 2 LED will turn on for 7 seconds.

When other than key number 24, 28, 29, 32 key is pressed while ZONE 2 LED is on, ZONE 2 LED continues to on for 7 seconds, and the pressed key is operated.

When Jog dial is scroll while the INPUT LED is on, "INPUT" selector can be changed, and the INPUT LED will turn on for the entire process until jog is not being scroll for 7 second.

When the other valid keys are pressed while ZONE 2 LED is on, the command of ZONE 2 is added ahead of the command of the key that is being pressed, and then they are transmitted.

When the following code is 1a, it is set to 1c, and when the following code is 1b, it is set to 1d. (Refer to 'Code table' of the device.)

No code is transmitted when ZONE 2 key is press or if no key is press after pressing the ZONE 2 key.

3.3.5 Punch through TV key (key number 3, 4, 5, 6, 7, 8)

These six buttons can transmit the unique command regardless of the current Mode. These buttons are dealt with as a clone of the button of the TV (not TV2, TV3, ... , TVn) Mode.

The relation of a clone is as follows.

Key number 3 will punch through to key number 1 in TV mode.

Key number 4 will punch through to key number 37 in TV mode.

Key number 5 will punch through to key number 33 in TV mode.

Key number 6 will punch through to key number 34 in TV mode.

Key number 7 will punch through to key number 35 in TV mode.

Key number 8 will punch through to key number 36 in TV mode.

If TV mode is deleted by the Mode edit menu, no command is transmitted when these keys are press and no command is to be learn into these keys.

The Mode of the remote will not change when these keys are pressed.

3.3.6 Macro Key

When Macro Key is pressed while Macro LED is off, Macro LED will turns on.

While Macro LED is on the stored Macro is selected by scrolling Jog dial, and the selected Macro is transmitted by pressing the Jog dial.

A maximum of eight Macro can be stored into the remote controller.

A maximum of eight commands can be stored into each Macro.

After a series of commands are sent, "Macro" LED turns off immediately.

When any key is pressed while a series of commands are sent, they are interrupted and the pressed key is operated.

Please refer to section **3.7.4 Macro Transmission** for activating Macro transmission and refer to section **3.8.3 Macro Menu** for detail programming sequence.

3.3.7 Jog Switch

The Jog switch is for user to do selection on the item display in the LCD by scrolling upward or downward. Single code transmission is apply when Jog dial is scroll upward or downward, continuous transmission only apply when jog dial switch is being press continuously.

If Jog is scroll one step at a time, that is each step is longer than 110ms or 220ms (depending on the type of protocol the remote is sending) then Input code will be transmitted as the jog is being scroll.

If more than one step change is detected within 110ms or 220ms (depending on the type of protocol the remote is sending) then no code is transmitted until the Jog stop scrolling.

3.4 IR Learn Mode

3.4.1 Entering the Learn mode

Press and hold the CUSTOM button for 3 seconds or longer will go into the customize mode then use Jog dial to go into Learn menu (refer to section 3.8 for pictorial description) When in the Learn menu, first use the Jog dial to select the desired device mode then select the key that need to learn. Please refer to section **3.8.2 Learning Menu** for detail learning sequence. ALL have Learn mode. However if batteries voltage is below normal level as defined in [Sheet_190], entering Learn mode is not possible.

3.4.2 Exiting the Learn Mode

At any moment in the Learn mode, to exit the learn mode either by pressing the Custom button or when 30second time out occur, user will exit the Learn mode.

3.5 Backlight

The Backlight is activated by a key at the side of the remote. If this key is pressed while backlight is OFF, then backlight will turn ON for 7 second upon key release. If this key is press while Backlight is ON, then Backlight will turn OFF. If all other than the backlight key is pressed or scrolled while Backlight is ON, Backlight continues to turn on for 7 seconds longer after all key release or jog dial stop activated.

3.6 LCD Display

3.6.1 Normal Display

Upper	T	A	P	E	1	: Input, Zone2 and Zone3 select
Lower	A	M	P			: Mode display

3.6.1.1 Mode Display

L	A	M	P			: AMP
L	C	D				: CD
L	D	V	D			: DVD
L	N	E	T	-	T	: Net-Tune
L	T	V				: TV
L	V	C	R			: VCR
L	C	B	L			: Cable
L	S	A	T			: Satellite
L	M	D				: MD
L	C	D	R			: CDR
L	D	V	D	2		: plural DVD
L	T	V	4			: plural TV

3.6.1.2 Selector Display >> INPUT, Zone2

U	D	V	D			: DVD
U	V	1				: Video 1
U	V	2				: Video 2
U	V	3				: Video 3
U	V	4				: Video 4
U	V	5				: Video 5
U	T	U	N	E	R	: Tuner
U	P	H	O	N	O	: Phono
U	T	A	P	E		: Tape
U	C	D				: CD
U	M	S	R	V		: Music Server
U	I	R	D			: Internet Radio

3.6.1.3 Macro Display

U	M	A	C	R	O	:	(Macro)
L	1					:	Macro 1
L	2					:	Macro 2
L	3					:	Macro 3
L	4					:	Macro 4
L	5					:	Macro 5
L	6					:	Macro 6
L	7					:	Macro 7
L	8					:	Macro 8
L	N	O	N	E		:	All Macros are empty
L	A		O	F	F	:	named Macro

3.6.2 Custom Display

See section '3.8. Custom operation and display (Customizing mode)

3.6.3 Battery Low

U						:	
L	B	A	T	T		:	Low battery (Display permanently when some key is pressed)

3.7 Normal Operation

d: Scroll downward

direction of digit : 0, 1, 2, ..., 9, 0

direction of character : A, B, ..., Y, Z, 0, 1, 2, ..., 8, 9, +, -, =, <, >, /, "Reverse Slant", *, "Space", A

u: Scroll upward

direction of digit : 0, 9, 8, ..., 1, 0

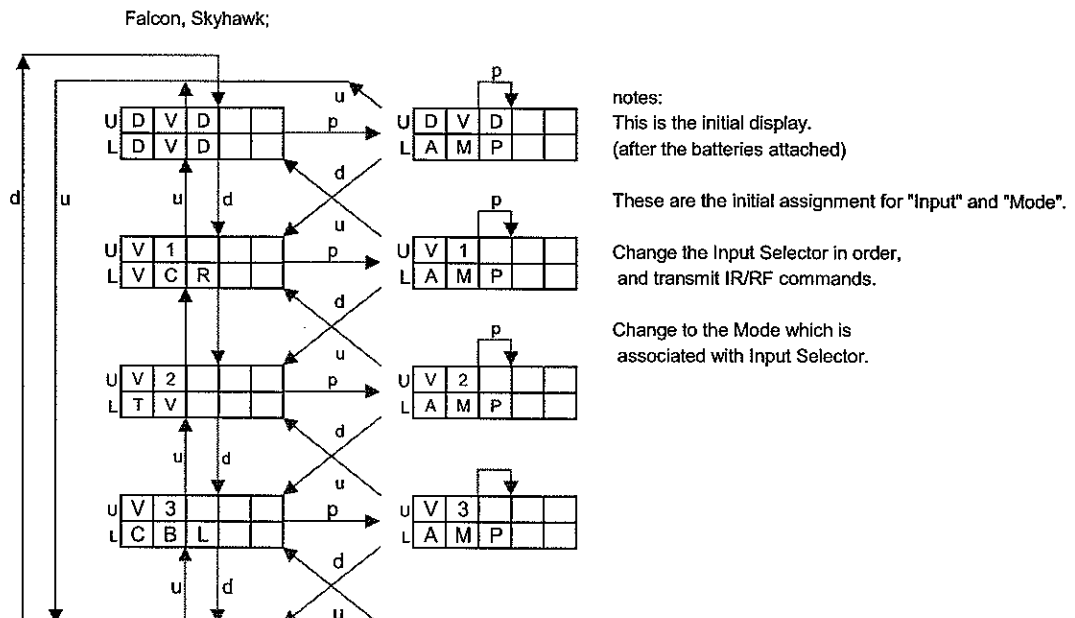
direction of character : A, "Space", *, "Reverse Slant", /, -, >, <, =, -, +, 9, 8, ..., 2, 1, 0, Z, Y, ..., B, A

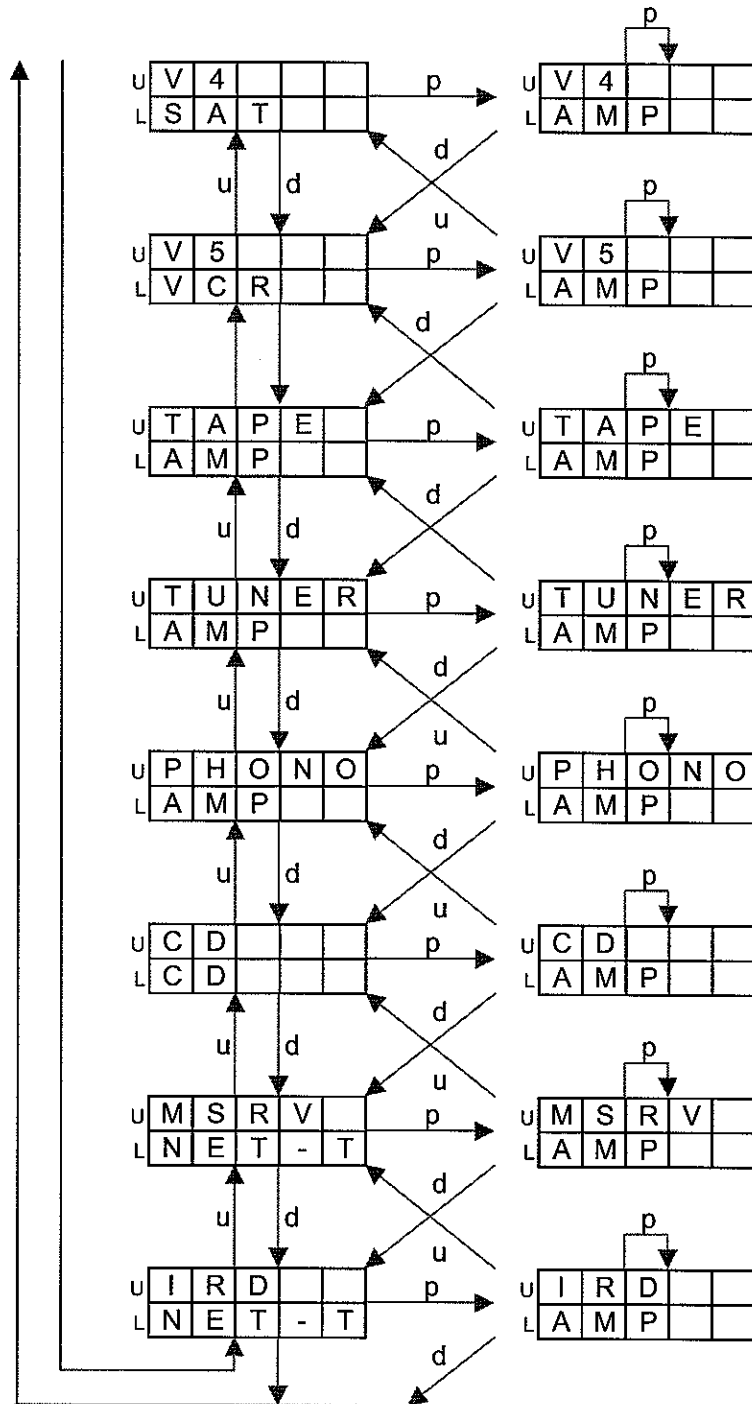
p: Press jog dial Go to AMP Mode and transmit the commands of the Input or Zone 2 selector Mode and Input Selector changing

3.7.1 Mode and Input Selector Changing

While both the "Mode" LED and the "Input" LED are OFF, if the jog dial is scroll upward or downward then both the Mode and Input selector will changed simultaneously and the LED under this 2 keys will turn ON immediately.

While both the "Mode" LED and the "Input" LED are ON, if the jog dial is scroll upward or downward the Mode and Input selector will also changed simultaneously, and the LED under this 2 keys will continue to ON. The LED will turn OFF when 7 second time out occur.

