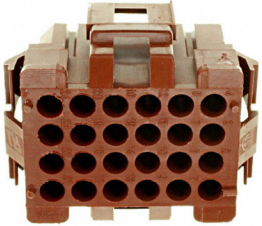


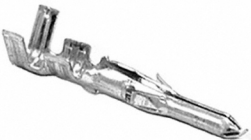

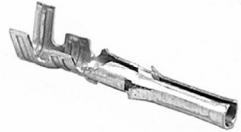

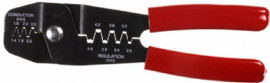




Space Duel Control Panel Wiring Adapter to Play Gravitar Board in a Space Duel Cabinet

Parts Required:

Description	Mfr, Part#	Source, Part#	Quantity	Approximate Cost	Comments	Picture
Plug, 24 position, 0.165" pitch, 4x6, 640 series, accepts female sockets	Tyco, 1-640525-0	Digikey, A14118-ND	1	\$3.53	Picture view is from rear (wire entry)	
Receptacle, 24 position, 0.165" pitch, 4x6, 640 series, accepts male pins	Tyco, 1-640515-0	Digikey, A14108-ND	1	\$3.50	Picture view is from rear (wire entry)	
18-26 awg Crimp Pin, 0.062", Tin, bulk	Tyco, 640545-1	Digikey, A14199-ND	13	\$0.336		
18-26 awg Crimp Pin, 0.062", Gold, cut tape	Tyco, 350967-2	Digikey, A100582CT-ND	13	\$0.54	alternate for above	no pic
18-26 awg Crimp Pin, 0.062", Tin, bulk	Molex, 02-06-2103	Digikey, WM1000-ND	13	\$0.292	alternate for above	
18-26 awg Crimp Socket, 0.062", Tin, bulk	Tyco, 641300-1	Digikey, A14197-ND	13	\$0.36		

Description	Mfr, Part#	Source, Part#	Quantity	Approximate Cost	Comments	Picture
18-26 awg Crimp Socket, 0.062", Gold, cut tape	Tyco, 641294-2 641300-2	Digikey, A100809CT-ND	13	\$0.76	alternate for above	no pic
18-26 awg Crimp Socket, 0.062", Tin, bulk	Molex, 02-06-1103	Digikey, WM1001-ND	13	\$0.21	alternate for above	
0.062" terminal removal tool	Molex, HT2285, 11-03-0002, WM9929	Digikey, WM9929-ND	1	\$18.62	Optional tool makes removing terminals from housings easy. You'll be glad you have this tool if you stick a terminal into the wrong hole.	
Universal Crimp Tool	Molex, 63811-1000	Digikey, WM9999-ND	1	\$55.85	This tool is too expensive but is shown here for informational value. Such crimp tools are sourced locally and cheaply at most electrical supply stores.	
Crimp Tool for 26 awg to 16 awg	TNI-U TU-190-07	Minitake 30108	1	\$21.22 shipped	I haven't tried this but the price is right. Try this at your own risk.	
Hookup wire, 22 awg, stranded, tinned, PVC	General, C2016A-12-01	Digikey, C2016B-100-ND	1	\$18.79	Much cheaper wire is available from other sources.	



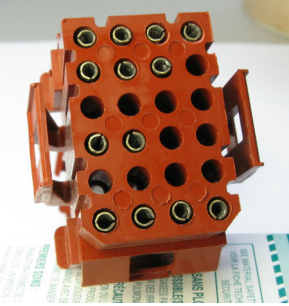

Assembly:

1. Cut 13 pieces of 22 awg stranded hookup wire each 6" long.
2. Strip 0.1" of insulation from each end of each wire.
3. Crimp a male pin terminal to one end of each wire.
4. Crimp a female socket terminal to the other end of each wire.
5. Following the connection list on the next page, insert the terminals of each wire (completing both ends of one wire at a time) into the housings. Insert the terminals from the rear of the housing until they click and lock into place. Be careful as once the terminal locks into place, it can only be removed by a special extraction tool.

