

GEMINI ROBOT KITS

Propulsion Computer Assembly Instructions

Parts List

DESCRIPTION	QTY	PART #
<u>Resistors</u>		
620 ohm (BLU-RED-BRN-GOLD)	1	CCF25620 ohm
1K ohm (BRN-BLK-RED-GOLD)	5	CCF251K
1.8K ohm ((BRN-GRY-RED-GOLD)	4	CCF251.8K
2.7K ohm (RED-VIOLET-RED-GOLD)	1	CCF252.7K
4.7K ohm ((YEL-VIOLET-RED-GOLD)	1	CCF254.7K
6.2K ohm (BLU-RED-RED-GOLD)	4	CCF256.2K
6.8K ohm (BLU-GRY-RED-GOLD)	2	CCF256.2K
10K ohm (BRN-BLK-ORG-GOLD)	5	CCF2510K
33K ohm ((ORG-ORG-ORG-GOLD)	1	CCF2533K
47K ohm (YEL-VIOLET-ORG-GOLD)	2	CCF2547K
10M ohm (BRN-BLK-BLU-GOLD)	1	CCF2510M
10K Resistor packs	3	CRN1019-10KJ
<u>Diodes</u>		
1N4148 or 1N914	5	1N4148/1N914
1N4001	2	1N4001
<u>Capacitors</u>		
10 microfarad 16v Electrolytic	3	CRE10MF16v
47 pF (470K)	2	CK05BX470K
.1 microfarad (104)	5	SR205E104M-AA
100 Microfarad 16v Electrolytic	3	CAE100MF16v
4.7 microfarad 35v Electrolytic	2	CRE4.7MF35v
<u>Transistors</u>		
PN2222	5	PN2222A
PN2907	1	PN2907A

Misc.

TIP - 125	2	TIP - 125
1M HZ Xtal (metal can)	1	E100
RS232 Connector (Black)	1	206584-1
4 position dip switch	1	B004
PKT -12 relays (clear to ps)	2	275-213
4-40 1/2 screw	2	91783A110
4-40 hex nuts	2	91841A005

Sockets

40 pin socket	1	ICN-406-S5-T
28 pin socket	2	ICN-286-S5-T
24 pin socket	2	ICN-246-S5-T
20 pin socket	2	ICN-203-S3-T
16 pin socket	4	ICN-163-S3-T
14 pin socket	6	ICN-143-S3-T
8 pin socket	2	ICN-083-S3-T
6 pin socket	4	ICN-063-S3-T

ICs

R65C02P2	1	R65C02P2
74HC00	1	74HC00
74HC04	2	74HC04
74HC139	1	74HC13
CDP1878	2	CDP1878CE
74HC4040	1	74HC4040
74HC14	1	74HC14
74HC367	1	74HC367
74C74	1	74C74
ICL7621	1	ICL7621CCPD
ICL7660	1	ICL7660CPA
HM6116LP-4 or 3	1	HM6116LP-4
27C16	1	27C16045
74HC175	1	74HC175
74HC244	2	74HC244
MM74HC03/MC74HC03	1	MM74HC03
TIL-113	4	TIL-113

Headers

10 pin single male	4	929834-01
4 pin molex (white)	1	09-74-1041

Procon circuit board	1	Procon bd.
----------------------	---	------------

Assembling the Procon Board

1. Insert and solder all sockets into their proper location.

- () U11 - 8 pin socket
- () U9 - 16 pin socket
- () U10 - 14 pin socket
- () U15 - 16 pin socket
- () U17 - 14 pin socket
- () U8 - 14 pin socket
- () U12 - 8 pin socket
- () U2 - 14 pin socket
- () U18 - 14 pin socket
- () U3 - 14 pin socket
- () U4 - 16 pin socket
- () U7 - 16 pin socket
- () Opt 1 6 pin socket
- () Opt 2 6 pin socket
- () Opt 3 6 pin socket
- () Opt 4 6 pin socket
- () U1 - 40 pin socket
- () U14 - 24 pin socket
- () U6 - 28 pin socket
- () U16 - 20 pin socket
- () U13 - 24 pin socket
- () U5 - 28 pin socket
- () U19 - 20 pin socket

2. Insert and solder all resistors into their proper location, and cut off excess lead length.

- () R7 - 2.7K ohm (RED-VIOLET-RED-GOLD)
- () R10 - 6.2K ohm (BLU-RED-RED-GOLD)
- () R9 - 6.2K ohm (BLU-RED-RED-GOLD)
- () R14 - 10K (BRN-BLK-ORG)
- () R15 - 10K (BRN-BLK-ORG)
- () R30 - 1K (BRN-BLK-RED-GOLD)
- () R26 - 1K (BRN-BLK-RED-GOLD)