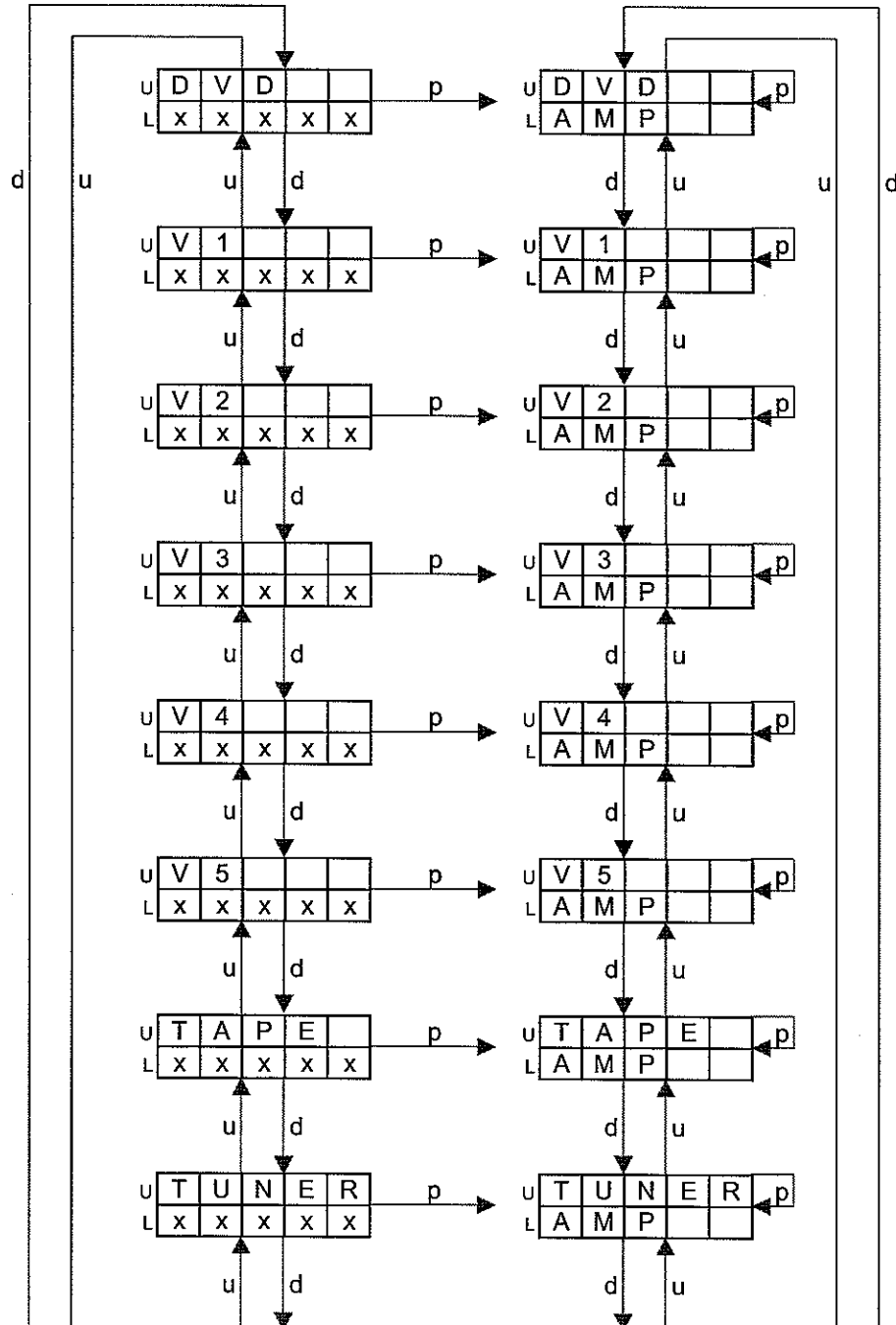


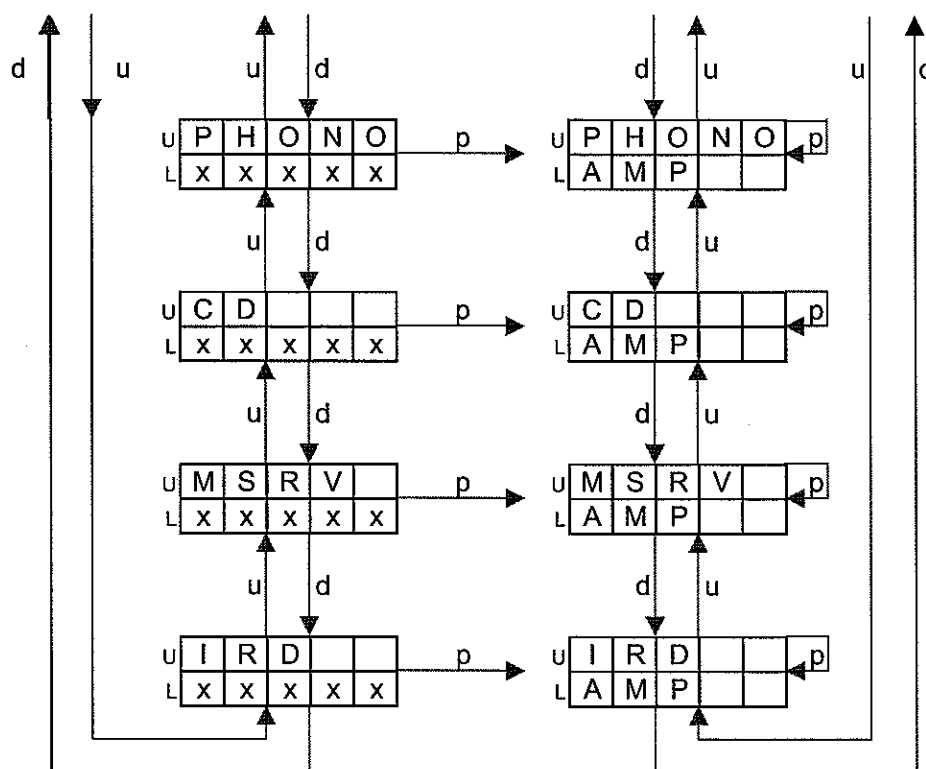


3.7.2 Input and Zone2 Selector

While only "Input" or "Zone 2" LED is on by pressing "Input" or "Zone 2" button, only Input or Zone 2 Selector is changed when jog dial is activated, and the selector LED is still on.

Falcon, Skyhawk;





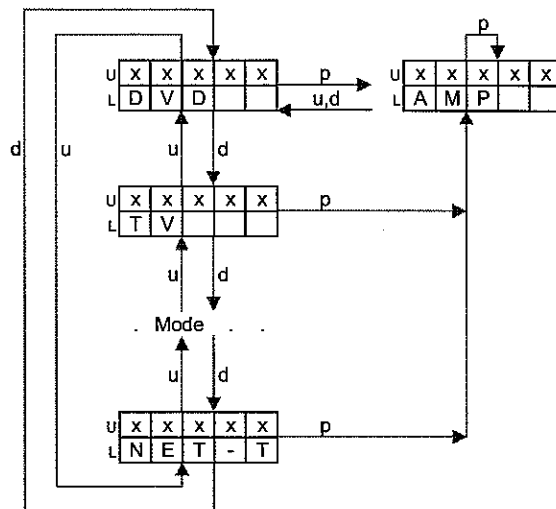
notes:

In case of Zone 2 selector is press, the upper display shows Input selector after their LED turns off. The Input order is as follows.

DVD, V1, V2, V3, V4, V5, TAPE, TUNER, PHONO, CD, MSR, V, IRD

3.7.3 Mode Change

While only "Mode" LED is on by pressing "Mode" button, only Mode is changed when jog dial is activated, and Mode LED is still on.



notes:

Input Selector is not changed.

Change the Mode in order.

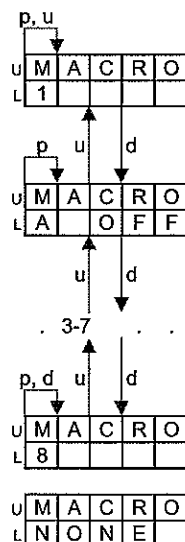
The initial Mode order is as follows.

DVD, TV, VCR, CBL, SAT, CD, MD, CDR, NET-T

3.7.4 Macro transmitting

While the "Macro" LED is on by pressing "Macro" button, the stored Macro is selected by scrolling Jog dial.

While the "Macro" LED is on, the selected Macro is transmitted by pressing Jog dial.



notes:

While a series of commands are transmitted by pressing each "MACRO" button, the transmission is interrupted if a certain button is pressed, then the pressed button operates.

If a series of commands transmission is completed, MACRO LED turns off, and it returns to Normal display.

Empty Macro is jumped and not displayed.

If all Macros are empty, show as follows for two seconds, then go back to Normal display.

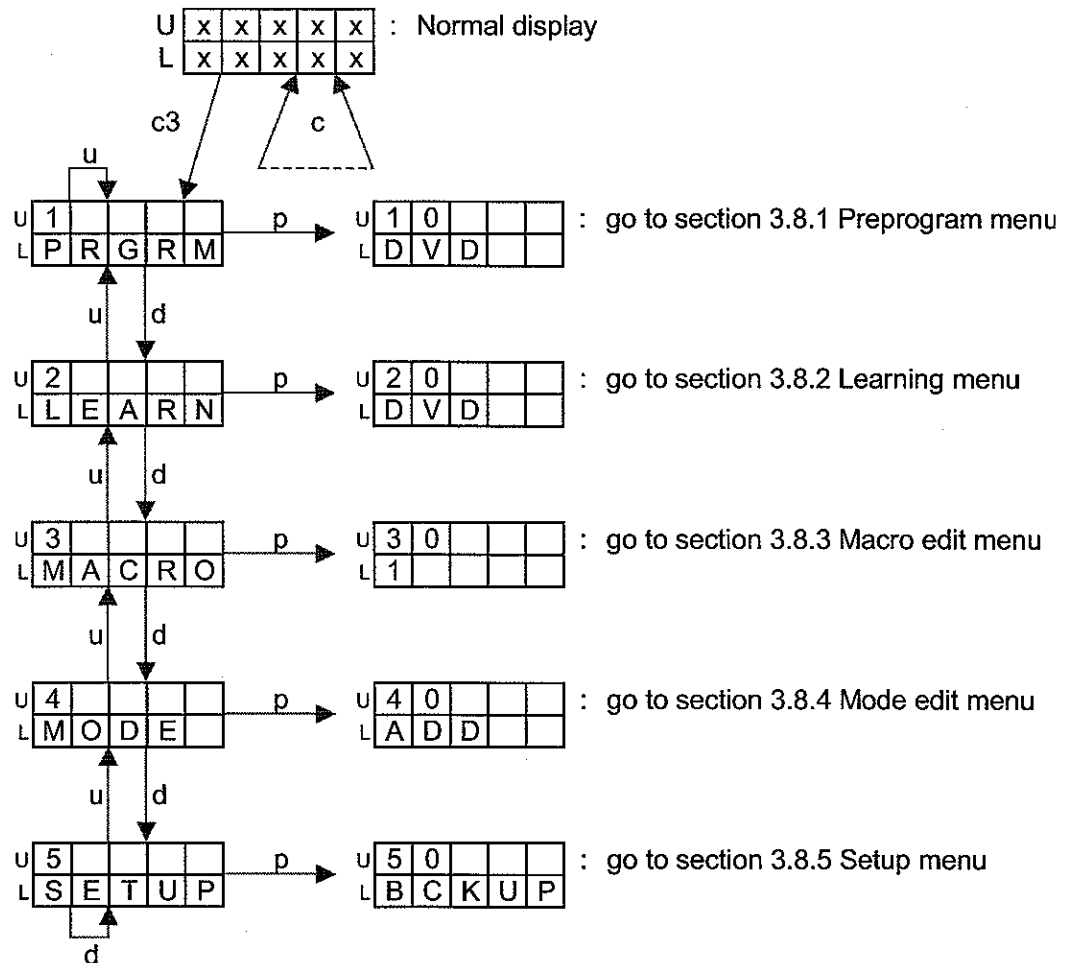
3.8 Custom operation and display (Customizing mode)

Pressing "CUSTOM" button for three seconds, the remote goes into Customizing mode.