Notes:

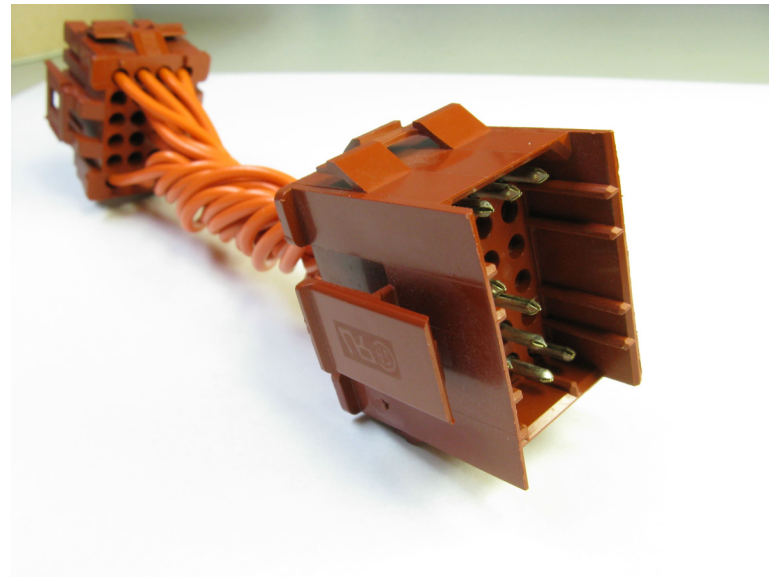
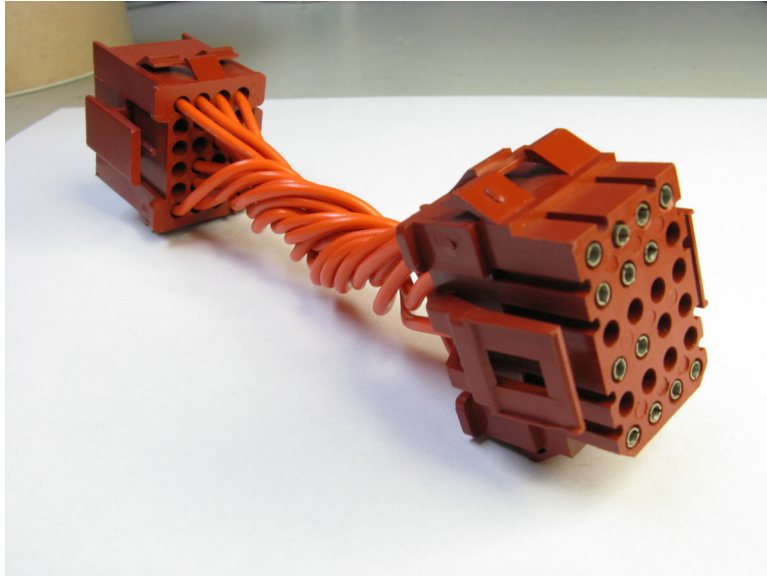
1. The terminals have two sets of "wings". The small set crimps to the bare wire. Crimp this set first. The large set crimps to the insulation. Crimp this set using a larger die on the crimping tool. Do not crimp the insulation so tightly as to destroy it.
2. The holes of the housings are numbered on the wire entry end of the housing.
3. The hole numbers on the housings are mirrored with respect to a plug and a receptacle.
4. After finishing the insertion of all of the wires, it is good practice to check all of the wires end to end using a continuity meter (beeping ohmmeter).

Connection List:

<p>Control Panel End Plug housing with female sockets Terminal Number</p> 	<p>Game Harness End of Adapter Receptacle housing with male pins Terminal Number</p> 
1	11
2	3
3	9
4	14
5	5
6	13
7	7
13	6
14	4
21	21
22	22
23	23
24	24



Finished Adapter:



Filename: "Biltronix_Space_Duel_Control_Panel_Wiring_Adapter_to_Play_Gravitator.doc"
By: William J. Boucher, Created: Apr. 14, 2010, Revised: Aug. 7, 2012
<http://www.biltronix.com> , email: woucher6@cogeco.ca



Before and After Installation in Space Duel:

