STM32F4 Discovery Firmware update, MMos HID USB firmware flashing – Beano, April'15

<u>Step 1</u>: Download and install the ST-Link software, STSW-LINK004 <u>http://www.st.com/web/catalog/tools/FM147/SC1887/PF258168?s_searchtype=partnumber</u>

<u>Step 2:</u> Download and save the MMos latest HID USB Firmware, to a known location on your PC http://forum.virtualracing.org/showthread.php/92420-DIY-USB-Force-Feedback-Controller

<u>Step 3:</u>

Connect both USB mini (Disco flash) and micro-USB (HID USB) ports on the discovery to your PC.



<u>Step 4:</u>

Open ST-Link; follow the following steps exactly as below. Select ST-Link and Firmware update, note the 'Disconnected' in the bottom left of the picture.



<u>Step 5:</u> Note the empty firmware versions, then click 'Device Connect'

🖷 STM32 ST-LINK Utility			
<u>File</u> <u>E</u> dit <u>V</u> iew <u>I</u> arget ST-LINK External Loader <u>H</u> elp			
🖴 🖥 🔱 🕼 🖉 隧 🙍 🔜			
Memory display		Device Inform	ation
Address: 0x08000000 - Size: 0x1988C Data Width: 32 bits -		Device	
		Device ID Revision ID	
Device Memory Binary File		Flash size	
Device Memory			LiveUpdate
	ST-Link Upgrade		
Disconnected	evice ID :	State : No Memory Loaded	

<u>Step 6:</u> After selecting 'Device Connect' both the original factory firmware, as well as the new version, will be displayed. Select 'Yes' and the Discovery will update its internal flash.

Note my 'Yes' button is greyed out as I have done this earlier.

File Edit View Target ST-LINK External Loader Help		
🖴 🖥 🖕 🤹 🖉 🌾 🔊 📼		
Memory display		Device Information
Address: 0x08000000 v Size: 0x1388C Data Width: 32 bits v		Device
		Device ID
Device Mensey and		Revision ID
Device Memory Binary File		Flash size
Device Memory		LiveUpdate
	ST-Link Upgrade	
	Device Connect	
	Firmware Version: V2.321.S0 JTAG Debugger	
	Upgrade the firmware to V2.J21.S0 (Yes >>>>	
	<u></u>	
1		
Disconnected	Device ID :	Core State : No Memory Loaded

<u>Step 7:</u> Now onto the next part, where we will turn the device into a DD FFB steering wheel controller, by flashing the MMos firmware. Select the 'Target' dropdown from the main menu, and then 'Connect'.

🖏 STM32 ST-LINK Util	7.			
File Edit View Ta	rget ST-LINK External Loader Help			
🖴 🔲 💾 🚺	Connect			
	Disconnect CTRL+D			Davice Information
Memory display	Free Chine CTDL F			Device
Address: 0x080	Erase Chip CTRE+E	32 bits 👻	0	Device ID
Design Manager	Erase Banki		F	Levision ID
Device Memory B	Erase Bank2		F	lash size
Device memory	Erase Sectors			LiveUpdate
	Program			
	Program & Verify CTRL+P			
	Blank Check			
	Target memory compare with file			
	Option Bytes CTRL+B			
	MCU Core			
	Automatic Mode			
	Settings CTRL+S			
17:35:24 : ST-LINK SN :	48FF 74065075495535130187			
17:35:24 : ST-LINK Firm	ware version : V2J21S0			
17:35:24 : Connection m	a SVD. 10de : Normal.			
17:35:24 : Debug in Low 17:35:24 : Device ID:0x	Power mode enabled. 413			
17:35:24 : Device flash 5	Size : 1MBytes			
17:35:24 : Device ramily 17:35:32 : Disconnected	from device.			
I				
Disconnected		Device ID :	Core State : No Men	nory Loaded

<u>Step 8:</u> Device will now be connected, and you should see the factory memory contents of the Discovery controller.