Pressing "CUSTOM" button or no operation for 30 seconds while Customizing mode, the remote goes back to Normal display mode.

c:Press "Custom" button

c3:Press "Custom" button for three seconds



3.8.2 Learning menu

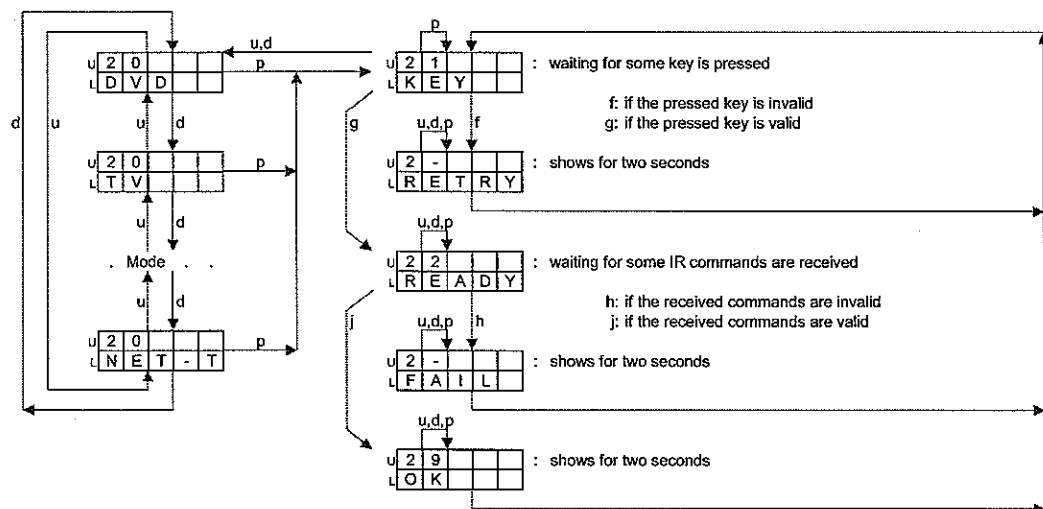
IR code of the other remote can be stored to all other than "LIGHT", "CUSTOM", "MACRO", "MODE", "INPUT" or "ZONE 2", and Jog button in every Mode.

Entering Learn Mode

- 1) Press Custom button for 3 sec to get into Customize Mode
- 2) Scroll Jog dial to select Learn Menu
- 3) Press Jog Dial to go into Learn Menu

Exit of Learning Mode:

- 1) Pressing the Custom button.
- 2) Time Out of 30second



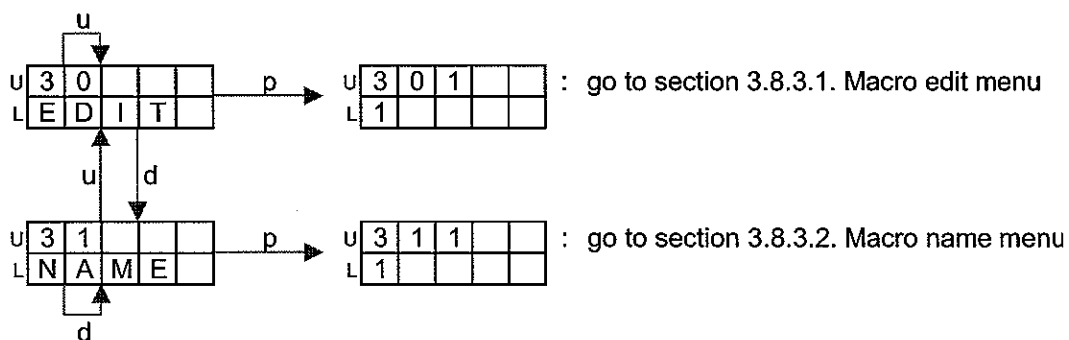
3.8.3 Macro menu

Entering Macro Mode

- 1) Press Custom button for 3 sec to get into Customize Mode
- 2) Scroll Jog dial to select Macro Menu
- 3) Press Jog Dial to go into Macro Menu

Exit of Macro Menu:

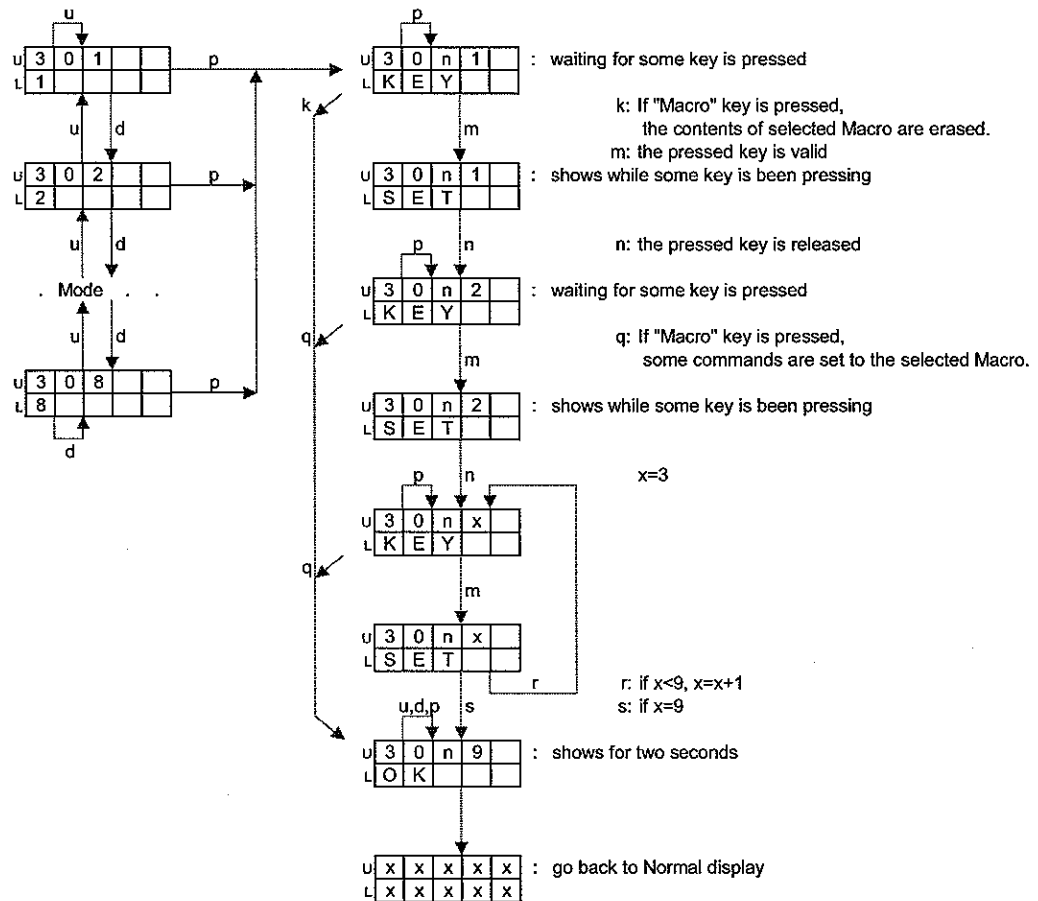
- 1) Pressing the Custom button.
- 2) Time Out of 30second
- 3) After successful Micro command programming
- 4) When Macro key is press during Macro editing



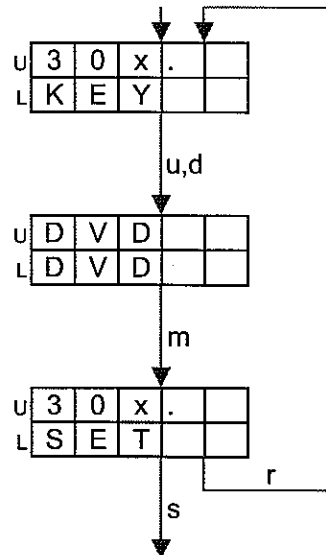
3.8.3.1 Macro Edit Menu

A maximum of eight commands can be stored into each Macro.

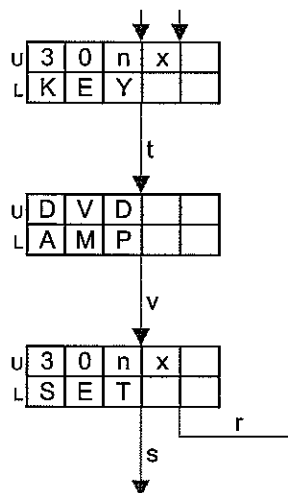
A maximum of eight Macro can be stored into the remote controller.



In case of Macro menu, "Mode", "Input" and "Zone2" buttons are operated like as Normal mode.



In case of Macro menu, how to store the "Input" and "Zone2" command is as follows.



t: scrolling the Jog dial,
or pressing "Input" or "Zone2" button,
then scrolling the Jog dial,
to change the "Input" or "Zone2" selector.

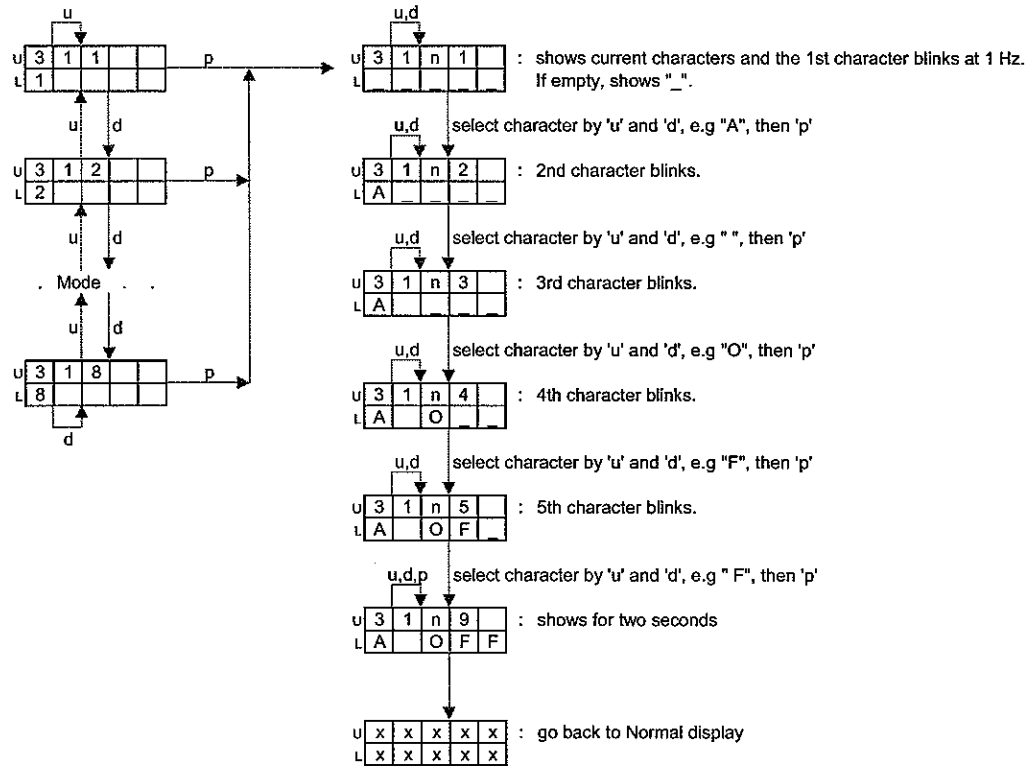
notes;

"Input" or "Zone2" selector command
is not transmitted by scrolling Jog dial in this Macro menu.

v: Pressing the Jog dial,
then "Input" or "Zone2" selector command
is stored to the Macro.
"Input" or "Zone2" selector command
is transmitted by pressing Jog dial in this Macro menu.

3.8.3.2 Macro Name Menu

The name of each Macro can be changed.



