THE 80 - COLUMN - EXPANSION SYSTEM MANUAL

ASSEMBLY INSTRUCTIONS FOR THE 80 COLUMN EXPANSION SYSTEM

CONGRATULATIONS YOU ARE NOW AN OWNER OF THE MECHATRONIC 80 COLUMN-EXPANSION SYSTEM.

THE 80-COLUMN EXPANSION SYSTEM IS AN EXTENSION FOR THE TI 99/4A, WHICH GIVES YOU (WITH PROPER SOFTWARE) 80 COLUMNS AND 26 LINES.
IN THE GRAPHICS MODE,YOU HAVE WITH THE PROPER SOFTWARE 256x212 PIXELS IN 256 COLORS OR 512x121 PIXELS IN 16 COLORS.
THE 80-COLUMN SYSTEM IS ATTACHED TO THE SIDE (I/O PORT) OF THE TI 99/4A.

1.0 ASSEMBLY INSTRUCTIONS:

FIRST YOU MUST DISASSEMBLE THE TI-CONSOLE.THE ONLY TOOL NEEDED IS A PHILLIPS-SCREWDRIVER,AND A PLACE AWAY FROM STATIC-ELECTRICITY.BE SURE NOT TO WEAR WOOL CLOTHIN.

1. TO TAKE THE CONSOLE APART,LAY IT FLAT UPSIDE DOWN ON THE TABLE AND REMOVE THE 7 SCREWS OF THE HOUSING.

2. AFTER YOU HAVE DONE THIS,AND YOU HAVE A BLACK CONSOLE, GENTLY PULL THE SWITCH STRAIGHT FORWARD.

3. REMOVE THE PLASTIC SHELL

4. MARK THE POSITION OF THE SHIELD-CLAMP AND REMOVE IT.

5. REMOVE THE SHIELD AND DISCONNECT THE CONNECTOR FROM THE POWERSUPPLY. (FIG.1)

6. WITH A SMALL SCREWDRIVER PRY LOOSE THE CONNECTOR FROM THE KEY-BOARD.BE VERY CAREFUL WITH THIS CABLE,SINCE IT IS VERRY STIFF AND EASY TO BREAK. (FIG.2)

