

GEMINI ROBOT KITS

Main Computer Assembly instructions

Parts List

DESCRIPTION	QTY	PART #
<u>Resistors</u>		
200 ohm (RED-BLK-BRN-GOLD)	1	CCF25200
1h ohm (BRN-BLK-RED-GOLD)	4	CCF251K
2.7K ohm (RED-VIOLET-RED-GOLD)	1	CCF252.7K
4.7K ohm (YEL-VIOLET-RED-GOLD)	3	CCF254.7K
6.2K ohm (BLU-RED-RED-GOLD)	3	CCF256.2K
10K ohm (BRN-BLK-ORG-GOLD)	7	CCF2510K
27K ohm (RED-VIOLET-ORG-GOLD)	1	CCF2527K
100K ohm (BRN-BLK-YEL-GOLD)	5	CCF25100K
200K ohm (RED-BLK-YEL-GOLD)	2	CCF25200K
1M ohm (BRN-BLK-GRN-GOLD)	1	CCF251M
10 M ohm (BRN-BLK-BLU-GOLD)	1	CCF2510M
10K ohm Resistor Pack (Black,10pin)	2	CRN1019-10KJ
<u>Capacitors</u>		
.1 microfarad (104)	1	SR205E104-AA
27 pF (270K)	4	CKO5BX270K
.01 microfarad (103K)	12	CKO5BX103K
100 microfarad 16v Electrolytic	3	CRE100MF16v
10 microfarad 16v Electrolytic	2	CRE10MF16v
* There are no caps used for 014, 24.		
<u>Diodes</u>		
1N34A	2	1N34A
1N914 or 1N4148	20	1N914
<u>Transistors</u>		
2N2222	1	2N2222A
PN2222	5	PN2222A

misc.

4.0 M HZ Xtal (small can)	1	E400
2.09 MH Xtal (large can)	1	2.09 M HZ
4 positions DIP Switch	1	BD04
4.8 v battery	1	MMB4.8
jumper (black)	1	925250-R
Card edge connectors	4	H421121-25
4-40 1/2 nylon screws	8	94611A110
4-40 nylon nuts	8	94B12A112

Headers

2 pin single male	1	929834-01
3 pin single male	2	929834-01
4 pin single male	1	929834-01
5 pin single male	1	929834-01
8 pin single male	1	929834-01
10 pin single male	5	929834-01
26 pin double male	2	929836-01
34 pin double male	1	929836-01
40 pin double male	1	929836-01
4 pin molex (white)	1	09-74-1041

Sockets

40 pin sockets	6	ICN-406-55-T
28 pin sockets	9	ICN-286-55-T
24 pin sockets	2	ICN-246-55-T
20 pin sockets	4	ICN-203-53-T
16 pin sockets	7	ICN-143-53-T
14 pin sockets	11	ICN-143-53-T
8 pin sockets	2	ICN-083-53-T

ICs

R65C02P2	1	R65CC2P2
74HC245	1	74HC245
74HC244	3	74HC244
74HC4040	1	74HC4040
74HC51	1	74HC51
74HC04	2	74HC04
74HC14	1	74HC14
74HC00	2	74HC00
74HC138	3	74HC138
74HC74	1	74HC74
74HC32	2	74HC329

74HC139	2	74HC139
6264LP-12	1	6264LP-12
27C64	1	HN27C64G-20
CDP1879	1	CDP1879CE
CDP1878	1	CDP1878CE
ADC0817	1	ADC0817CCN
74HC08	1	74HC08
MM5837	1	MM5837
74LS595	1	74LS595
HD6350	1	HD6350
HD6321	1	HD6321
82C55	3	MSM82C55A-5RS
ICL7641	1	ICL7641CCPD
ICL7660	1	ICL7660CPA