🖏 STM32 ST-LIN	IK Utility								
<u>File Edit Viev</u>	v <u>T</u> arget ST-	LINK External	Loader <u>H</u> elp						
🔒 🖥 🖐	i 🗣 🧳 🖞	🎽 🤌 🏹							
Memory display								Device Information	
Address: 0x0	8000000 - Si	ze: 0x1388	C Data Wi	dth: 32 bits •			Device Device	STM32F40xx/F41xx	
							Revision ID	Rev Z	
Device Memory @	a 0x08000000	Binary File					Flash size	1MBytes	
Target	ddaeau range: [0x	08000000 0x080	013B8C]	-					LiveUpdate
Address	0	4	8	С	ASCII				^
0x08000000	20000C78	0800637D	080059A9	080059AB	x}c©Y«Y				
0x08000010	080059AD	080059AF	080059B1	00000000	- Y ⁻ Y ± Y				
0x08000020	00000000	00000000	00000000	080059B3	³ Y				
0x08000030	080059B5	00000000	080059B7	08005989	$\mu Y \dots \dots Y \dots {}^1 Y \dots$				
0x08000040	080063D5	080063D9	080063DD	080063E1	ÕcÙcÝcác				
0x08000050	080063E5	080063E9	08005CAF	080063F1	åcéc ⁻ \ñc				
0x08000060	080063F5	080063F9	080063FD	08002D47	õ c ù c ý c G				
0x08000070	08006405	08006409	0800640D	08006411	. d d d				
0x08000080	08006415	08006419	0800641D	08006421	.ddld				
0x08000090	08006425	08006429	0800642D	08006431	% d) d d 1 d				
0x080000A0	08006435	08006439	0800643D	08006441	5 d 9 d = d A d				
0x080000B0	08006445	08006449	0800644D	08006451	E d I d M d Q d				
0x080000C0	08006455	08006459	0800645D	08006461	U d Y d] d a d				
0x080000D0	08006465	08006469	0800646D	08006471	e d i d m d q d				
0x080000E0	08006475	08006479	08005CBF	08006481	u d y d ¿ \ d				
0-02000050	00006105	00006400	00006490	00002025	4 9 4 4 2				*
17:35:27 - Device 17:35:32 : Discon 17:36:04 : ST-LIN 17:36:04 : ST-LIN 17:36:04 : Come 17:36:04 : Come 17:36:04 : Come 17:36:04 : Device 17:36:04 : Device	ronny .91932 m nected from devic IK SN : 48FF74065 IK Firmware versio cted via SWD. ction mode : Norr in Low Power mod ID:0x413 flash Size : 1MBy : family :STM32F4	vaa/i 1144 50.754955351301 vn : V2J2150 tal. de oo bled. tes 0xx/F41xx	187						E
Debug in Low Pow	er mode enabled.				Device ID:0x413	Core State : Live	Update Disable	ed	

<u>Step 9:</u> Next we will open the newly downloaded MMos firmware file, the link in Step 2 above. From the dropdown menu, select 'File' and then 'Open file'

M32 ST-LINK	Utility							
File Edit View	Target ST-L	INK External L	.oader Help					
Open file	CTRL+0	Image:						
Save file as	CTRL+S						Davice Information	
Close File						Device	STM32F40xx/F41xx	
c	<i>c</i> 1	0x13880	Data Wid	th: 32 bits 🔻		Device ID	0x413	
Compare two	files					Revision ID	Rev Z	
Exit		File	20001			Flash size	1MBytes	
Address	0	4	0	0	ASCII			LiveUpdate
Address	20000.078	*	00005040	0000504.0	ASCI			
0x08000000	20000076	00000570	00005001	000039Ab	X ; C © F « T			
0x08000010	080039AD	000009AP	00000000	0000000	- T T ± T			
0x08000020	0000000	0000000	0000000	08005983	v v tv			
0x08000030	08005985	0000000	08005987	08005989	μΥΥΥΥ 8 δ ά ά			
0x08000040	080063D5	080063D9	080063DD	080063E1	0 c U c Y c a c			
0x08000050	080063E5	080063E9	08005CAF	080063F1	ácéc \ñc			
0x08000060	080063F5	080063F9	080063FD	08002D47	őcúcýcG			
0x08000070	08006405	08006409	0800640D	08006411	.ddd			
0x08000080	08006415	08006419	0800641D	08006421	.ddd!d			
0x08000090	08006425	08006429	0800642D	08006431	%d)dd1d			
0x080000A0	08006435	08006439	0800643D	08006441	5 d 9 d = d A d			
0x080000B0	08006445	08006449	0800644D	08006451	EdIdMdQd			
0x080000C0	08006455	08006459	0800645D	08006461	U d Y d] d a d			
0x080000D0	08006465	08006469	0800646D	08006471	edidmdqd			
0x080000E0	08006475	08006479	08005CBF	08006481	u d y d ¿ \ d			
0-02000050	00006405	00006400	00006490	00002025				
17:35:27 Device to 17:35:32 : Discome 17:36:04 : ST-LINK 17:36:04 : ST-LINK 17:36:04 : ST-LINK 17:36:04 : Connect 17:36:04 : Device fit 17:36:04 : Device fit 17:36:04 : Device fit	stiny istricte from device sched from device SN : 48FF740650 Firmware version ed via SWD. on mode : Norma Low Power mode :0x413 ash Size : 1MByte amily :STM32F40;		7					E
Debug in Low Power	mode enabled.	<u> </u>	<u> </u>		Device ID:0x413	Core State : Live Update Disable	ed	

<u>Step 10:</u> Navigate to where you have earlier saved the MMos firmware file, as below. Select it and then 'Open' from the dialog button.

🖷 Open		×
MMos STM	/32F4 USB Inte MMosFFB_FW_0.99	✓ 4 Search MMosFFB_FW_0.99
Organize 🔻 New folde	r	i= - 🔟 🔞
★ Favorites ■ Desktop	Documents library MMosFFB_FW_0.99	Arrange by: Folder 🔻
Downloads	Name	^
Recent Places	FFB2014-0.99.hex	
Cibraries	Type: HEX File Size: 99.8 KB Date modified: 10/0:	1/2015 10:19 PM
J Music		
Pictures		
Videos		
🖳 Computer		
SDisk (C:) 🔻	<	▶
File <u>n</u> a	me: FFB2014-0.99.hex	✓ Supported Files (*.bin *.hex *.sri ▼ Open Cancel

<u>Step 11:</u> You should see something similar to the display below, note the areas marked in red ellipses.

📹 STM32 ST-LINK (Jtility							
<u>File Edit View</u>	Target ST-LI	VK External L	oader <u>H</u> elp					
😐 🔲 💾 🐇	T: 🤌 🚿	🙆 🔜						
	* * *						Davice Information	
Memory display						Device	STM32E40xx/E41xx	
Address: 0x0800	00000 👻 Size:	0x1388C	Data Widt	th: 32 bits 🔻		Device ID	0x413	
		_				Revision ID	Rev Z	
Device Memory @ 0:	x08000000	e : FFB2014-0.9	9.hex			Flash size	1MBytes	
[FFB2014-0.99.nex],	Address range:	UX08000000 0X	0801388CJ		4007			
Address	0	4	8	00000700	ASCI			î
0x08000000	20010000	0800115D	08000705	08000709]			
0x08000010	0800070D	08000711	08000715	00000000				
0x08000020	00000000	00000000	00000000	08000719				
0x08000030	0800071D	00000000	08000721	08000725				
0x08000040	080011C5	080011C7	080011C9	080011CB	AçÉ			
0x08000050	080011CD	080011CF	080011D1	080011D3	ÍĨŇÓ			
0x08000060	080011D5	080011D7	080011D9	080011DB	Õ×ÛÛ			
0x08000070	080011DD	080011DF	08000A49	080011E3	ÝBIã			
0x08000080	080011E5	080011E7	080011E9	080011EB	åç			
0x08000090	080011ED	080011EF	080011F1	080011F3	íīňó			
0x080000A0	080011F5	080011F7	080011F9	080011FB	õ+ùû			
0x080000B0	080007B9	080011FF	08001201	08001203	1ÿ			
0x080000C0	08001205	08001207	08001209	08000951	Q			
0x080000D0	08000999	0800120F	08001211	08001213	TM			
0x080000E0	08000A1D	08001217	08000729	0800121B)			
0-02000050	00001210	0900121E	09001221	00001222	1 #			Ψ.
•								P.
17:36:04 : ST-LINK S	N: 48FF 7406 507	7549553513018	7					^
17:36:04 : ST-LINK P 17:36:04 : Connecte	irmware version : d via SWD.	: V2J2150						
17:36:04 : Connectio	n mode : Normal.	enabled						
17:36:04 : Device ID	:0x413	endored.						
17:36:04 : Device fla 17:36:04 : Device fa	sh Size : 1MBytes nily :STM32F40x	x/F41xx	-					=
17:40:06 : [FFB2014	-0.99.hex] opene	ed successfully.	>					
Data a la La Data a	and a smalled				Device TO Out 12	En one we have all o	feeted.	
pebug in Low Power r	noue enabled.	- N	- Y		beate 10:0x412	pore state : No Memory Grid Se	iected	

<u>Step 12:</u> From the dropdown menu, select 'Target' followed by 'Erase chip'.

STM32 ST-LINK	Utili y												
File Edit View	Target ST-L	.INK External	Loader Help										
🖴 🗖 🖕	Connec	t iect C1	TRL+D										
Memory display	_	-					Device	Device Information					
Address: 0x080	Erase Ch	пр СТ	RL+E				Device ID	51M52PH0XX/PH1XX 0x413					
	Erase Ba	nkl					Revision ID	Rev Z					
Device Memory @ 0	Erase Ba	ink2					Flash size	1MBytes					
Target memory, Add	Erase Se	ctors							LiveUpdate				
Address	D				ш				<u>^</u>				
0x08000000	Program	1 0.11 is co			}c©Y«Y								
0x08000010	Program & Verty CTRL+P												
0x08000020	Blank C	heck			² Y								
0x08000030	Compar	e device mem	ory with [FFB201	4-0.99.hex]	Y ¹ Y								
0x08000040	Ontion	Puter CT	DI . D		ÙcÝcác								
0x08000050	option	bytes Ch	NL+D		.éc ⁻ \ñc								
0x08000060	MCU Co	ore			.ùcýcG								
0x08000070	Automa	tic Mode											
0x08000080					dd!d								
0x08000090	Settings	CIR	L+S	00000431	(and (a)) d. (- d. (1 d.))								
0x08000040	08006435	08006439	0800643D	08006441	5d 9d -d Ad								
0x08000080	08006445	08006449	0800644D	08006451	Ed Id Md Od								
0x080000C0	08006455	08006459	0800645D	08006461	Ud Vd 1d ad								
0x08000000	08006465	08006469	0800646D	08006471	ed id md ad								
0x080000E0	08006475	08006479	08005CBE	08006481	ud vd ·\ d								
0-09000050	00006495	00006490	00005001	00000401	d 9 d d 2								
< [III					F				
17:40:06 : [FFB2014 17:42:22 : ST-LINK S 17:42:22 : ST-LINK F 17:42:22 : Connecte 17:42:22 : Connecte	HO.99.hex] ope SN : 48FF74065 Firmware version of via SWD. on mode : Norm	ned successfully 0754955351301 n : V2J21S0 al.	/. 187						^				
17:42:22 : Debug in 17:42:22 : Device ID	Low Power mod 0x413	e enabled.											
17:42:22 : Device fla 17:42:22 : Device fa	nily :STM32F40	es xx/F41xx							-				
Debug in Low Power	mode enabled.				Device ID:0x413		Core State : Live Update Disable	d					
	T I						, 						

<u>Step 13:</u> After completion, memory contents should display 'FFFFFFF' in all memory locations, and the text should indicate as per the blue arrow in the bottom left hand corner.