7. NOW REMOVE THE PC-BOARD,AND REMOVE THE REST OF THE SHIELD (FIG.3)

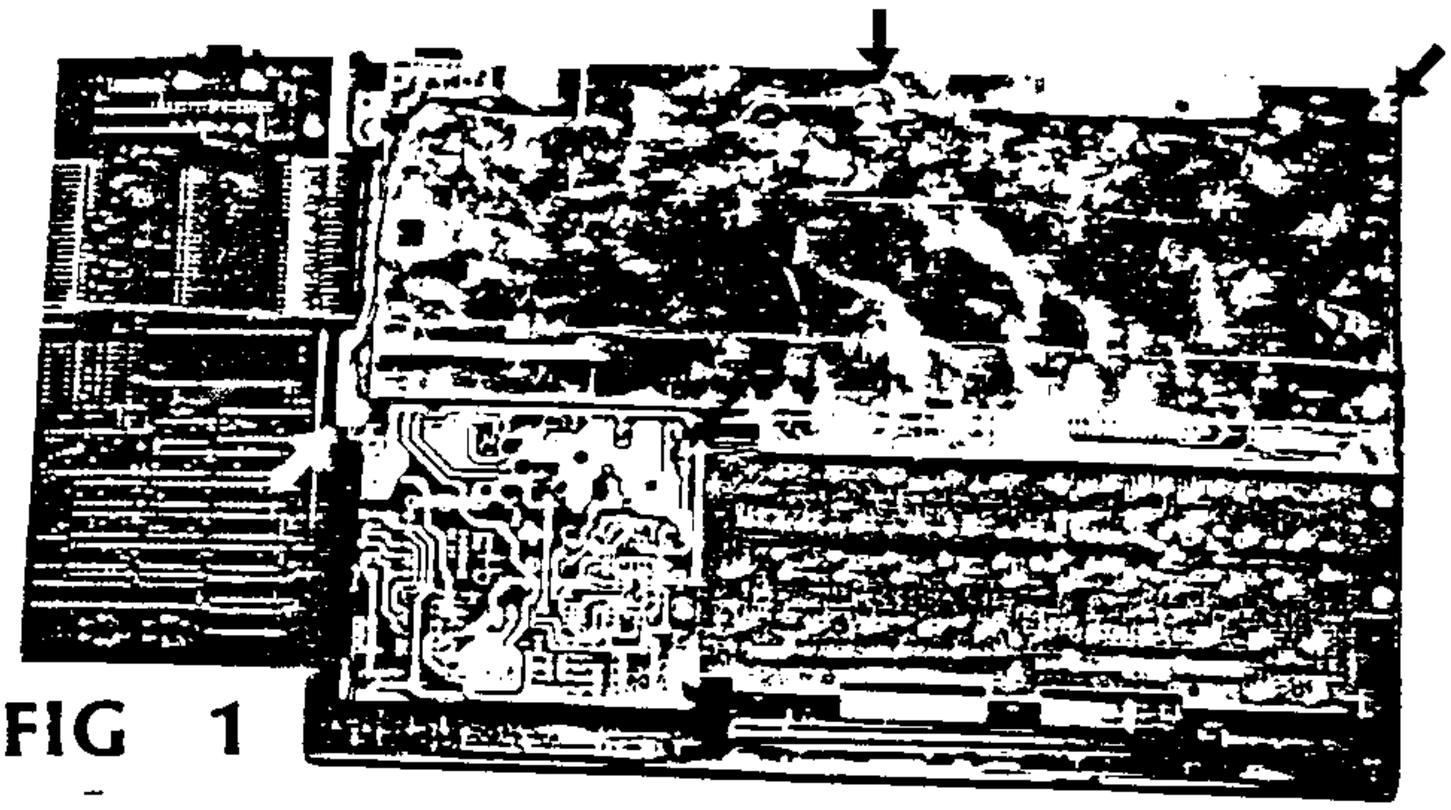


FIG 1

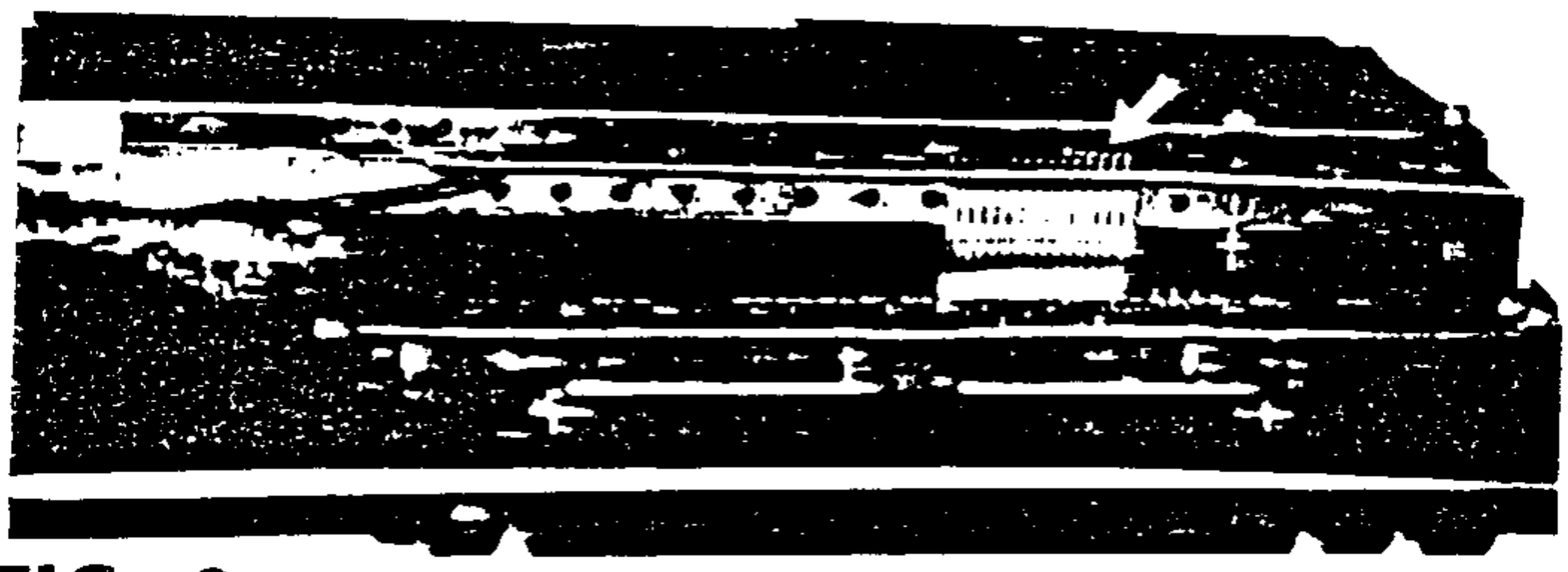


FIG 2

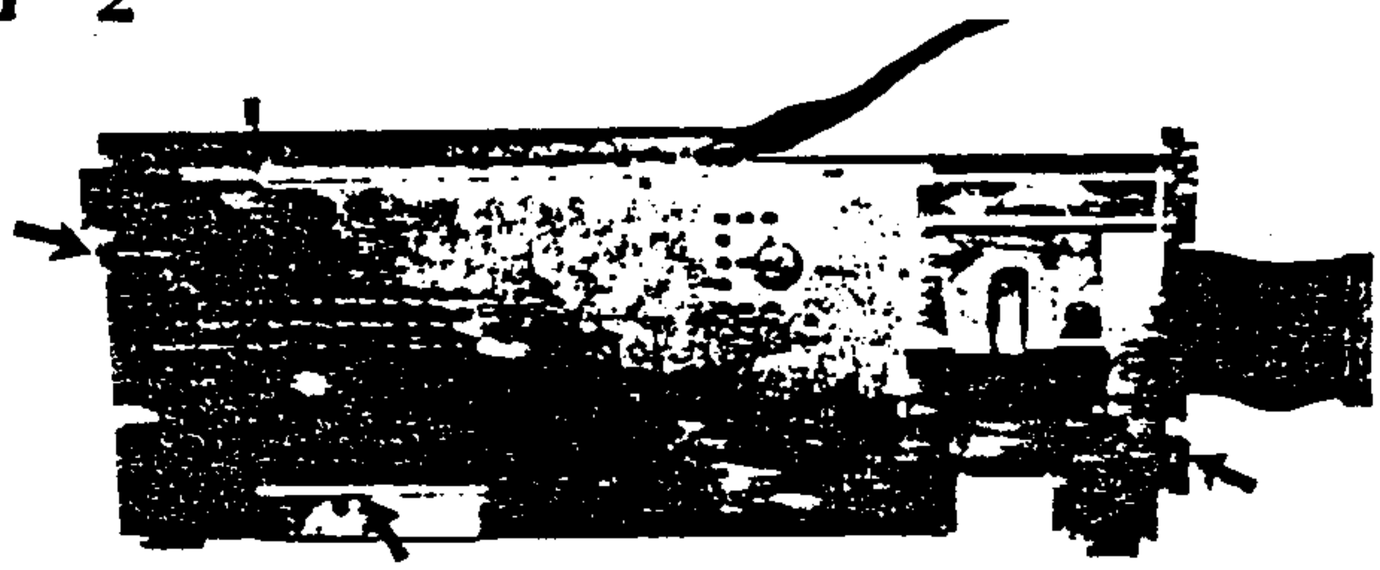
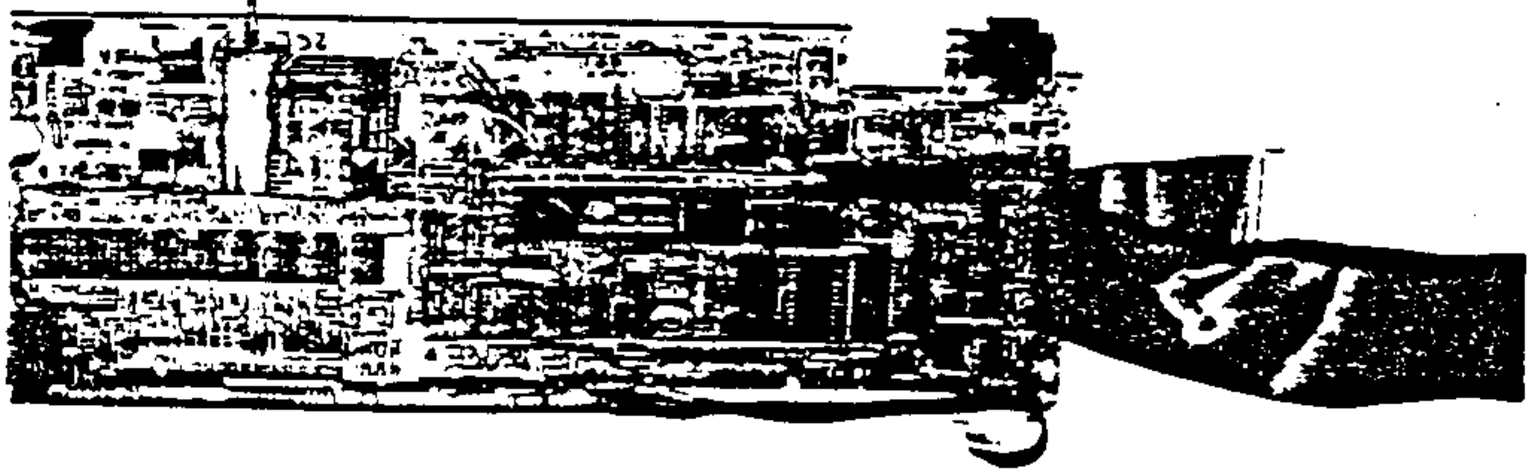