Assembling the Main Computer

1. Insert and solder all the sockets into their proper location.
Take notice as to where pin 1 is located.

() U1 - 40 pin socket
 () U2 - 20 pin socket
 () U5 - 20 pin socket
 () U4 - 20 pin socket
 () U3 - 20 pin socket
 () U21- 28 pin socket
 () U22- 28 pin socket
 () U23- 28 pin socket
 () U24- 28 pin socket
 () U25- 28 pin socket
 () U26- 28 pin socket
 () U27- 28 pin socket
 () U29- 28 pin socket
 () U30- 24 pin socket
 () U31- 28 pin socket
 () U32- 40 pin socket
 () U40- 40 pin socket
 () U39- 40 pin socket
 () U38- 40 pin socket
 () U36- 24 pin socket
 () U19- 16 pin socket
 () U20- 14 pin socket
 () U17- 16 pin socket
 () U18- 16 pin socket
 () U15- 14 pin socket
 () U16- 14 pin socket

- () U14- 16 pin socket
- () U13- 16 pin socket
- () U33- 14 pin socket
- () U28- 14 pin socket
- () U35- 16 pin socket
- () U9 - 14 pin socket
- () U12- 14 pin socket
- () U7 - 14 pin socket
- () U41- 14 pin socket
- () U42- 8 pin socket
- () U11- 14 pin socket
- () U8 - 14 pin socket
- () U6 - 16 pin socket
- () U34- 8 pin socket
- () U37- 40 pin socket

2. Insert and solder all resistors into their proper location.

- () R1 - 4.7K (YEL-VIOLET-RED-GOLD)
- () R2 - 4.7K (YEL-VIOLET-RED-GOLD)
- () R3 - 4.7K (YEL-VIOLET-RED-GOLD)
- () R6 - 100K (BRN-BLK-YEL-GOLD)
- () R7 - 100K (BRN-BLK-YEL-GOLD)
- () R8 - 27K (RED-VIOLET-ORG-GOLD)
- () R9 - 10K (BRN-BLK-ORG-GOLD)
- () R10 - 10K (BRN-BLK-ORG-GOLD) see layout diagram for correct location
- () R4 - 10K (BRN-BLK-ORG-GOLD)
- () R5 - 10K (BRN-BLK-ORG-GOLD)
- () R28 - 100K (BRN-BLK-YEL-GOLD)
- () R30 - 200K (RED-BLK-YEL-GOLD) see layout diagram for correct location
- () R11 - 1M (BRN-BLK-GRN-GOLD)
- () R12 - 200 ohm (RED-BLK-BRN-GOLD)
- () R13 - 1K (BRN-BLK-RED-GOLD)
- () R27 - 100K (BRN-BLK-YEL-GOLD)
- () R25 - 10K (BRN-BLK-ORG-GOLD)
- () R14 - 100K (BRN-BLK-YEL-GOLD)
- () R15 - 6.2K (BLU-RED-RED-GOLD)
- () R26 - 2.7K (RED-VIOLET-RED-GOLD)
- () R16 - 1K (BRN-BLK-RED-GOLD)
- () R17 - 1K (BRN-BLK-RED-GOLD)
- () R18 - 6.2K (BLU-RED-RED-GOLD)
- () R19 - 6.2K (BLU-RED-RED-GOLD)
- () R20 - 10K (BRN-BLK-ORG-GOLD)
- () R21 - 1K (BRN-BLK-RED-GOLD)

- () R23 - 200K (RED-BLK-YEL-GOLD)
- () R22 - 10M (BRN-BLK-ORG-GOLD)
- () R24 - 10K (BRN-BLK-ORG-GOLD)

3. Insert and solder all diodes into their proper location.

- () D1 - 1N34A
- () D2 - 1N34A
- () D3-D22 - 1N914 or 1N4148 (Use the two outer holes for D6.)