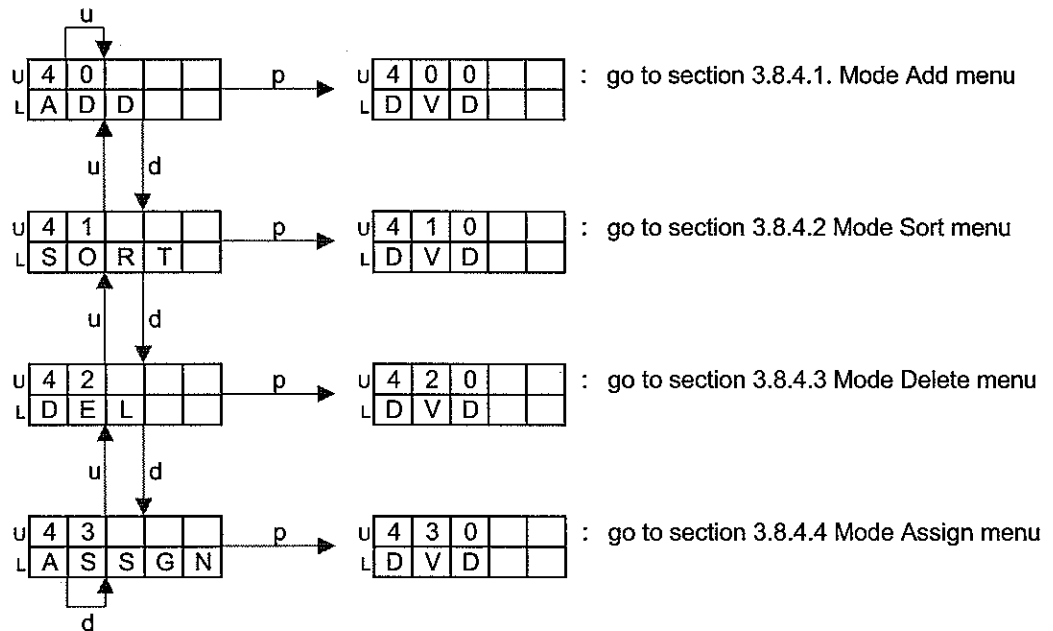
3.8.4 Mode edit menu

Entering Mode Mode

- 1) Press Custom button for 3 sec to get into Customize Mode
- 2) Scroll Jog dial to select Mode Menu
- 3) Press Jog Dial to go into Mode Menu

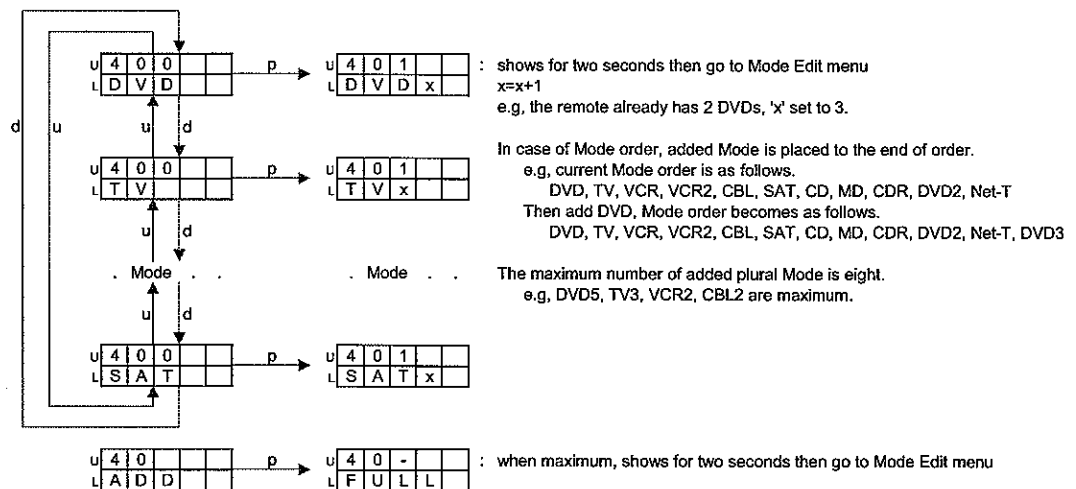
Exit of Mode Menu:

- 1) Pressing the Custom button.
- 2) Time Out of 30 second

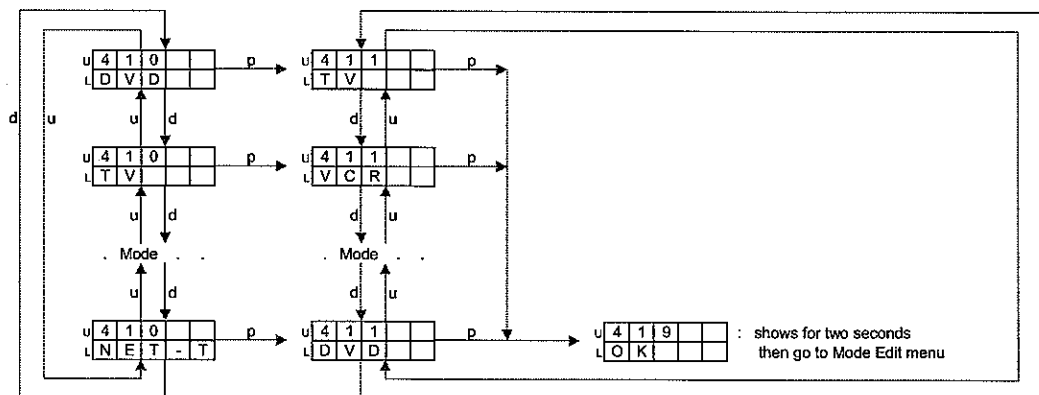


3.8.4.1 Mode Add menu

There can be more than one "DVD", "TV", "VCR", "CBL" and "SAT" Mode in the remote.



3.8.4.2 Mode Sort menu



All other than "AMP" Mode can be sorted.

In case of sorting, the first selected Mode is placed in front of second selected Mode. e.g, current Mode order is as follows.

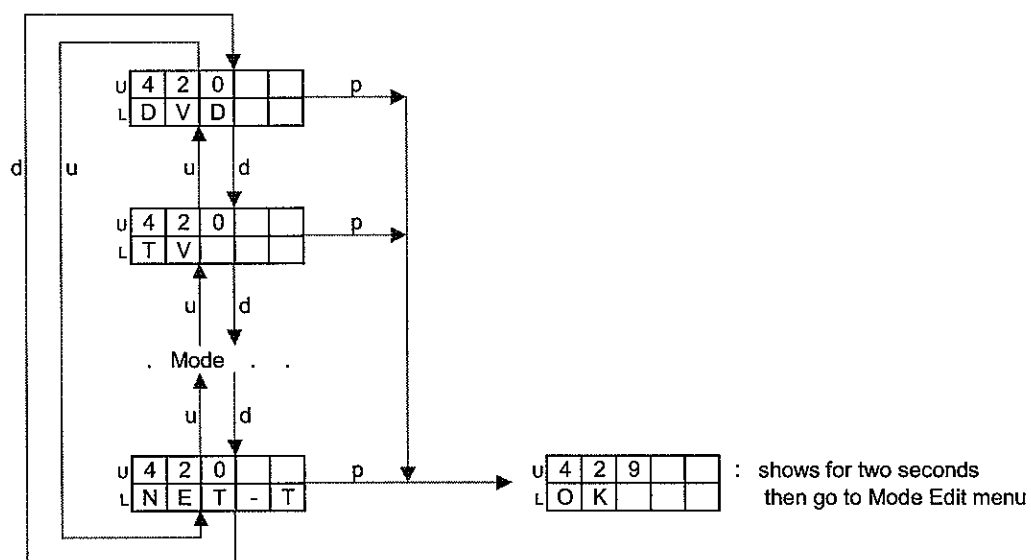
DVD, TV, VCR, VCR2, CBL, SAT, CD, MD, CDR, DVD2, Net-T

Select "VCR2" first, then select MD second, Mode order becomes as follows.

DVD, TV, VCR, CBL, SAT, CD, VCR2, MD, CDR, DVD2, Net-T

3.8.4.3 Mode Delete Menu

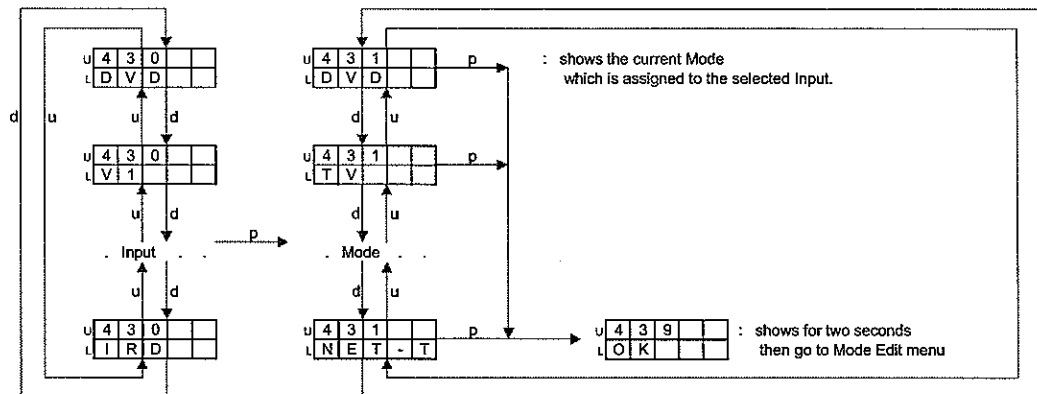
All other than "AMP" Mode can be deleted.



3.8.4.4 Mode Assigned Menu

The Mode can be assigned and changed to each input.

Therefore, if Input is changed, Mode can also be changed to the favorite Mode simultaneously.



3.8.5 Setup Menu

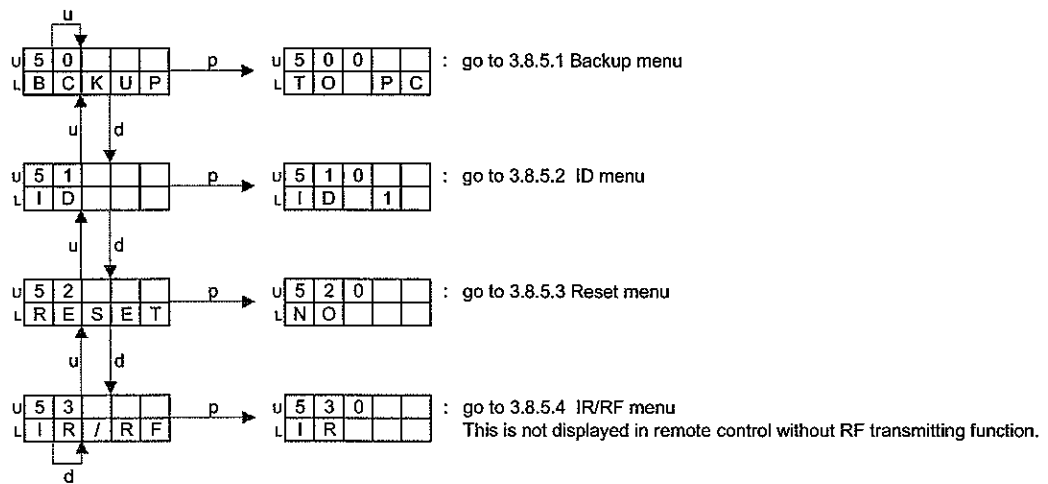
The remote setup informations can be stored to PC and restore by PC.

Entering Setup Mode

- 1) Press Custom button for 3 sec to get into Customize Mode
- 2) Scroll Jog dial to select Setup Menu
- 3) Press Jog Dial to go into Setup Menu

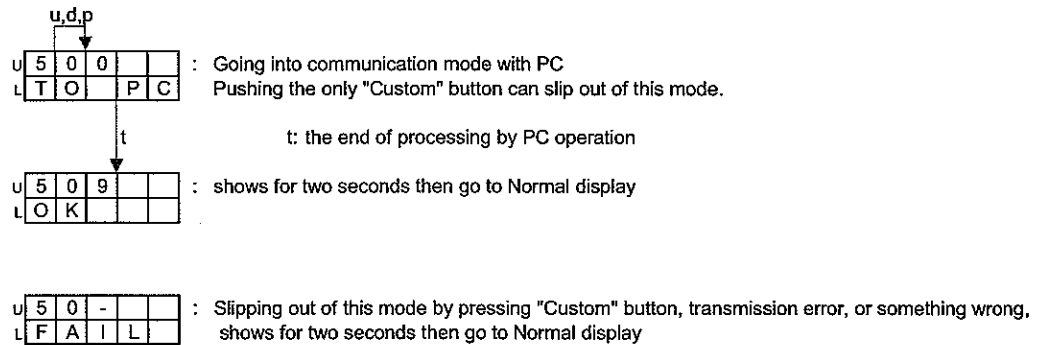
Exit of Setup Menu:

- 3) Pressing the Custom button.
- 4) Time Out of 30 second



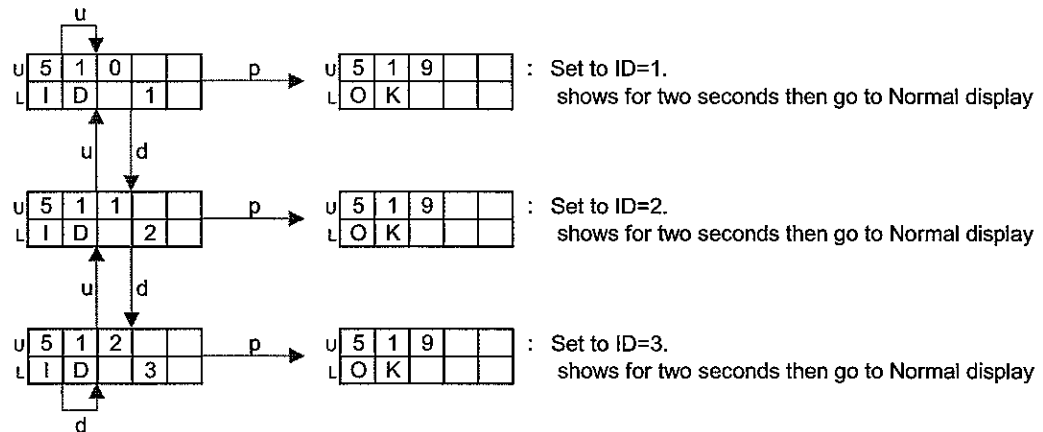
3.8.5.1 Backup Menu

The all of remote data and informations can be stored to PC and restore by PC.



3.8.5.2 ID Menu

The ID of ONKYO preset code is changed.



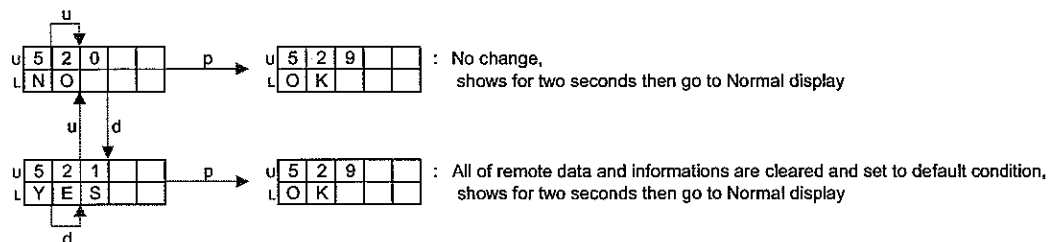
The current value is displayed first.

ID and Custom code table

ID=1	ID=2	ID=3
D202	D209	D20A
D26C	D204	D207
D2AC	D205	D208
D26D	D203	D206

3.8.5.3 Reset Menu

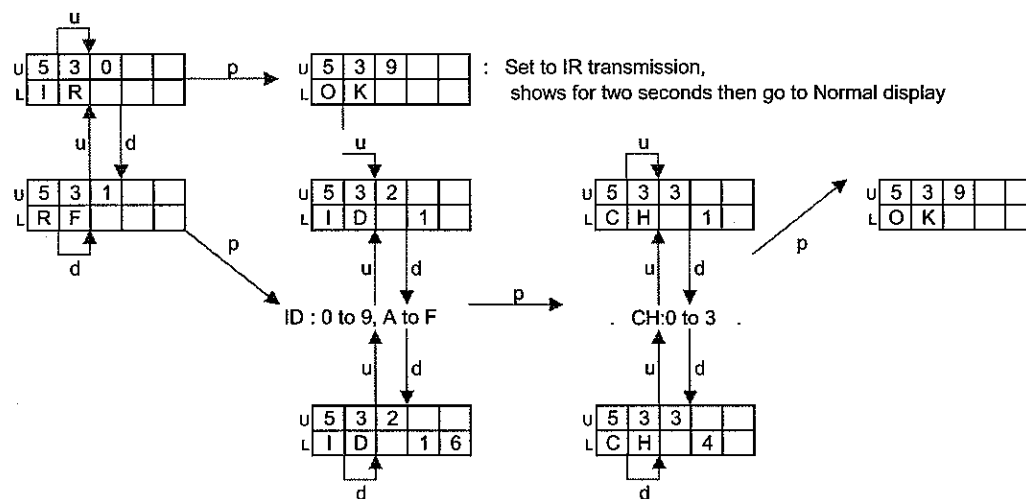
All of the remote data and informations can be cleared and set to default condition.



3.8.5.4 IR/RF Menu

Transmission can either be IR or RF.

Transmitting LED lights in red if IR is selected, transmitting LED lights in green if Rf is selected.



The current value is displayed first.

3.9 RF Home ID and Device ID Setup

The communication link between RC1406901 and Dongle is uniquely matched by a set of CH ID and Device ID – selectable by end user. The purpose of the Device ID is to prevent confusion if user has installed with more than 1 set of receiver. CH ID will avoid interference between neighbours with similar AV Receiver system installed.

CH ID consists of digit: 0, 1, 2 & 3

Device ID consists of digit: 0 to 9, A to F

Please refer to Section 3.9.5 Setup Menu to enter IR/RF menu and refer to section 3.9.5.4 IR/RF Menu to select the CH and Device ID.

3.10 Battery Low Indication

Upon power up, if the RAM has not been corrupted, the remote control will maintain the user settings (programmed IDs).

Upon power up, if RAM has been corrupted, the remote will be reset to its original default states. That is AMP will be the default mode, and each mode will have its initial default ID. Please refer to section 3 on the default table for all devices.

3.11 Power down mode

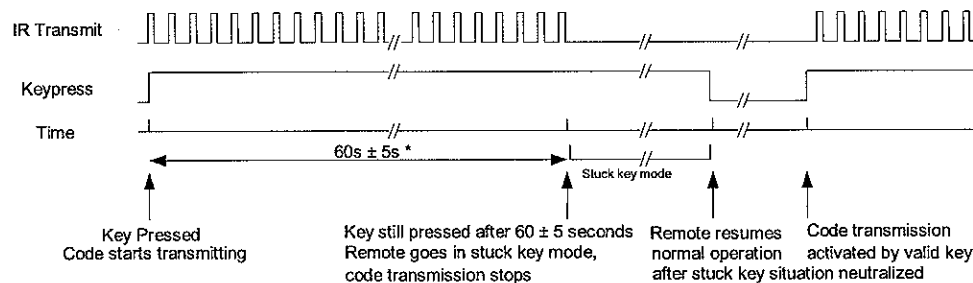
In this mode, a minimum of current is consumed to maximise battery lifetime. This mode is entered when no actions need to be executed. When the user presses a button on the keypad, normal operating mode is entered. No memory setting is lost.

3.12 Stuck Key mode

Stuck Key means that a button has been pressed for a very long time in normal operating mode. To preserve battery power, the remote will shut down about 60 seconds after the last key transition to consume minimal power. After all keys are released, the remote resumes normal operation.

Following graphic shows when this power down mode is entered:

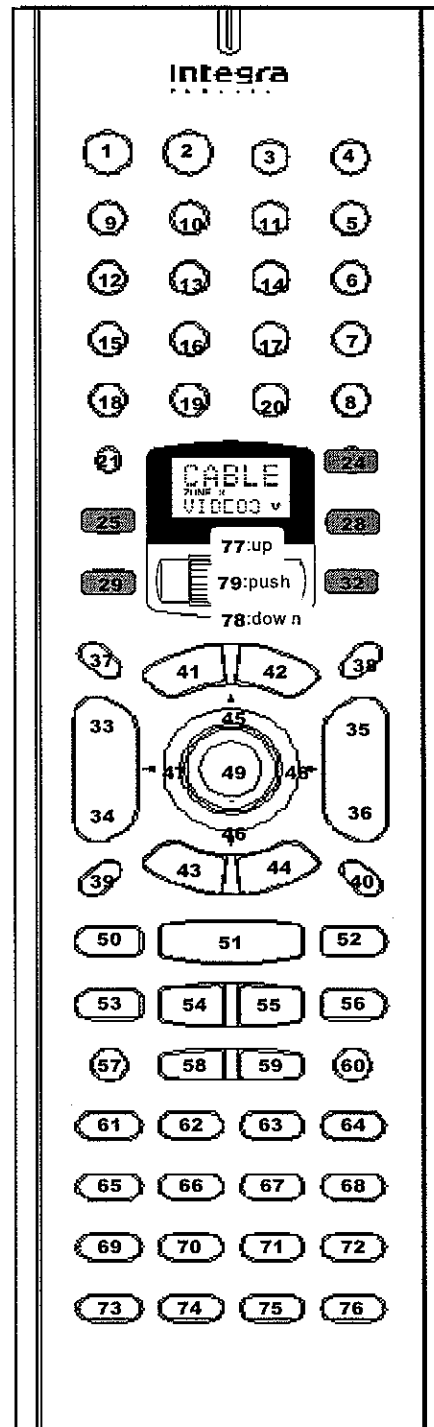
STUCK KEY TIMEOUT



* Stuck Key Timeout is typical 60 seconds, actual timing depends on the protocol transmitted

Typical stuck key time is between 55 and 65 seconds, except for IR protocols with exceptional long or short repeat timings.

3.13 Key Numbering



3.14 Function Table Overview

Code table Falcon and Skyhawk

Key No. #	Function	Prepro	Symbol	Falcon	Skyhawk
		Prepro number			
side	LIGHT			yes	yes
1	POWER ON	Power On	I	yes	yes
2	STANDBY	Power Off	⏻	yes	yes
3	TV POWER	TV Power	⏻/I	yes	yes
4	TV INPUT	TV TV/Video	INPUT	yes	yes
5	TV CH +	TV Ch +	+	yes	yes
6	TV CH -	TV Ch -	-	yes	yes
7	TV VOL +	TV Vol +	+	yes	yes
8	TV VOL -	TV Vol -	-	yes	yes
9	1 @,-/	1	1 @,-/	yes	yes
10	2 ABC	2	2 ABC	yes	yes
11	3 DEF	3	3 DEF	yes	yes
12	4 GHI	4	4 GHI	yes	yes
13	5 JKL	5	5 JKL	yes	yes
14	6 MNO	6	6 MNO	yes	yes
15	7 PQRS	7	7 PQRS	yes	yes
16	8 TUV	8	8 TUV	yes	yes
17	9 WXYZ	9	9 WXYZ	yes	yes
18	+10	+10	+10	yes	yes
	-- / ---		-- / ---	yes	yes
19	0	0	0	yes	yes
20	ENTER	Enter	ENT	yes	yes
	DIRECT TUNING		D TUN	yes	yes
21	CUSTOM		CUSTOM	yes	yes
22				no key	no key
23				no key	no key
24	ZONE 3		ZONE 3	no	no
25	MACRO		MACRO	yes	yes
26				no key	no key
27				no key	no key
28	ZONE 2		ZONE 2	yes	yes
29	MODE		MODE	yes	yes
30				no key	no key
31				no key	no key
32	INPUT		INPUT	yes	yes
33	CH +	Ch +	CH +	yes	yes
	DISC +	Step up	DISC +	yes	yes
34	CH -	Ch -	CH -	yes	yes
	DISC -	Step down	DISC -	yes	yes
35	VOL +	Vol +	VOL A	yes	yes
36	VOL -	Vol -	VOL V	yes	yes
37	DIMMER		DIMMER	yes	yes
	TV / VIDEO	TV / Video, TV / VCR	TV / VIDEO	yes	yes

Key No. #	Function	Prepro	Symbol	Falcon	Skyhawk
		Prepro number			
38	SLEEP	Sleep	SLEEP	yes	yes
39	DISPLAY PREVIOUS	Display Previous Channel	DISPLAY PREVIOUS	yes	yes
40	MUTING	Mute	MUTING	yes	yes
41	TOP MENU ASPECT	Title Aspect, Wide	TOP MENU TV ASPECT	yes	yes
42	AUDIO ADJUST MENU	(Disc) Menu	AUDIO ADJUST MENU	yes	yes
43	RETURN	Exit	RETURN	yes	yes
44	SETUP	Setup Menu, Guide	SETUP	yes	yes
45	CURSOR	Up	Λ	yes	yes
46	CURSOR	Down	V	yes	yes
47	CURSOR	Left	<	yes	yes
48	CURSOR	Right	>	yes	yes
49	ENTER	Enter Ok	ENTER	yes	yes
50	<<	(VISS Index) Previous	⏮	yes	yes
51	PLAY	Play	▶	yes	yes
52	>>	(VISS Index) Next	⏭	yes	yes
53	<<	Fast Rewind	⏮	yes	yes
54	PAUSE REVERSE PLAY	⏮	⏮	yes	yes
55	STOP	⏮	⏮	yes	yes
56	>>	⏭ Forward	⏭	yes	yes
57	REC LAST PLAY	⏮ Last Play	⏮ Last Play	yes	yes
58	<	⏮ Slow Rewind	⏮	yes	yes
59	>	⏭ Slow Forward	⏭	yes	yes
60	RANDOM	Shuffle (One)	RANDOM	yes	yes
61	SURROUND AUDIO	◀ Audio	SURR AUDIO	yes	yes
62	THX ANGLE	▶ Angle	THX ANGLE	yes	no
63	ALL CH STEREO SUBTITLE	Language	ALL ST SUBTITLE	yes	yes
64	STEREO CLEAR	(Memo) Clear	STEREO CLEAR	yes	yes
65	PURE AUDIO REPEAT	Repeat	PURE A REPEAT	yes	yes
66	DIRECT A-B	Repeat A-B	DIRECT A-B	yes	yes
67	DSP - SEARCH	Scan	< DSP SEARCH	yes	yes
68	DSP + MEMORY	Memery, Program	DSP > MEMORY	yes	yes
69	TEST PLAYLIST		TEST PLAYLIST	yes	yes
70	CH SEL ALBUM		CH SEL ALBUM	yes	yes
71	LEVEL - ARTIST		< LEVEL ARTIST	yes	yes
72	LEVEL + GENRE		LEVEL > GENRE	yes	yes
74	EJECT OPEN / CLOSE CAPS	Eject	⏮	yes	yes
			CAPS	yes	yes