FIG 3

FIG 4



8. REMOVE THE OLD VIDEO-CHIP TMS 9928 OR TMS 9918 CAREFULLY.INSERT A SMALL SCREWDRIVER UNDER THE CHIP AND LIFT IT CAREFULLY OUT OF THE SOCKET.(FIG.4)

9. INSERT THE FLAT RIBBON CABLE INTO THE SOCKET,SO THAT THE BLACK WIRE OF THE CABLE IS CLOSEST TO THE CENTER OF THE PC-BOARD,AND ROUTE IT AROUND THE CARTRIDGE-PORT CONNECTOR.(FIG.5)

10. UNSCREW THE SMALL COPPER CONNTACT PLATE ON THE I/O PORT AND SLIP THE CABLE THROUGH IT,THAN FASTEN IT BACK ON. NOW YOU ARE READY TO REASSEMBLE THE COMPUTER.

11. THIS IS DONE EXACTLY IN THE REVERSED WAY OF THE WAY YOU DISASSEMBLED IT.

12. BE VERY CAREFUL NOT TO SQUEZE ANY WIRE OR SHORT ANY PC TRACES WITH THE COVER.

13. IF EVERYTHING FITS TOGETHER PROPERLY,REMOVE THE 4 PHILLIPS SCREWS ON THE 80 COLUMN-EXPANSION BOX AND LIFT UP THE COVER.

14. INSERT THE RIBBON-CONNECTOR INTO THE CONNECTOR IN THE SYSTEM.(FIG.6)

15. YOU USE YOUR 80 COLUMN-SYSTEM IN THE SAME MANNER AS YOU DID TI99/4A BEFORE ,EXCCEPT THE EXPANSION-SYSTEM HAS TO BE POWERD UP, FIRST WITH THE 5 VOLTS POWER-SUPPLY (THE ROUND CONNECTOR ON THE BACK OF THE CARD).

16. THE MONITOR CONNECTOR (9 PIN CONNECTOR)IS FOR THE RGB MONITOR WITH A TTL SYNC.OUTPUT.

    A VIDEO-COMPOSITE INTERFACE CABLE IS AVAILABLE.

N O T E :
****

A TV SHOULD NOT BE USED,AS THE SCREEN -QUALITY IS VERY POOR.