4. Insert and solder all capacitors into their proper location.

- () C1 - 100 microfarad 16v Electrolytic
- () C2 - 100 microfarad 16v Electrolytic
- () C3 - .01 microfarad (103K)
- () C4 - .01 microfarad (103K)
- () C5 - 100 microfarad 16v Electrolytic (positive lead towards J1)
- () C7 - .01 microfarad (103K)
- () C8 - .01 microfarad (103K)
- () C9 - .01 microfarad (103K)
- () C10- .01 microfarad (103K)
- () C11- .01 microfarad (103K)
- () C12 - .01 microfarad (103K)
- () C13- .01 microfarad (103K)
- () C17- 27pF (270K)
- () C16- 27pF (270K)
- () C15- .01 microfarad (103K)
- () C18- .1 microfarad (104)
- () C23- .01 microfarad (103K)
- () C19- 10 microfarad 16v Electrolytic
- () C20- 10 microfarad 16v Electrolytic
- () C21- 27 pF (270K)
- () C22- 27 pF (270K)

5. Insert and solder all the transistors into their proper location.

- () Q1 - 2N2222 (metal can)
- () Q2 - PN2222
- () Q3 - PN2222
- () Q4 - PN2222
- () Q5 - PN2222
- () Q6 - PN2222

6. Insert and solder in the resistor packs into their proper location. The square pad on the circuit board marks pin 1 and the circle printed on one end of the resistor pack marks pin 1.
 - () RN1 - 10K resistor pack
 - () RN2 - 10K resistor pack
7. Insert and solder the crystals into their proper locations. Take notice that X1 lies flat against the circuit board and you have to bend the leads and X2 stands straight up.
 - () X1 - 4.0 M HZ
 - () X2 - 2.09 M HZ
8. Insert and solder in the 4 position dip switch into its proper location. Place switch 1 at the pin 1 end.
 - () SW1 - 4 position dip switch
9. Insert and screw the card edge connectors into their proper locations. Slot 1 on the card edge connector (has a square imprint on that end) should be placed so that it is facing the center of the circuit board. Use the nylon screws and nut to secure them, then solder.
 - () J18 - card edge connector
 - () J19 - card edge connector
 - () J21 - card edge connector
 - () J23 - card edge connector
10. Cut or break the headers to given sizes. Insert the shorter pins into the circuit board and solder at the proper locations.
 - () J12 - 10 pin single male
 - () J13 - 10 pin single male
 - () J15 - 10 pin single male
 - () J5 - 3 pin single male
 - () J10 - 10 pin single male
 - () J4 - 10 pin single male
 - () J2 - 34 pin double male
 - () J6 - 4 pin single male
 - () J14 - 8 pin single male
 - () J8 - 26 pin double male

- () J9 - 26 pin double male
- () J22 - 3 pin double male
- () J7 - 5 pin single male
- () J11 - 10 pin single male
- () J1 - 40 pin double male
- () J20 - 2 pin single male

11. Insert and solder the white molex connector in its proper location. Make sure the lip on the connector is facing the inside of the circuit board.