Key No. #	Function	Prepro	Symbol	Falcon	Skyhawk
		Prepro number			
73	AUDIO SELECTOR DELETE		A SEL DEL	yes	yes
75	LATE NIGHT LANGUAGE		L NIGHT LANGUAGE	yes	yes
76	Re-EQ LOCATION		Re-EQ LOCATION	yes	yes
77	Scrolling Jog upward			yes	yes
78	Scrolling Jog downward			yes	yes
79	Pressing Jog			yes	yes
	Input DVD		DVD	yes	yes
	Input VIDEO 1		V1	yes	yes
	Input VIDEO 2		V2	yes	yes
	Input VIDEO 3		V3	yes	yes
	Input VIDEO 4		V4	yes	yes
	Input VIDEO 5		V5	yes	yes
	Input VIDEO 6		V6	no	no
	Input VIDEO 7		V7	no	no
	Input CD		CD	yes	yes
	Input PHONO		PHONO	yes	yes
	Input TUNER		TUNER	yes	yes
	Input TAPE		TAPE	yes	yes
	Input TAPE 1		TAPE1	no	no
	Input TAPE 2		TAPE2	no	no
	Input MUSIC SERVER		MSRV	yes	yes
	Input INTERNET RADIO		IRD	yes	yes

Yes : key with function

No : Not implemented in this model

No key : No such key in this model

3.14.1 AMP and CD Code Table

Code table Falcon and Skyhawk

Key No. #	Function	Prepro	Symbol	AMP			CD		
				Preset Code			Preset Code		
				Custom	Data	Type	Custom	Data	Type
side	LIGHT			Light operation					
1	POWER ON	Power On	I	D26D	04	1a	D2AC	1F	1a
2	STANDBY	Power Off	⏻	D26C	47	1a	D26C	83	1a
3	TV POWER	TV Power	⏻ / I	The same as #1 of TV Mode					
4	TV INPUT	TV TV/Video	INPUT	The same as #37 of TV Mode					
5	TV CH +	TV Ch +	+	The same as #33 of TV Mode					
6	TV CH -	TV Ch -	-	The same as #34 of TV Mode					
7	TV VOL +	TV Vol +	+	The same as #35 of TV Mode					
8	TV VOL -	TV Vol -	-	The same as #36 of TV Mode					
9	1 @- /	1	1 @- /	D202	D5	1a	D26D	D5	1a
10	2 ABC	2	2 ABC	D202	D6	1a	D26D	D6	1a
11	3 DEF	3	3 DEF	D202	D7	1a	D26D	D7	1a
12	4 GHI	4	4 GHI	D202	D8	1a	D26D	D8	1a
13	5 JKL	5	5 JKL	D202	D9	1a	D26D	D9	1a
14	6 MNO	6	6 MNO	D202	DA	1a	D26D	DA	1a
15	7 PQRS	7	7 PQRS	D202	DB	1a	D26D	DB	1a
16	8 TUV	8	8 TUV	D202	DC	1a	D26D	DC	1a
17	9 WXYZ	9	9 WXYZ	D202	DD	1a	D26D	DD	1a
18	+10 -- / ---	+10	+10 -- / ---				D26D	DF	1a
19	0	0	0	D202	DE	1a	D26D	DE	1a
20	ENTER DIRECT TUNING	Enter	ENT D TUN	D202	DF	1a			
21	CUSTOM		CUSTOM	Custom operation					
22									
23									
24	ZONE 3		ZONE 3	D202	5E	1c/1d	Zone 3 operation		
25	MACRO		MACRO	Macro operation					
26									
27									
28	ZONE 2		ZONE 2	D26D	CC	1c/1d	Zone 2 operation		
29	MODE		MODE	Mode operation					
30									
31									
32	INPUT		INPUT	Input operation					
33	CH + DISC +	Ch + Step up	CH + DISC +	D26D	00	1b	D26D	5C	1a
34	CH - DISC -	Ch - Step down	CH - DISC -	D26D	01	1b	D2AC	1E	1a
35	VOL +	Vol +	VOL Λ	D26D	02	1b	#1		
36	VOL -	Vol -	VOL V	D26D	03	1b	#2		
37	DIMMER TV / VIDEO	TV / Video, TV / VCR	DIMMER TV / VIDEO	D26D	95	1a			

Key No. #	Function	Prepro	Symbol	AMP			CD		
				Preset Code			Preset Code		
				Custom	Data	Type	Custom	Data	Type
		Prepro number					####		
38	SLEEP	Sleep	SLEEP	D26D	5D	1a			
39	DISPLAY PREVIOUS	Display Previous Channel	DISPLAY PREVIOUS	D26C	55	1a	D26C	58	1a
40	MUTING	Mute	MUTING	D26D	05	1a		#3	
41	TOP MENU ASPECT	Title Aspect, Wide	TOP MENU TV ASPECT						
42	AUDIO ADJUST MENU	(Disc) Menu	AUDIO ADJUST MENU	D26C	D4	1a			
43	RETURN	Exit	RETURN	D26C	54	1a			
44	SETUP	Setup Menu, Guide	SETUP	D26C	53	1a			
45	CURSOR	Up	⬆	D26D	82	1b			
46	CURSOR	Down	⬇	D26D	83	1b			
47	CURSOR	Left	<	D26D	84	1b			
48	CURSOR	Right	>	D26D	85	1b			
49	ENTER	Enter Ok	ENTER	D26D	97	1a			
50	<<	(VISS Index) Previous	⏮	D26D	93	1a	D26D	1E	1a
51	PLAY	Play	▶	D26D	15	1a	D26D	1B	1a
52	>>	(VISS Index) Next	⏭	D26D	94	1a	D26D	1D	1a
53	<<	Fast Rewind	⏮	D26D	1A	1a	D26D	8B	1b
54	PAUSE REVERSE PLAY	⏮	⏮	D26D	16	1a	D26D	1F	1a
55	STOP	⏮	⏮	D26D	13	1a	D26D	1C	1a
56	>>	Fast Forward	⏭	D26D	19	1a	D26D	8A	1b
57	REC LAST PLAY	⏮	⏮	D26D	18	1a			
58	<	Slow Rewind ⏮ Backward	⏮						
59	>	Slow Forward	⏭						
60	RANDOM	Shuffle (One)	RANDOM				D26C	57	1a
61	SURROUND AUDIO	⏮	SURR AUDIO	D26C	4D	1a			
62	THX ANGLE	⏮	THX ANGLE	D26C	4E	1a			
63	ALL CH STEREO SUBTITLE	Language	ALL ST SUBTITLE	D26C	52	1a			
64	STEREO CLEAR	(Memo) Clear	STEREO CLEAR	D26C	4C	1a	D26D	9E	1a
65	PURE AUDIO REPEAT	Repeat	PURE A REPEAT	D26C	D3	1a	D26C	56	1a
66	DIRECT A-B	Repeat A-B	DIRECT A-B	D26D	44	1a			
67	DSP - SEARCH	Scan	< DSP SEARCH	D26C	19	1a			
68	DSP + MEMORY	Memery, Program	DSP > MEMORY	D26C	18	1a	D26D	49	1a
69	TEST PLAYLIST		TEST PLAYLIST	D26D	9A	1a			
70	CH SEL ALBUM		CH SEL ALBUM	D26C	44	1a			
71	LEVEL - ARTIST		< LEVEL ARTIST	D26C	43	1b			
72	LEVEL + GENRE		LEVEL > GENRE	D26C	42	1b			
74	EJECT OPEN / CLOSE CAPS	Eject	⏮	D26C	D8	1a	D26D	91	1a

Key No. #	Function	Prepro	Symbol	AMP			CD		
				Preset Code			Preset Code		
				Custom	Data	Type	Custom	Data	Type
							####		
73	AUDIO SELECTOR DELETE	▲	A SEL DEL	D26C	D9	1a			
75	LATE NIGHT LANGUAGE		L NIGHT LANGUAGE	D26C	D7	1a			
76	Re-EQ LOCATION		Re-EQ LOCATION	D26C	D6	1a			
77	Scrolling Jog upward			Scrolling Jog upward operation					
78	Scrolling Jog downward			Scrolling Jog downward operation					
79	Pressing Jog			Pressing Jog operation					
	Input DVD		DVD	D26C	8C	1a			
	Input VIDEO 1		V1	D26D	0F	1a			
	Input VIDEO 2		V2	D26D	0E	1a			
	Input VIDEO 3		V3	D26D	0D	1a			
	Input VIDEO 4		V4	D26D	9F	1a			
	Input VIDEO 5		V5	D26D	9D	1a			
	Input VIDEO 6		V6	D26D	9C	1a			
	Input VIDEO 7		V7	D26C	CC	1a			
	Input CD		CD	D26D	09	1a			
	Input PHONO		PHONO	D26D	0A	1a			
	Input TUNER		TUNER	D26D	0B	1a			
	Input TAPE		TAPE	D26D	08	1a			
	Input TAPE 1		TAPE1	D26D	08	1a			
	Input TAPE 2		TAPE2	D26D	07	1a			
	Input MUSIC SERVER		MSRV	D202	88	1a			
	Input INTERNET RADIO		IRD	D202	89	1a			

#1: The same as #35 of AMP Mode

#2: The same as #36 of AMP Mode

#3: The same as #40 of AMP Mode

Preset and Learnable area
Learnable area
Preset, Prepro and Learnable area
Prepro and Learnable area
Fixed TV command area
Special operation, unable to learn

3.14.2 DVD Code Table

Code table Falcon and Skyhawk

Key No. #	Function	Prepro	Symbol	DVD					
				Preset Code					
				Custom	Data	Type	Custom	Data	Type
				####			####		
side	LIGHT			Light operation					
1	POWER ON	Power On	I	D2AC	04	1a	D22B	99	1a
2	STANDBY	Power Off	⏻	D2AC	06	1a	D22B	8C	1a
3	TV POWER	TV Power	⏻/I	The same as #1 of TV Mode					
4	TV INPUT	TV TV/Video	INPUT	The same as #37 of TV Mode					
5	TV CH +	TV Ch +	+	The same as #33 of TV Mode					
6	TV CH -	TV Ch -	-	The same as #34 of TV Mode					
7	TV VOL +	TV Vol +	+	The same as #35 of TV Mode					
8	TV VOL -	TV Vol -	-	The same as #36 of TV Mode					
9	1 @.-/	1	1 @.-/	D2AC	0E	1a	D22B	0E	1a
10	2 ABC	2	2 ABC	D2AC	0F	1a	D22B	0F	1a
11	3 DEF	3	3 DEF	D2AC	10	1a	D22B	10	1a
12	4 GHI	4	4 GHI	D2AC	11	1a	D22B	11	1a
13	5 JKL	5	5 JKL	D2AC	12	1a	D22B	12	1a
14	6 MNO	6	6 MNO	D2AC	13	1a	D22B	13	1a
15	7 PQRS	7	7 PQRS	D2AC	14	1a	D22B	14	1a
16	8 TUV	8	8 TUV	D2AC	15	1a	D22B	15	1a
17	9 WXYZ	9	9 WXYZ	D2AC	16	1a	D22B	16	1a
18	+10 --/---	+10	+10 --/---	D2AC	18	1a	D22B	18	1a
19	0	0	0	D2AC	17	1a	D22B	17	1a
20	ENTER DIRECT TUNING	Enter	ENT D TUN						
21	CUSTOM		CUSTOM	Custom operation					
22									
23									
24	ZONE 3		ZONE 3	D202	5E	1c/1d	Zone 3 operation		
25	MACRO		MACRO	Macro operation					
26									
27									
28	ZONE 2		ZONE 2	D26D	CC	1c/1d	Zone 2 operation		
29	MODE		MODE	Mode operation					
30									
31									
32	INPUT		INPUT	Input operation					
33	CH + DISC +	Ch + Step up	CH + DISC +	D2AC	0B	1a	D22B	D3	1a
34	CH - DISC -	Ch - Step down	CH - DISC -	D2AC	0C	1a	D22B	D4	1a
35	VOL +	Vol +	VOL A	#1			#1		
36	VOL -	Vol -	VOL V	#2			#2		
37	DIMMER TV / VIDEO	TV / Video, TV / VCR	DIMMER TV / VIDEO						