FIG 5

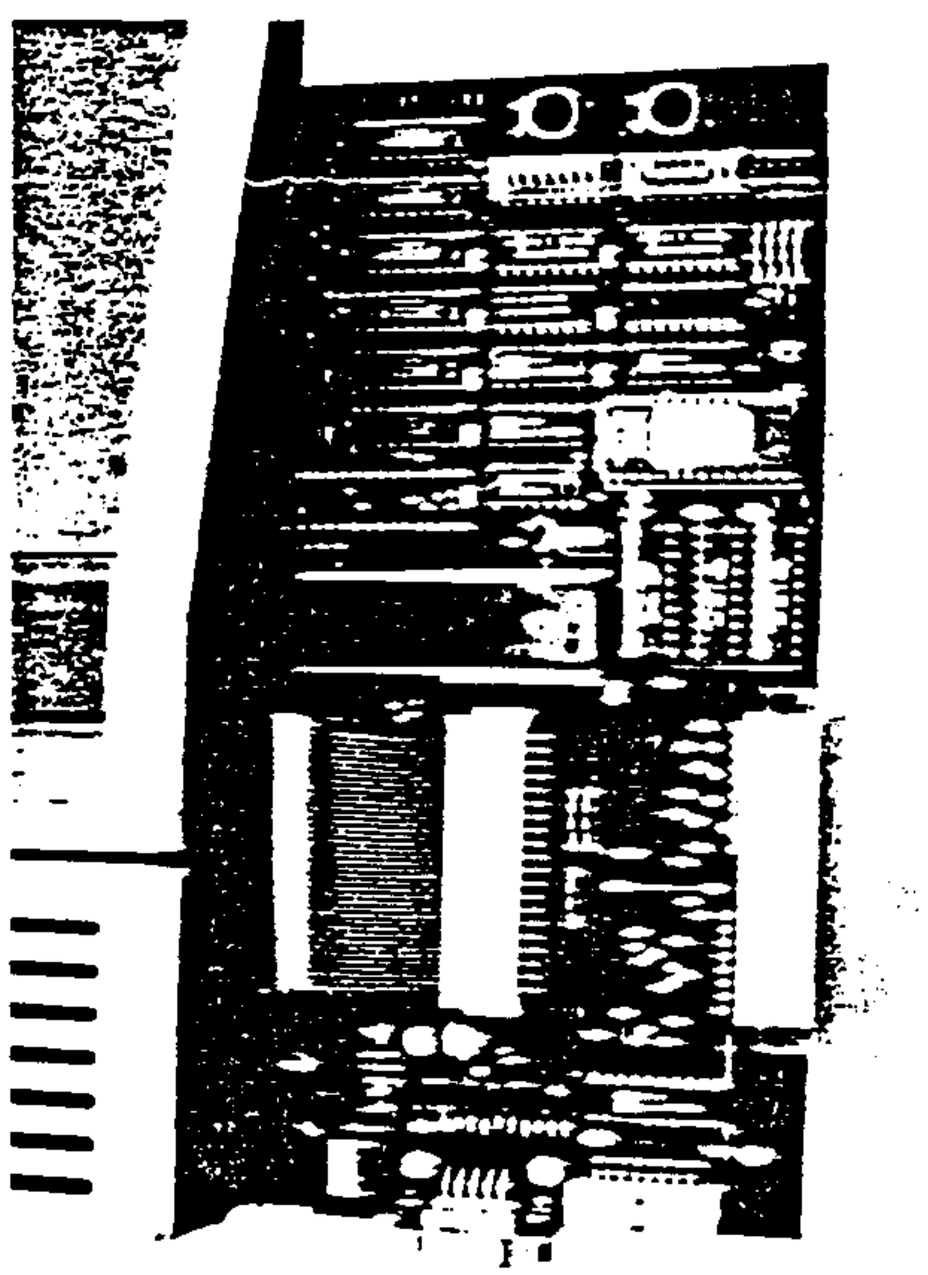


FIG 6

BASIC DIPSWITCH SETTINGS.

2.0. DIPSWITCH SETTINGS :

DIPSWITCH 1:

WITH THIS SWITCH YOU CAN ADJUST THE PICTURE ON YOUR MONITOR IN A CERTAIN RANGE:

S1	ON - UP S1 OFF- DOWN
S2-S4	INTENSITY OF THE MOVEMENT
S5	ON - LEFT S5 OFF RIGHT
S6-S8	INTENSITY OF THE MOVEMENT

DIPSWITCH 2 :

HAS A MULTI-FUNCTION:

S1	OFF - PAL VERSION (VIDEO CONTROLER WORKS IN PAL 50 HZ
S1	ON - NTSC VERSION VIDEO CONTROLLER WORKS TO NTSC SPECIFICATIONS
S2	ON - KEYBOARD INTERUPT IS PERMITTED
S2	OFF - KEYBOARD INTERRUPT IS NOT PERMITTED
S3	ON - US-ASCII IS LOADED
S3	OFF - GERMAN LETTERS ARE LOADED
S4 TO S6	NOT IN USE AT THIS TIME

DIP SWITCH 3 :

DIPSWITCH 3 IS ONLY USED TO SELECT THE CRU - ADDRESS OF THE 80 COLUMN EXANSION SYSTEM

IMPORTANT:

FOR ERROR-FREE OPERATION OF THE CARD,THE ADDRESS HAS TO BE >1000 . NO OTHER ADRESS IS ALLOWED.
FOR THAT REASON ALL SWITCHES HAVE TO BE SET TO "ON"

SHOULD ANOTHER EXPANSION BE SET TO THIS ADDRESS,PLEASE ASK THE MANUFACTURER FOR THE CHANGE OF THIS ADDRESS.
TI USED THIS ADDRESS FOR TESTING,AND THERE SHOULD BE NO OTHER CARD ON IT .