() R29 - 10K (BRN-BLK-ORG-GOLD)
 () R3 - 6.2K (BLU-RED-RED-GOLD)
 () R27 - 10K (BRN-BLK-ORG-GOLD)
 () R4 - 6.2K ohm (BLU-RED-RED-GOLD)
 () R5 - 620 ohm (BLU-RED-BRN-GOLD)
 () R28 - 10K ohm (BRN-BLK-ORG-GOLD)
 () R19 - 6.8K ohm (BLU-GRY-RED-GOLD)
 () R18 - 47K ohm (YEL-VIOLET-ORG-GOLD)
 () R20 - 1K ohm (BRN-BLK-RED-GOLD)
 () R22 - 6.8K ohm (BLU-GRY-RED-GOLD)
 () R21 - 47K ohm (YEL-VIOLET-ORG-GOLD)
 () R25 - 1K ohm (BRN-BLK-RED-GOLD)
 () R8 - 1K ohm (BRN-BLK-RED-GOLD)
 () R6 - 10M ohm (BRN-BLK-BLU-GOLD)
 () R2 - 33K ohm (ORG-ORG-ORG-GOLD)
 () R1 - 4.7K ohm (YEL-VIOLET-RED-GOLD)
 () R16 - 1.8K ohm (BRN-GRY-RED-GOLD)
 () R17 - 1.8K ohm (BRN-GRY-RED-GOLD)
 () R23 - 1.8K ohm (BRN-GRY-RED-GOLD)
 () R24 - 1.8K ohm (BRN-GRY-RED-GOLD)

3. Insert and solder the diodes into their proper locations,
and cut off excess lead length.

() D2 - 1N4148/1N914
 () D1 - 1N4148/1N914
 () D3 - 1N4148/1N914
 () D4 - 1N4148/1N914
 () D6 - 1N4001
 () D7 - 1N4001
 () D5 - 1N4148/1N914

4. Insert and solder the capacitors into their proper locations,
and cut off the excess lead length.

() C5 - 10 microfarad 16v Electrolytic
 () C4 - 10 microfarad 16v Electrolytic
 () C1 - 10 microfarad 16v Electrolytic
 () C7 - 4.7 microfarad 35v Electrolytic
 () C8 - 4.7 microfarad 35v Electrolytic
 () C2 - 47 pF (470K)
 () C3 - 47 pF (470K)
 () C15 - .1 microfarad (104)
 () C12 - .1 microfarad (104)
 () C14 - .1 microfarad (104)
 () C11 - .1 microfarad (104)

- () C13 - .1 microfarad (104)
- () C6 - 100 VF 16v (Electrolytic)
- () C9 - 100 VF 16v (Electrolytic)
- () C10 - 100 VF 16v (Electrolytic)

5. Insert and solder the transistors into their proper locations, and cut off the excess lead length.

- () Q4 - PN2222
- () Q3 - PN2222
- () Q1 - PN2907
- () Q2 - PN2222
- () Q6 - PN2222
- () Q5 - PN2222

6. Insert and secure the regulators with a screw and nut then solder into their proper location.

- () Q7 - TIL - 125
- () Q8 - TIL - 125

7. Insert and solder the crystal into its proper location.

- () Y1 - 1M HZ (metal can)

8. Insert and solder the RS232 connector in its proper location.

- () J3 - RS232

9. Cut or break the headers to their proper size then insert and solder them in their proper location with the small pins going into the circuit board.

- () J2 - 10 pin single male
- () J4 - 10 pin single male
- () J6 - 10 pin single male
- () J5 - 10 pin single male

10. Insert the resistor packs into the circuit board so that the end with the circle printed on it is at the square on the circuit board in their proper locations.

- () R11 10K resistor pack
- () R12 10K resistor pack
- () R13 10K resistor pack

11. Insert the molex header with the lip toward the inside of the circuit board and solder at its proper location. Make sure all the pins go through the board. This is a tight fit.

() J1 - 4 pin molex (white)

12. At this point we recommend that you clean the circuit board. You can either use alcohol and a scrub brush or purchase Flux Remover at your nearest electronics supply store.

13. Insert and solder the dip switch in its proper location. Make sure switch one is at the end where pin 1 is marked on the circuit board.

() SWT 1 - 4 position dip switch

14. Insert and solder the relays into their proper locations.

() L1 - RKT - 12

() L2 - RKT - 12

15. Insert a piece of 1" bare wire (a discarded piece of resistor lead which has been trimmed off the back of the board will do) into the center hole on JWI and insert the other end into the hole to the left of the center hole.

16. Spot clean the back of the circuit board where you just soldered.

17. Insert the ICs into their proper socket. Make sure that the legs on the chips go into the holes on the sockets properly and do not bend underneath the chip. BE CAREFUL ABOUT STATIC.

() U11 - ICL7621

() U16 - 74HC244

() U9 - 74HC367

() U10 - 74C74

() U15 - 74HC175

() U17 - 74HC04

() U8 - 74HC14

() U12 - ICL7660

() U2 - 74HC00

() U18 - MM74HC03/MC74HC03

() U3 - 74HC04

() U4 - 74HC139

() U7 - 74HC4040

() Opt 1 - TIL - 113

() Opt 2 - TIL - 113

- () Opt 3 - TIL - 113
- () Opt 4 - TIL - 113
- () U1 - R65C02P2
- () U14 - 27C16 Procon Ver. 3.13
- () U6 - CDP1878
- () U19 - 74HC244
- () U13 - 6116LP-4 or 3
- () U5 - CDP-1878

The board is now complete.