Key No. #	Function	Prepro	Symbol	DVD					
				Preset Code					
				Custom	Data	Type	Custom	Data	Type
				####			####		
38	SLEEP	Sleep	SLEEP						
39	DISPLAY PREVIOUS	Display Previous Channel	DISPLAY PREVIOUS	D2AC	0D	1a	D22B	06	1a
40	MUTING	Mute	MUTING		#3			#3	
41	TOP MENU ASPECT	Title Aspect, Wide	TOP MENU TV ASPECT	D26C	98	1a	D22B	4E	1a
42	AUDIO ADJUST MENU	(Disc) Menu	AUDIO ADJUST MENU	D26C	99	1a	D22B	4F	1a
43	RETURN	Exit	RETURN	D26C	9F	1a	D22B	09	1a
44	SETUP	Setup Menu, Guide	SETUP	D26C	97	1a	D22B	4D	1a
45	CURSOR	Up	▲	D26C	9A	1a	D22B	50	1a
46	CURSOR	Down	▼	D26C	9B	1a	D22B	51	1a
47	CURSOR	Left	◀	D26C	9C	1a	D22B	52	1a
48	CURSOR	Right	▶	D26C	9D	1a	D22B	53	1a
49	ENTER	Enter Ok	ENTER	D26C	9E	1a	D22B	08	1a
50	<<	(VISS Index) Previous	⏮	D26C	90	1a	D22B	1E	1a
51	PLAY	Play	▶	D26C	8D	1a	D22B	1B	1a
52	>>	(VISS Index) Next	⏭	D26C	8F	1a	D22B	1D	1a
53	<<	Fast Rewind	⏮	D26C	92	1a	D22B	0D	1a
54	PAUSE REVERSE PLAY	⏮	⏮	D26C	93	1a	D22B	1F	1a
55	STOP	⏮	⏮	D26C	8E	1a	D22B	1C	1a
56	>>	Fast Forward	⏭	D26C	91	1a	D22B	0C	1a
57	REC LAST PLAY	⏮	⏮	D26C	94	1a	D22B	49	1a
58	<	⏮	⏮	D26C	C1	1a	D22B	8F	1a
59	>	Slow Forward	⏭	D26C	C0	1a	D22B	0B	1a
60	RANDOM	Shuffle (One)	RANDOM	D2AC	0A	1a	D22B	0A	1a
61	SURROUND AUDIO	Audio	SURR AUDIO	D2AC	08	1a	D22B	55	1a
62	THX ANGLE	Angle	THX ANGLE	D2AC	09	1a	D22B	07	1a
63	ALL CH STEREO SUBTITLE	Language	ALL ST SUBTITLE	D26C	96	1a	D22B	54	1a
64	STEREO CLEAR	(Memo) Clear	STEREO CLEAR	D2AC	1C	1a	D22B	4B	1a
65	PURE AUDIO REPEAT	Repeat	PURE A REPEAT	D2AC	1A	1a	D22B	44	1a
66	DIRECT A-B	Repeat A-B	DIRECT A-B	D2AC	1D	1a	D22B	45	1a
67	DSP - SEARCH	Scan	< DSP SEARCH	D2AC	19	1a	D22B	19	1a
68	DSP + MEMORY	Memery, Program	DSP > MEMORY	D2AC	1B	1a	D22B	4A	1a
69	TEST PLAYLIST		TEST PLAYLIST						
70	CH SEL ALBUM		CH SEL ALBUM						
71	LEVEL - ARTIST		< LEVEL ARTIST						
72	LEVEL + GENRE		LEVEL > GENRE						
74	EJECT OPEN / CLOSE CAPS	Eject	⏮	D2AC	07	1a	D22B	05	1a

Key No. #	Function	Prepro	Symbol	DVD					
				Preset Code					
				Custom	Data	Type	Custom	Data	Type
		Prepro number		####			####		
73	AUDIO SELECTOR DELETE	▲	A SEL DEL						
75	LATE NIGHT LANGUAGE		L NIGHT LANGUAGE						
76	Re-EQ LOCATION		Re-EQ LOCATION						
77	Scrolling Jog upward			Scrolling Jog upward operation					
78	Scrolling Jog downward			Scrolling Jog downward operation					
79	Pressing Jog			Pressing Jog operation					

#1: The same as #35 of AMP Mode

#2: The same as #36 of AMP Mode

#3: The same as #40 of AMP Mode

Preset and Learnable area
Learnable area
Preset, Prepro and Learnable area
Prepro and Learnable area
Fixed TV command area
Special operation, unable to learn

3.14.3 Net-Tune, TV and VCR Code Table

Code table Falcon and Skyhawk

Key No. #	Function	Prepro	Symbol	Net-Tune			TV	VCR
				Preset Code				
				Custom	Data	Type		
				####				
side	LIGHT	Prepro number		Light operation				
1	POWER ON	Power On	I	D26D	04	1a		
2	STANDBY	Power Off	⏻	D26C	47	1a		
3	TV POWER	TV Power	⏻ / I	The same as #1 of TV Mode				
4	TV INPUT	TV TV/Video	INPUT	The same as #37 of TV Mode				
5	TV CH +	TV Ch +	+	The same as #33 of TV Mode				
6	TV CH -	TV Ch -	-	The same as #34 of TV Mode				
7	TV VOL +	TV Vol +	+	The same as #35 of TV Mode				
8	TV VOL -	TV Vol -	-	The same as #36 of TV Mode				
9	1 @,-/	1	1 @,-/	D202	D5	1a		
10	2 ABC	2	2 ABC	D202	D6	1a		
11	3 DEF	3	3 DEF	D202	D7	1a		
12	4 GHI	4	4 GHI	D202	D8	1a		
13	5 JKL	5	5 JKL	D202	D9	1a		
14	6 MNO	6	6 MNO	D202	DA	1a		
15	7 PQRS	7	7 PQRS	D202	DB	1a		
16	8 TUV	8	8 TUV	D202	DC	1a		
17	9 WXYZ	9	9 WXYZ	D202	DD	1a		
18	+10 --/---	+10	+10 --/---					
19	0	0	0	D202	DE	1a		
20	ENTER DIRECT TUNING	Enter	ENT D TUN					
21	CUSTOM		CUSTOM	Custom operation				
22								
23								
24	ZONE 3		ZONE 3	D202	5E	1c/1d	Zone 3 operation	
25	MACRO		MACRO	Macro operation				
26								
27								
28	ZONE 2		ZONE 2	D26D	CC	1c/1d	Zone 2 operation	
29	MODE		MODE	Mode operation				
30								
31								
32	INPUT		INPUT	Input operation				
33	CH + DISC +	Ch + Step up	CH + DISC +	D26D	00	1b		
34	CH - DISC -	Ch - Step down	CH - DISC -	D26D	01	1b		
35	VOL +	Vol +	VOL Λ	#1				#1
36	VOL -	Vol -	VOL V	#2				#2
37	DIMMER TV / VIDEO	TV / Video, TV / VCR	DIMMER TV / VIDEO					

RC1406901 (Falcon & Skyhawk) Universal RF Remote

Key No. #	Function	Prepro	Symbol	Net-Tune			TV	VCR
				Preset Code				
				Custom	Data	Type		
				####				
38	SLEEP	Sleep	SLEEP					
39	DISPLAY PREVIOUS	Display Previous Channel	DISPLAY PREVIOUS	D202	9E	1a		
40	MUTING	Mute	MUTING	#3				#3
41	TOP MENU ASPECT	Title Aspect, Wide	TOP MENU TV ASPECT					
42	AUDIO ADJUST MENU	(Disc) Menu	AUDIO ADJUST MENU					
43	RETURN	Exit	RETURN					
44	SETUP	Setup Menu, Guide	SETUP	D202	9F	1a		
45	CURSOR	Up	Λ	D202	C0	1b		
46	CURSOR	Down	V	D202	C1	1b		
47	CURSOR	Left	<	D202	C2	1b		
48	CURSOR	Right	>	D202	C3	1b		
49	ENTER	Enter Ok	ENTER	D202	C4	1a		
50	<<	(VISS Index) Previous	◀◀	D202	90	1a		
51	PLAY	Play	▶	D202	8D	1a		
52	>>	(VISS Index) Next	▶▶	D202	8F	1a		
53	<<	Fast Rewind	◀◀	D202	81	1b		
54	PAUSE REVERSE PLAY	⏮	◀◀	D202	91	1a		
55	STOP	⏹	■	D202	8E	1a		
56	>>	Fast Forward	▶▶	D202	80	1b		
57	REC LAST PLAY	⏮ Last Play	● Last Play					
58	<	Slow Rewind ◀◀ Backword	◀◀					
59	>	Slow Forward	▶▶					
60	RANDOM	Shuffle (One)	RANDOM	D202	93	1a		
61	SURROUND AUDIO	◀◀ Audio	SURR AUDIO					
62	THX ANGLE	▶▶ Angle	THX ANGLE					
63	ALL CH STEREO SUBTITLE	Language	ALL ST SUBTITLE					
64	STEREO CLEAR	(Memo) Clear	STEREO CLEAR					
65	PURE AUDIO REPEAT	Repeat	PURE A REPEAT	D202	92	1a		
66	DIRECT A-B	Repeat A-B	DIRECT A-B					
67	DSP - SEARCH	Scan	< DSP SEARCH					
68	DSP + MEMORY	Memery, Program	DSP > MEMORY					
69	TEST PLAYLIST		TEST PLAYLIST	D202	9B	1a		
70	CH SEL ALBUM		CH SEL ALBUM	D202	98	1a		
71	LEVEL - ARTIST		< LEVEL ARTIST	D202	99	1a		
72	LEVEL + GENRE		LEVEL > GENRE	D202	9A	1a		
74	EJECT OPEN / CLOSE CAPS	Eject	▲ CAPS	D202	D0	1a		

Key No. #	Function	Prepro	Symbol	Net-Tune			TV	VCR
				Preset Code				
				Custom	Data	Type		
				####				
73	AUDIO SELECTOR DELETE	▲	A SEL DEL	D202	D1	1a		
75	LATE NIGHT LANGUAGE		L NIGHT LANGUAGE	D202	9D	1a		
76	Re-EQ LOCATION		Re-EQ LOCATION	D202	9C	1a		
77	Scrolling Jog upward			Scrolling Jog Upward Operation				
78	Scrolling Jog downward			Scrolling Jog Downward Operation				
79	Pressing Jog			Pressing Jog Operation				

#1: The same as #35 of AMP Mode

#2: The same as #36 of AMP Mode

#3: The same as #40 of AMP Mode

Preset and Learnable area
Learnable area
Preset, Prepro and Learnable area
Prepro and Learnable area
Fixed TV command area
Special operation, unable to learn

3.14.4 CDR and Cable Code Table

Code table Falcon and Skyhawk

Key No. #	Function	Prepro	Symbol	CDR			Cable
				Preset Code			
				Custom	Data	Type	
				####			
side	LIGHT			Light operation			
1	POWER ON	Power On	I	D2AC	97	1a	
2	STANDBY	Power Off	⏻	D2AC	9C	1a	
3	TV POWER	TV Power	⏻/I	The same as #1 of TV Mode			
4	TV INPUT	TV TV/Video	INPUT	as #37 of TV Mode			
5	TV CH +	TV Ch +	+	as #33 of TV Mode			
6	TV CH -	TV Ch -	-	as #34 of TV Mode			
7	TV VOL +	TV Vol +	+	as #35 of TV Mode			
8	TV VOL -	TV Vol -	-	as #36 of TV Mode			
9	1 @.-/	1	1 @.-/	D2AC	55	1a	
10	2 ABC	2	2 ABC	D2AC	56	1a	
11	3 DEF	3	3 DEF	D2AC	57	1a	
12	4 GHI	4	4 GHI	D2AC	58	1a	
13	5 JKL	5	5 JKL	D2AC	59	1a	
14	6 MNO	6	6 MNO	D2AC	5A	1a	
15	7 PQRS	7	7 PQRS	D2AC	5B	1a	
16	8 TUV	8	8 TUV	D2AC	5C	1a	
17	9 WXYZ	9	9 WXYZ	D2AC	5D	1a	
18	+10 --/---	+10	+10 --/---	D2AC	5F	1a	
19	0	0	0	D2AC	5E	1a	
20	ENTER DIRECT TUNING	Enter	ENT D TUN				
21	CUSTOM		CUSTOM	Custom operation			
22							
23							
24	ZONE 3		ZONE 3	D202	5E	1c/1d	Zone 3 operation
25	MACRO		MACRO	Macro operation			
26							
27							
28	ZONE 2		ZONE 2	D26D	CC	1c/1d	Zone 2 operation
29	MODE		MODE	Mode operation			
30							
31							
32	INPUT		INPUT	Input operation			
33	CH + DISC +	Ch + Step up	CH + DISC +				
34	CH - DISC -	Ch - Step down	CH - DISC -				
35	VOL +	Vol +	VOL Λ	#1			#1
36	VOL -	Vol -	VOL V	#2			#2
37	DIMMER TV / VIDEO	TV / Video, TV / VCR	DIMMER TV / VIDEO				