🖏 STM32 ST-LIN	K Utility								
<u>File Edit View</u>	v <u>T</u> arget ST-	LINK External	Loader <u>H</u> elp						
🖴 🖥 🖖	i 🗣 🧳 🖞	🏂 🥥 🔜							
Memory display								Device Information	
Address: 0x0	8000000 - Si	ze: 0x1388	C Data Wi	dth: 32 bits	-		Device Device	STM32F40xx/F41xx	
							Revision ID	Rev 7	
Device Memory @	9 0x08000000 :	File : FFB2014 0	20 Here				Flash size	1MBytes	
Target memory, A	ddress range; IO	0000000 0x080	013B8C]						LiveUpdate
Address	0	4	8	С	ASCI				^
0x08000000	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0x08000010	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0x08090020	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŸŸ</u> ŸŸ				
0x0x000030	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0 08000040	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŸŸŸ</u> Ÿ				
08000050	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
x08000060	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
08000070	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	<u> </u>				
0.08000080	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0x08000090	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	<u> </u>				
0x080100A0	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	999999999999999				
0x08000020	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0x080000C0	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	<u> </u>				
0x080000D0	NEEFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŸŸŸŸ</u> Ÿ				
0x080000E0	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0-09000050	CCCCCCCC	CCCCCCCC	-	CECCCCCC	0000000000000				*
17.10.00 . 01.020	THO DOMENTICAL OF	neu successiun;	0						
17:42:22 : ST-LIN 17:42:22 : ST-LIN	K SN : 48FF74065 K Firmware versio	0754955351301 n : V2121S0	187						^
17:42:22 : Conner	cted via SWD.								
17:42:22 : Conner 17:42:22 : Debug	in Low Power mo	de enabled.							
17:42:22 : Device	ID:0x413 flash Size : 1MBy	tes							
17:42:22 : Device	family :STM32F4	Dyr/F41xx							E
17:44:01 : Hash n	nemory erased.								*
Debug in Low Powe	er mode enabled.				Device ID:0x413	Core	State : Live Update Disable	d	
	Y								

STM22 CT LINK

<u>Step 14:</u> The next step would be to program the MMos Firmware, as well as verification of the event. Select 'Target' from the dropdown menu, followed by 'Program & Verify'

STIVISZ ST-LINK										
File Edit View	Target ST-LI	NK External I	Loader Help							
🔒 🔲 🛯 🖕 -	Connect									
Memory display	Disconne	ect CT	RL+D						Device Information	1
Address 0.000	Erase Ch	ip CTR	RL+E				[Device	STM32F40xx/F41xx	
Address: 0x080	Erase Bar	nk1						Device ID	0x413	
Device Memory @ (Erase Bar	1k2						Revision ID	Rev Z	
Target memory, Add	Erase Sec	tors						T Idal Talec	2-bytes	LiveUpdate
Address					ш					*
0x08000000	Program					ÿ				
0x08000010	Program	& Verify CT	RL+P		******	ÿ				
0x08000020	Blank Ch	eck			**********	ÿ				
0x08000030	Compare	e device memo	ry with [FFB201	4-0.99.hex]	**********	ÿ				
0x08000040	Ontion B	vtes CTR	I + B		****	ÿ				
0x08000050		,			, , , , , , , , , , , , , , , , , , ,	ÿ				
0x08000060	MCU Co	re			222222222222222222222222222222222222222	ÿ				
0x08000070	Automat	ic Mode			*****	ÿ				
0x08000080	Settings.		+S		*****	ÿ				
0x08000090					,,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ÿ				
0x080000A0	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŸŸŸ</u>	ÿ				
0x080000B0	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	<u> </u>	ÿ				
0x080000C0	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	<u>ŷŷŷŷŷŷŷŷŷŷŷŷŷŷŷ</u>	ÿ				
0x080000D0	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŶŶŶŶŶ</u>	ÿ				
0x080000E0	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	<u> </u>	ÿ				
1.000000E0	CCCCCCCC	CCCCCCCC	CCCCCCCC	CCCCCCC						
17.10.00.0102011	o.ssilexj oper	eu successiuny.	_							
17:42:22 : ST-LINK F	irmware version	: V2J21S0	57							
17:42:22 : Connecte 17:42:22 : Connecte	d via SWD. on mode : Norma	I.								
17:42:22 : Debug in	Low Power mode	enabled.								
17:42:22 : Device ID 17:42:22 : Device fla	sh Size : 1MByte	s								-
17:42:22 : Device fa 17:44:01 : Flash mer	mily :STM32F40> norv erased.	cx/F41xx								=
							 			*
Debug in Low Power	mode enabled.	V			Device ID:0x413		 Core State : Live U	pdate Disable	d	

<u>Step 15:</u> A dialogue box should appear, with the name of the correct MMos hex file in the top bar, this case 'FFB2014-0.99.hex'. Select 'Start' and wait for the progress bar to finish.

