- FREEDOM OF SPEECH - or lets finish some of the multi- sega kit.....................

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I don't know about most of the individuals that installed Clay's Multi-Sega kit, but I like it for the most part. After playing for about 10 minutes though I realized something had to be done about the speech board at the least. Since I had a Star Trek speech board to begin with the other games (Zector and Space Fury) would ramble Star Trek garbage that made no sense. Although my son and I got a kick out if it for about 2 minutes........
I wanted to try to finish this kit a little more then it was and not have to swap roms to hear the right speech on different games.

So begins the multi-sega kit speech board hack ;)

What this hack will do-

This hack will make your speech board automatically load the correct code for the games that use the speech PCB. These include Star Trek, Space Fury and Zector. NOTE because the sound board is not reset between games it may occasionally hang when switching games but reseting to the menu and trying again clears it up. I am working on a simple fix to reset the sound board indivual of the CPU board between games to clear this up.

What this hack will NOT do-

This hack does not address the issue of replacing or adding the different sound PCB's such as the Universal Sound board, Elim/Zec sound board and so on. I'll leave this for another hack/upgrade doc.

NOTE- If you do this hack and mess up your speech pcb, game or yourself don't blame me. If you can't handle this hack then please don't do it.

        Parts needed for this hack -

27C010 Eprom (or equiv 128k*8 eprom)
27C32 Eprom (or equiv 4k*8 eprom)
Combined rom images (or the ability to combine them)
Wire, ability to soldier and read a schematic.

Remove u7,u6,u5,u4 and u3 from you sega speech pcb.

MAKE SURE YOUR SEGA SPEECH BOARD IS JUMPERED FOR 2732
EPROMS IN THE U3, U4, U5 AND U6 POSITIONS.
U7 MUST BE JUMPERED FOR 2716.

Refer to the schematics to be sure. If your pcb has a 2716 in U7 and the rest are 2732's then your okay.

Lets dig into it.

Looking at the doc's that came with the Multi Sega, Clay has added the ability to bank switch sound boards and speech boards. This is a great plus as without this latch byte this hack would be impossible without redesign of the whole kit and code.....He actually has two 1 byte latches but we are only concerned with latch 1.

Info from Multi-Sega installation manual-

LATCH1-

	D7654 3210	SOUND BOARD
STAR TREK	0001 0000	(USB)
ELIMINATOR	0010 0001	(ELIM/ZEK)
SPACE FURY	0100 0010	(SF)
TAK/SCAN	0001 0011	(USB)
ZECTOR	0010 0100	(ELIM/ZEK)
ELIM 2P	0010 0101	(ELIM/ZEK)
ELIM 4P	0010 0110	(ELIM/ZEK)
SF (ORIGINAL)	0100 0111	(SF)

If we disregard the top bits D5-D7 and just focus on the 3 lower bits we can derive this.

	D210
LATCH1	
STAR TREK	000
SPACE FURY	010
ZECTOR	100
SF (ORIGINAL)	111

These are the bit patterns we need to enable the different roms for each of the games that use speech. At first glance it looks unfriendly but if you think about it there is a way around it. You could either use some crazy logic to decode these four different 3 bit patterns then bank switch the eprom with that or you can do it the easy way (ilbiet wasteful). Since eproms are cheap I am taking the easy way.

Star Trek and Zector use the same code in the U7 eprom. Space Fury uses different code in U7. U7 is a 27C16 in both games so if we burn a 27C32 with Star Trek in the bottom half and Space Fury in the top half and use the A11 pin we can bank switch with D1 of latch1.

So go ahead and burn a 27C32 with the combined Star Trek and Space Fury U7 Roms or my file.
Bend pin 21 (A11) up on the 27C32 and plug it into the U7 socket on your speech board. Run pin 21 (A11 of 27C32) to D1 of latch1 on the multi sega.

Now combine and burn a 27C010 eprom according to the table below or use the code I combined ;)

Bend up pins 1,2,3,4,22,24,28,29,30,31 and 32 on the 27C010.
Place the 27c1001 into the U5 socket. Line the bottom of the 27C010 up with the bottom of the socket so the top stick over the socket.

1,32,31 goto +5v someplace on the speech board
22,24 together to pin 8 of u14 on the speech board
4 to pin 35 of u14
28 to pin 36 of u14
29 to D0 latch1 on the multi-kit
3 to D1 latch1 on the multi-kit
2 to D2 latch1 on the multi-kit

Put you pcb back in and give it a try.

Thats if for now. I'll compile the roms and go through these while installing this hack to be sure all is correct. If you find errors please let me know. If you damage your pcbs using this hack your on your own. If you think of an easy way to reset just the sound board between games give me an email.

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-----------------------------------------------------------------
SPACE FURY SPEECH ROM NUMBERING

U3        N/A
U4        972        2732
U5        971        2732
U6        970        2732
U7        808        2716


STAR TREK SPEECH ROM NUMBERING

U3        N/A
U4        N/A
U5        1872       2732
U6        1871       2732
U7        1607       2716

ZECTOR SPEECH ROM NUMBERING

U3        N/A
U4        1610       2732
U5        1609       2732
U6        1608       2732
U7        1607       2716
-----------------------------------------------------------------

37C32 MEMORY LAYOUT 4KX8 EPROM

000       U7 STAR TREK/ZECTOR SPEECH ROM
7FF

800       U7 SPACE FURY SPEECH ROM
FFF
-----------------------------------------------------------------

27C1001 MEMORY LAYOUT 128KX8 EPROM

STAR TREK SPEECH ROMS
00000     U6
00FFF
01000     U5
01FFF
02000     U4 OR FILL
02FFF
03000     U3 OR FILL
03FFF
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STAR TREK FILLER
04000     U6
04FFF
05000     U5
05FFF
06000     U4 OR FILL
06FFF
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07000      U3 OR FILL
07FFF
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SPACE FURY SPEECH ROMS
08000      U6
08FFF
09000      U5
09FFF
0A000      U4
0AFFF
0B000      U3 OR FILLER
0BFFF
---------
SPACE FURY FILLER
0C000      U6
0CFFF
0D000      U5
0DFFF
0E000      U4
0EFFF
0F000      U3 OR FILLER
0FFFF
----------
ZECTOR SPEECH ROMS
10000      U6
10FFF
11000      U5
11FFF
12000      U4
12FFF
13000      U3 OR FILLER
13FFF
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STAR TREK FILLER
14000      U6
14FFF
15000      U5
15FFF
16000      U4 OR FILL
16FFF
17000      U3 OR FILL
17FFF
----------
SPACE FURY FILLER
18000      U6
18FFF
19000      U5
19FFF
1A000      U4
1AFFF
1B000      U3 OR FILLER
1BFFF
----------
SPACE FURY SPEECH ROMS
1C000      U6
1CFFF
1D000      U5
1DFFF
1E000      U4
1EFFF
1F000      U3 OR FILLER
1FFFF
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