Key No. #	Function	Prepro	Symbol	CDR			Cable
				Preset Code			
				Custom	Data	Type	
				####			
38	SLEEP	Sleep	SLEEP				
39	DISPLAY PREVIOUS	Display Previous Channel	DISPLAY PREVIOUS	D2AC	99	1a	
40	MUTING	Mute	MUTING	#3			#3
41	TOP MENU ASPECT	Title Aspect, Wide	TOP MENU TV ASPECT				
42	AUDIO ADJUST MENU	(Disc) Menu	AUDIO ADJUST MENU				
43	RETURN	Exit	RETURN				
44	SETUP	Setup Menu, Guide	SETUP				
45	CURSOR	Up	Λ				
46	CURSOR	Down	V				
47	CURSOR	Left	<				
48	CURSOR	Right	>				
49	ENTER	Enter Ok	ENTER				
50	<<	(VISS Index) Previous	⏮	D2AC	90	1a	
51	PLAY	Play	▶	D2AC	8D	1a	
52	>>	(VISS Index) Next	⏭	D2AC	8F	1a	
53	<<	Fast Rewind	⏮	D2AC	01	1b	
54	PAUSE REVERSE PLAY	⏮	⏮	D2AC	91	1a	
55	STOP	⏮	■	D2AC	8E	1a	
56	>>	Fast Forward	⏭	D2AC	00	1b	
57	REC LAST PLAY	⏮	●	D2AC	92	1a	
58	<	⏮ Slow Rewind ⏮ Backword	⏮				
59	>	Slow Forward	⏭				
60	RANDOM	Shuffle (One)	RANDOM	D2AC	9A	1a	
61	SURROUND AUDIO	◀ Audio	SURR AUDIO				
62	THX ANGLE	▶ Angle	THX ANGLE				
63	ALL CH STEREO SUBTITLE	Language	ALL ST SUBTITLE				
64	STEREO CLEAR	(Memo) Clear	STEREO CLEAR	D2AC	93	1a	
65	PURE AUDIO REPEAT	Repeat	PURE A REPEAT	D2AC	94	1a	
66	DIRECT A-B	Repeat A-B	DIRECT A-B				
67	DSP - SEARCH	Scan	< DSP SEARCH				
68	DSP + MEMORY	Memery, Program	DSP > MEMORY	D2AC	9B	1a	
69	TEST PLAYLIST		TEST PLAYLIST				
70	CH SEL ALBUM		CH SEL ALBUM				
71	LEVEL - ARTIST		< LEVEL ARTIST				
72	LEVEL + GENRE		LEVEL > GENRE				
74	EJECT OPEN / CLOSE CAPS	Eject	▲ CAPS	D2AC	98	1a	

Key No. #	Function	Prepro	Symbol	CDR			Cable
				Preset Code			
				Custom	Data	Type	
				####			
73	AUDIO SELECTOR DELETE	▲	A SEL DEL				
75	LATE NIGHT LANGUAGE		L NIGHT LANGUAGE				
76	Re-EQ LOCATION		Re-EQ LOCATION				
77	Scrolling Jog upward			Scrolling Jog Upward Operation			
78	Scrolling Jog downward			Scrolling Jog Downward Operation			
79	Pressing Jog			Pressing Jog Operation			

#1: The same as #35 of AMP Mode

#2: The same as #36 of AMP Mode

#3: The same as #40 of AMP Mode

Preset and Learnable area
Learnable area
Preset, Prepro and Learnable area
Prepro and Learnable area
Fixed TV command area
Special operation, unable to learn

3.14.5 MD and Satellite Code Table

Code table Falcon and Skyhawk

Head table: Prepro and Skyway

Key No. #	Function	Prepro	Symbol	MD			Satellite
				Preset Code			
				Custom	Data	Type	
				####			
side	LIGHT			Light operation			
1	POWER ON	Power On	I	D2AC	44	1a	
2	STANDBY	Power Off	⏻	D2AC	46	1a	
3	TV POWER	TV Power	⏻/I	The same as #1 of TV Mode			
4	TV INPUT	TV TV/Video	INPUT	The same as #37 of TV Mode			
5	TV CH +	TV Ch +	+	The same as #33 of TV Mode			
6	TV CH -	TV Ch -	-	The same as #34 of TV Mode			
7	TV VOL +	TV Vol +	+	The same as #35 of TV Mode			
8	TV VOL -	TV Vol -	-	The same as #36 of TV Mode			
9	1 @,-/	1	1 @,-/	D2AC	47	1a	
10	2 ABC	2	2 ABC	D2AC	48	1a	
11	3 DEF	3	3 DEF	D2AC	49	1a	
12	4 GHI	4	4 GHI	D2AC	4A	1a	
13	5 JKL	5	5 JKL	D2AC	4B	1a	
14	6 MNO	6	6 MNO	D2AC	4C	1a	
15	7 PQRS	7	7 PQRS	D2AC	4D	1a	
16	8 TUV	8	8 TUV	D2AC	4E	1a	
17	9 WXYZ	9	9 WXYZ	D2AC	4F	1a	
18	+10 -- / ---	+10	+10 -- / ---	D2AC	51	1a	
19	0	0	0	D2AC	50	1a	
20	ENTER DIRECT TUNING	Enter	ENT D TUN	D26C	17	1a	
21	CUSTOM		CUSTOM	Custom operation			
22							
23							
24	ZONE 3		ZONE 3	D202	5E	1c/1d	Zone 3 operation
25	MACRO		MACRO	Macro operation			
26							
27							
28	ZONE 2		ZONE 2	D26D	CC	1c/1d	Zone 2 operation
29	MODE		MODE	Mode operation			
30							
31							
32	INPUT		INPUT	Input operation			
33	CH + DISC +	Ch + Step up	CH + DISC +				
34	CH - DISC -	Ch - Step down	CH - DISC -				
35	VOL +	Vol +	VOL Λ	#1			#1
36	VOL -	Vol -	VOL V	#2			#2
37	DIMMER TV / VIDEO	TV / Video, TV / VCR	DIMMER TV / VIDEO				

Key No. #	Function	Prepro	Symbol	MD			Satellite
				Preset Code			
				Custom	Data	Type	
				####			
38	SLEEP	Sleep	SLEEP				
39	DISPLAY PREVIOUS	Display Previous Channel	DISPLAY PREVIOUS	D26C	11	1a	
40	MUTING	Mute	MUTING	#3			#3
41	TOP MENU ASPECT	Title Aspect, Wide	TOP MENU TV ASPECT				
42	AUDIO ADJUST MENU	(Disc) Menu	AUDIO ADJUST MENU				
43	RETURN	Exit	RETURN				
44	SETUP	Setup Menu, Guide	SETUP				
45	CURSOR	Up	^				
46	CURSOR	Down	v				
47	CURSOR	Left	<				
48	CURSOR	Right	>				
49	ENTER	Enter Ok	ENTER				
50	<<	(VISS Index) Previous	⏮	D26C	0D	1a	
51	PLAY	Play	▶	D26C	0A	1a	
52	>>	(VISS Index) Next	⏭	D26C	0C	1a	
53	<<	Fast Rewind	⏮	D26C	01	1b	
54	PAUSE REVERSE PLAY	⏮	⏮	D26C	0E	1a	
55	STOP	⏮	■	D26C	0B	1a	
56	>>	Fast Forward	⏭	D26C	00	1b	
57	REC LAST PLAY	⏮ Last Play	● Last Play	D26C	0F	1a	
58	<	⏮ Slow Rewind ⏮ Backword	⏮				
59	>	Slow Forward	⏭				
60	RANDOM	Shuffle (One)	RANDOM	D26C	15	1a	
61	SURROUND AUDIO	◀ Audio	SURR AUDIO				
62	THX ANGLE	▶ Angle	THX ANGLE				
63	ALL CH STEREO SUBTITLE	Language	ALL ST SUBTITLE				
64	STEREO CLEAR	(Memo) Clear	STEREO CLEAR	D26C	14	1a	
65	PURE AUDIO REPEAT	Repeat	PURE A REPEAT	D26C	16	1a	
66	DIRECT A-B	Repeat A-B	DIRECT A-B				
67	DSP - SEARCH	Scan	< DSP SEARCH				
68	DSP + MEMORY	Memery, Program	DSP > MEMORY	D26C	10	1a	
69	TEST PLAYLIST		TEST PLAYLIST				
70	CH SEL ALBUM		CH SEL ALBUM				
71	LEVEL - ARTIST		< LEVEL ARTIST				
72	LEVEL + GENRE		LEVEL > GENRE				
74	EJECT OPEN / CLOSE CAPS	Eject	⏮ CAPS	D2AC	45	1a	

Key No. #	Function	Prepro	Symbol	MD			Satellite
				Preset Code			
				Custom	Data	Type	
				####			
73	AUDIO SELECTOR DELETE	▲	A SEL DEL				
75	LATE NIGHT LANGUAGE		L NIGHT LANGUAGE				
76	Re-EQ LOCATION		Re-EQ LOCATION				
77	Scrolling Jog upward			Scrolling Jog Upward Operation			
78	Scrolling Jog downward			Scrolling Jog Downward Operation			
79	Pressing Jog			Pressing Jog Operation			

#1: The same as #35 of AMP Mode

#2: The same as #36 of AMP Mode

#3: The same as #40 of AMP Mode

Preset and Learnable area
Learnable area
Preset, Prepro and Learnable area
Prepro and Learnable area
Fixed TV command area
Special operation, unable to learn

3.15 Description of error handling

3.15.1 Watchdog timer

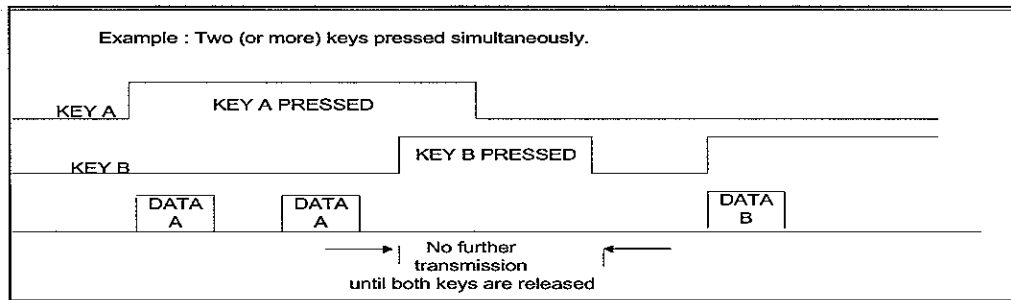
The microcontroller has a built in watchdog timer, which will reset the controller if the program operation should get corrupted.

3.15.2 Stuck key function

A stuck key function prevents that the batteries are drained when a button remains pressed for over 60 seconds (e.g. by placing something heavy on top of the remote). The remote will stop sending automatically after 60 seconds and will resume operation when all keys are released.

3.15.3 Handling of multiple keys

If more than one key is pressed simultaneously, IR transmission will stop until all keys are released. The transmitting LED will turn off.



4. External Interface Requirements

4.1 Hardware interfaces

The software has to interact with:

- Input devices
- Output devices
- Storage devices

4.2 Input devices

4.2.1 Keys

These buttons are located on the main body of the remote, house in the top part assembly. Press these buttons activates and make contact with the carbon pad on PWB directly.

4.2.2 Side key

This key mainly to ON/OFF the backlight of the remote.

4.2.3 Jog Dial

This input device is a combination of a rotary switch and a tack switch. The rotary switch enable the user to scroll through and select the item in the menu that is display in the LCD panel. The tack switch enable the user to activate the transmission of the Mode or Selector input code that user has select.

4.3 Output Devices

4.3.1 RF Transmission

The module sends signal via a 433.92MHz RF link usable in USA, Canada and Australia, New Zealand and EU market.

4.3.2 Infra Red Emitting Diodes

The IR LED's are used to transmit the selected codes and protocols via IR.

4.3.3 Colour LEDs

The red and green colour indicating LED are located at the top of the remote. Under the MACRO, MODE, INPUT and ZONE2 key, each have a GREEN colour LED .

4.4 Storage Devices

4.4.1 EEPROM

EEPROM is used to store successfully learned IR codes; device mode status and LCD display status so that the remote is able to operate from the previous selected mode even after battery replacement.

5. Universal ID Load List

Notes: User need to key in a "0" follow by the 3 digits code indicate in below table to select the Device ID