🖏 STM32 ST-LI	NK Utility						100		
<u>File Edit Vie</u>	ew <u>T</u> arget ST-L	.INK Externa	l Loader <u>H</u> elp						
🔒 🖥 🕴	b 🗣 🖉 🖗	š 🤌 🔜	2						
Memory display								Device Information	
Address: 0x	08000000 - Siz	re: 0x1388	BC Data Wi	dth: 32 bits 🔹	-		Device Device ID	STM32F40xx/F41xx	
							Revision ID	Rev Z	
Device Memory	@ 0x08000000 :	File : FFB2014	o co han	-			Flash size	1MBytes	
Target memory,	Address range; [0.4	5000000 0x08	013B8C]						LiveUpdate
Address	0	4	8	С	ASCI				^
0x08000000	FFFFFFF	FFFFFFF	FFFFFFF	FFFFFFF	<u> </u>				
0x0800001	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>	Download [FFB2014-0.99.hex]	X		
0x08000020	FFFFFFF	FFFFFFFF	FFFFFFF	FFFFFFF	<u> </u>				
0x0x000030	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>	Start address : UXU8000000			
0,08000040	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŸŸŸŸŸŸ</u>	File path : C:\Users\vervanreph\My Private Documents\AC SE	RVO Browse		
08000050	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>	Verification			
x08000060	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŸŸŸŸŸŸ</u> Ÿ	Verity while programming Verity after program	ming		
x08000070	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>	Click "Program" to start programming.			
0.08000080	FFFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u>ŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶŶ</u>				
0x03000090	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u>ŸŸŸŸŸŸŸŸŸŸŸŸŸŸ</u> Ÿ	Reset after programming			
0x080000A0	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFFF	9999999999999999999	Start Cancel			
0x08000020	FFFFFFF	FFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0x080000C0	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	9999999999999999999				
0x080000D0	NEEFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u>ŸŸŸŸŢŸŸŸŸŸŸŸŸŸŸ</u> Ÿ				
0x080000E0	FFFFFFF	FFFFFFFF	FFFFFFFF	FFFFFFF	<u> </u>				
0-09000050	CCCCCCC	CCCCCCCC	-	CECCCCCC	00000000000000000				
17.00.00.010	2017-0.25.0exj ope	neu succession	Y -						
17:42:22 : ST-LI 17:42:22 : ST-LI	NK SN: 48FF74065 NK Firmware version	075495535130: n : V2121S0	187						^
17:42:22 : Conn	ected via SWD.								
17:42:22 : Conn 17:42:22 : Debu	ig in Low Power mod	ai. le enabled.							
17:42:22 : Devic 17:42:22 : Devic	te ID:0x413 te flash Size : 1MBvt	hes.							
17:42:22 : Devic	e family :STM32F40	lxx/F41xx							=
17:44:01 : Flash	memory erased.								*
Debug in Low Po	wer mode enabled.				Device ID:0x413	Core SI	ate : Live Update Disab	led	
	The second se								

Step 16:

After completion of the flash process, I always make sure the Discovery Memory contents are the same as the file flashed from. Select 'Target' from the dropdown menu, followed by 'Compare device memory with [MMos hex file]'

STM32 ST-LINK	Jtiliy								
File Edit View	Target ST-L	JNK External	Loader Help						
	Connect Disconn	t iect C1	TRL+D					Davice Information	1
Mentory display	Error Ch		DI . C				Device	STM32F40xx/F41xx	
Address: 0x080	Erase Cr	np Ci	KL+E				Device ID	0x413	
	Erase Ba	inkl					Revision ID	Rev Z	
Device Memory @ 0	Erase Ba	ink2					Flash size	1MBytes	
Target memory, Add	Erase Se	ctors							LiveUpdate
Address	Program	n							î
0x08000000	Program	n & Verify Cl	TRL+P]			
0x08000010									
0x08000020	Blank Cl	heck		-					
0x08000030	Compar	e device mem	ory with [FFB201	4-0.99.hex]		!%			
0x08000040	Option i	Bytes CTR	RL+B			.ÇÉE			
0x08000050		·				ĪŇÓ			
0x08000060	MCU Co	ore				.×ÛÛ			
0x08000070	Automa	tic Mode				.BI			
0x08000080						.cé			
0x08000090	Settings	UIK	L+5	00001112		νñó			
0x080000A0	080011E5	080011E7	080011F9	080011EB	õ.				
0x08000080	08000789	080011EE	08001201	08001203	1	ÿ			
0x080000.00	08001205	08001207	08001200	08000951		0			
0-080000000	09000000	09001207	09001211	09001212	TM				
0.08000000	08000410	0000120F	08000720	00001215		\			
0x060000E0	00000A1D	00001217	08000729	00001218		······)·····			
<		invitit // c	nonin //	III					F.
17:42:22 : 01 5 PUNCT	d via SWD.	1. 1232130							~
17:42:22 : Connectio	on mode : Norm	al.							
17:42:22 : Debug in 17:42:22 : Device ID	:0x413	e enabled.							
17:42:22 : Device fla	sh Size : 1MByt	es ex E41ex							
17:44:01 : Flash mer	nory erased.	XX/1 +1XX							
17:46:35 : Flash men 17:46:35 : Verificatio	nory programme mOK	ed in 2s and 200	lms.						=
J									-
Debug in Low Power	mode enabled.					Device ID:0x413	re State : Live Update Disat	led	