- () J3 - 4 pin white molex

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

13. Insert and solder the battery into its proper location.

- () B1 - MMB4.8v

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

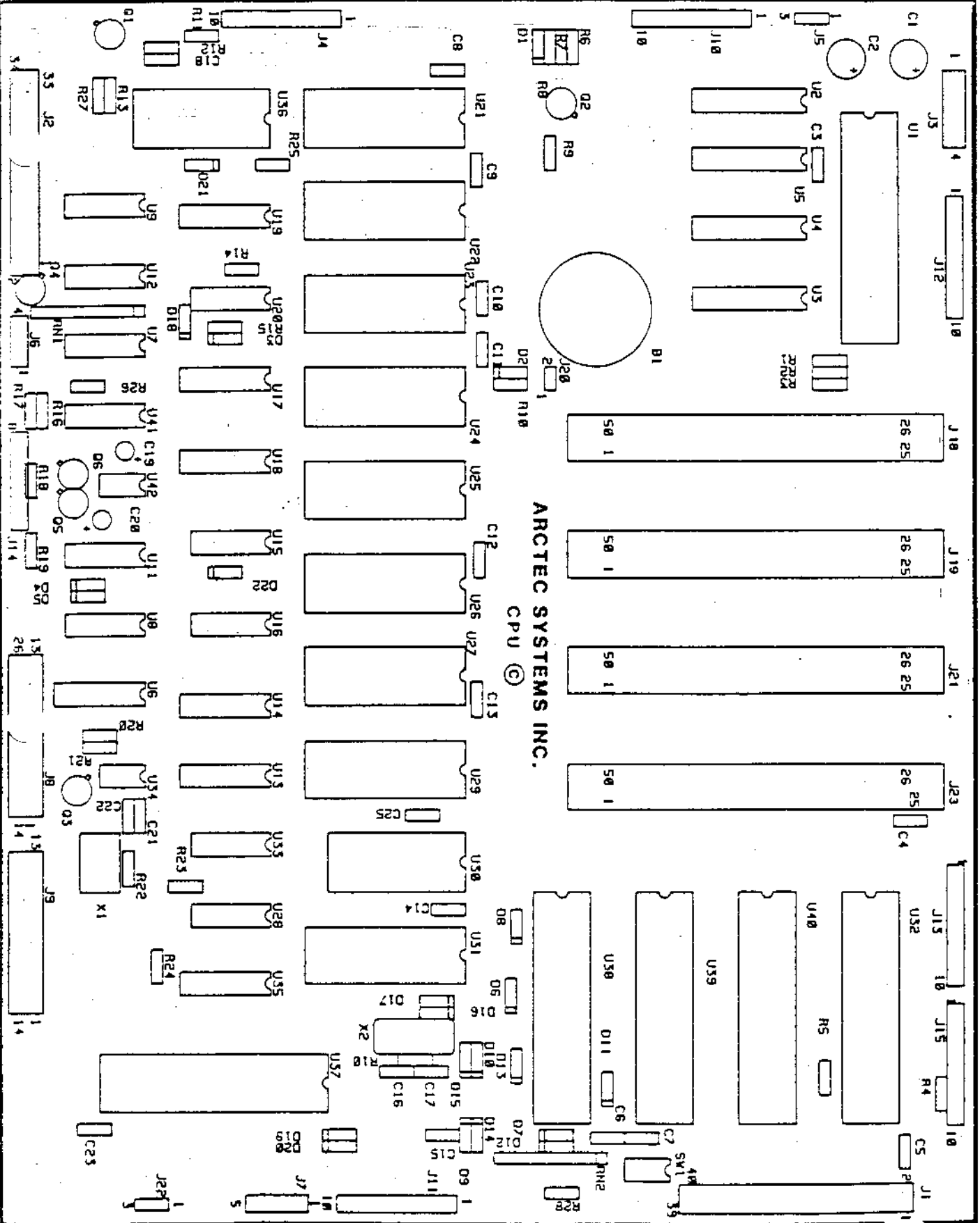
15. Place a piece of electrical tape over the leads of the battery on the back of the circuit board. * Note the tape must be electrical.

16. Insert the Ics into the sockets at their proper locations. Be careful that the legs on the chips go into the sockets properly and do not bend underneath the chip. We recommend that you ground yourself while chipping the board.

- () U1 - 65C02P2 or P3
- () U2 - 74HC245
- () U3-5 - 74HC244
- () U32 - ADC0817
- () U38-40 - 82C55

() U21-27 - 6264LP-12
() U29 - MONITER
() U30 - CDP1879
() U31 - CDP1878
() U36 - HD6350
() U19 - 74HC139
() U20 - 74HC00
() U17 - 74HC138
() U18 - 74HC139
() U15 - 74HC74
() U16 - 74HC32
() U13,14 - 74HC138
() U33 - 74HC04
() U28 - 74HC32
() U35 - 74HC595
() U9 - 74HC14
() U12 - 74HC04
() U7 - 74HC51
() U41 - 7641
() U42 - 7660
() U11 - 74HC00
() U8 - 74HC04
() U6 - 74HC4040
() U34 - 5837
() U37 - 63SC21

The board is now complete.



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