<u>Step 17:</u> The result of Step 15 should be as per below, the most important part is the 'No difference found' – if you are at this point, you are almost done.

STM32 ST-LINE	(Utility											
<u>File Edit View</u>	Target ST-L	INK External	Loader <u>H</u> elp									
🖴 🖥 🗳	Ç 🧳 🖗	š 👰 🔜										
Memory display										Davias	Device Informat	on
Address: 0x08	000000 👻 Siz	e: 0x1388	C Data Wi	dth: 32 bits	-					Device II	0 0v413	
										Revision	ID Rev Z	
Device Memory @	0x08000000 : F	File : FFB2014-0	.99.he. Compa	rison: Device Me	mory Vs [FFB2014-0.99.hex]					Flasman	1MBytes	
Target memory, Ad	dress range: [0x0	08000000 0x080)13B8C]				[FFB2014-0.9	9.hex], Address	range: [0x080000	000 0x0801388C]	2	
Address	0	4	8	С	ASCII		0	-	0		ASCII	^
0x08000000	20010000	0800115D	08000705	08000709	1		20010000	0800115D	08000705	08000709	1	
0x08000010	0800070D	08000711	08000715	00000000			0800070D	08000711	08000715	00000000		
0x08000020	00000000	00000000	00000000	08000719			00000000	00000000	00000000	08000719		
0x08000030	0800071D	00000000	08000721	08000725	!%		0800071D	00000000	08000721	08000725	!%	
0x08000040	080011C5	080011C7	080011C9	080011CB	ÅÇÉE		080011C5	080011C7	080011C9	080011CB	ÅÇÉĔ	
0x08000050	080011CD	080011CF	080011D1	080011D3	ÍĪÑÓ		080011CD	080011CF	080011D1	080011D3	ÍĪÑÓ	
0x08000060	080011D5	080011D7	080011D9	080011DB	Õ×ÙÛ		080011D5	080011D7	080011D9	080011DB	Õ×ÙÛ	
0x08000070	080011DD	080011DF	08000A49	080011E3	ÝBIã			080011 DF	08000A49	080011E3	ÝBIā	
0x08000080	080011E5	080011E7	080011E9	080011EB	åçé	Information			011E9	080011EB	åçéē	
0x08000090	080011ED	080011EF	080011F1	080011F3	íīñó				011F1	080011F3	íīñó	
0x080000A0	080011F5	080011F7	080011F9	080011FB	ő+ùû		No difference four	id.	11F9	080011FB	ő÷ùû	
0x080000B0	08000789	080011FF	08001201	08001203	1ÿ		This file is already	file is already downloaded.		08001203	1ÿ	
0x080000C0	08001205	08001207	08001209	08000951	Q				1209	08000951	Q	
0x080000D0	08000999	0800120F	08001211	08001213	τ.				01211	08001213	тм	
0x080000E0	08000A1D	08001217	08000729	0800121B)			UK	00729	0800121B)	
0-09000050	0900121D	00001210	09001221	09001222	1 #			Monthly Arts	1100011 221	00001000	1 +	*
												4
17:44:01 : Flash m 17:46:35 : Flash m 17:46:35 : Verifica 17:50:24 : No diffe This file	emory erased. emory programme tionOK rrence found. e is already downli	ed in 2s and 200 oaded.	ms.									^
17:51:52 : No diffe	rence found.	andad										
17:52:42 : No diffe This file	rence found. is already downli	oaded.										E
Debug in Low Power mode enabled. Device ID:0x413							Core State : No Memory Grid Selected					

<u>Step 18:</u> Next, select the 'Disconnect' icon and the connection to the discovery should terminate

🖏 STM32 ST-LINK	Utility								-			
<u>File Edit View</u>	Target ST-L	INK External	Loader <u>H</u> elp									
STM32 ST-LINK	CL 🤌 🕥 Utility	(🙆 🔜			_							
<u>File Edit View</u>	sT-L	INK External	Loader <u>H</u> elp									
Memory display	00000 🗸 Siz	e: 0x1388	C Data Wid	dth: 32 bits 🔻						Device Device II	Device Information STM32F40xx/F41xx 0 0x413	
										Revision	ID Rev Z	
Device Memory @ 0	×08000000 : F	File : FFB2014-0.	.99.hex Compar	rison: Device Mer	nory Vs [FFB2014-0.99.hex]		Incode 4 o oc		[0, 000000	Flash siz	e 1MBytes	
Address	yet memory, Address range: [UXU8000000 UXU801388C]							Autress a	ange: [UXU80000	00 0x08013880	ASCII	
0x08000000	20010000	9 0800115D	08000705	08000709	1		20010000	0800115D	08000705	08000709	1	
0x08000010	0800070D	08000711	08000715	00000000			0800070D	08000711	08000715	00000000		
0x08000020	00000000	00000000	00000000	08000719			00000000	00000000	00000000	08000719		
0x08000030	0800071D	00000000	08000721	08000725			0800071D	00000000	08000721	08000725	%	
0x08000040	080011C5	080011C7	080011C9	080011CB	AÇÉE		080011C5	080011C7	080011C9	080011CB	ÅÇÉ	
0x08000050	080011CD	080011CF	080011D1	080011D3	ÍĬŇÓ		080011CD	080011CF	080011D1	080011D3	ÍĪŇÓ	
0x08000060	080011D5	080011D7	080011D9	080011DB	õ×ÙÛ		080011D5	080011D7	080011D9	080011DB	Õ×ÙÛ	
0x08000070	080011DD	080011DF	08000A49	080011E3	ÝBIã		080011DD	080011DF	08000A49	080011E3	ÝBIã	
0x08000080	080011E5	080011E7	080011E9	080011EB	åçéë		080011E5	080011E7	080011E9	080011EB	åçéē	
0x08000090	080011ED	080011EF	080011F1	080011F3	íīñó		080011ED	080011EF	080011F1	080011F3	íīñó	
0x080000A0	080011F5	080011F7	080011F9	080011FB	$\tilde{o}\ldots \div \ldots \dot{u}\ldots \hat{u}\ldots$		080011F5	080011F7	080011F9	080011FB	õ÷ùû	
0x080000B0	080007B9	080011FF	08001201	08001203	1ÿ		080007B9	080011FF	08001201	08001203	1ÿ	
0x080000C0	08001205	08001207	08001209	08000951	Q		08001205	08001207	08001209	08000951	Q	
0x080000D0	08000999	0800120F	08001211	08001213	тм		08000999	0800120F	08001211	08001213	тм	
0x080000E0	08000A1D	08001217	08000729	0800121B)		08000A1D	08001217	08000729	0800121B)	
1.0000000	09001210	00001215	09001221	00001000	1 #		0900121D	00001 21 E	00001221	00001222	1 ÷	
17:46:35 : Verificatio 17:46:35 : Verificatio 17:50:24 : No differe This file i 17:51:52 : No differe	nory programme onOK ence found. s already downk ence found.	o an 25 and 200	115.] .					•
This file i 17:52:42 : No differe This file i 17:53:59 : No differe	s already downk ence found. s already downk ence found	oaded.										

This file is already downloaded. 17:52:42 : No difference found. This file is already downloaded. 17:53:59 : No difference found

Step 19:

Refer to the below picture, evidence that the Discovery Controller is now disconnected from the ST-Link software. Almost there.



Step 20:

Navigate to 'Control Panel > Hardware and Sound > devices and Printers> and ensure your 'MMos ForceFeedback2014' Device is detected. © Beano