2.1. THE BUTTONS

ON THE PC-BOARD ARE TWO BLACK-BUTTONS,WHICH CAN BE
REACHED WITH A PENCIL THROUGH THE TWO HOLES IN THE COVER.
THIS WAS NECESSARY,BECAUSE TI MADE SOME CONSOLES WITH FALSE
VALUES.IF YOU TURN YOUR CONSOLE ON,AND NOTHING OR UNDEFINED CHARACTERS ARE
VISIBLE,JUST PRESS THE LEFT BUTTON ,AND THE VIDEO-CONTROLLER
OF THE 80 COLUMN-EXPANSION WILL ADJUST FOR THE DIFFERENCE
AND EVERYTHING WILL WORK AS BEFORE.

IF YOU DONT HAVE ONE OF THESE CONSULES SET DIP-SWITCHH 2
S2 TO THE OFF POSITION

THE RIGHT BUTTON HAS NO FUNCTION AT THIS TIME.

3. BUILT-IN SOFTWARE:

THE 80 COLUMN CARD HAS AN EPROM WITH DIVERSE SOFTWARE BUILT IN,
WHICH TAKES OVER AS SOON AS YOU TURN YOUR COMPUTER ON
TO INITIALIZE THE CARD,IT WILL TAKE UP TO 2 SEC.
IN THIS SETTING YOUR TI WILL WORK NORMALLY.
THERE IS ONLY ONE EXCEPTION,THE VDP-RAM IS LOWERED BY 2 BYTES.

4.0.0 TEXT MODES:

FROM THE EXTENDED BASIC OR FROM OTHER MODULES YOU
CAN CALL FOR THE 80-COLUMN.THIS CAN BE DONE EXACTLY LIKE A PRINTER
COMMAND .THE FILE NAME IS"TEXT80".AS FILE TYPE ONLY FILES WITH
DISPLAY AND A FILE LENGTH OF 80 CAN BE CHOSEN.
THE NAME TEXT80 CAN BE EXTENDET IF YOU ADD A PERIOD.

HAVE THE RIGHT CLOSING STATEMENTS,SO THAT THE REGISTERS OF THE
VIDEO-CONTROLER ARE CLEARED AND THE PROGRAM NORMALLY CONTINUES.

4.1.0 "TEXT80". THE NAME TEXT80 CAN BE EXPANDED AS FOLLOWES:

4.1.1 FROM EXTENDED BASIC :

"TEXT80".0000E0002000"

IN EXTENDED BASIC YOU CAN USE THE DEFAULT SETTING:

"TEXT80"

```
100 OPEN #1:"TEXT80.0000E00020000000"
110 FOR X= 1 TO 20
120 PRINT #1:"abcdefghijklmnopqrstuv
    wxyz{|}1234567890ABCDEFGHIJKLMNOPQRSTUVWXYZ[/],!"
130 NEXT X
140 CALL KEY(0,S,T)::IF T=0 THEN 140
150 CLOSE #1
```

WITH THE COMMAND PRINT# YOU ARE ABLE TO WRITE DIRECT TO THE SCREEN
INPUT# OR LINPUT# DATA CAN BE INSERTED THROUGH THE KEY-BOARD.
YOU CAN USE THE NORMAL EDITING KEYS (DELETE , INSERT, AND AROW-KEYS)
IF YOU USE THE PRINT STATEMENT,THE CURSOR IS AUTOMATICALLY RETURNED
AFTER A DATASENTENCE,AND SET TO A NEW BEGINNING LINE.
THE TEXT-MODE IS CLOSED WITH THE STATEMENT CLOSE #1.AND YOUR
COMPUTER SWITCHES BACK TO THE NORMAL MODE.

IMPORTANT :

IF THERE IS A BRAKE OR ERROR DURING A PROGRAM,AND YOU ARE IN THE
TEXT80 MODE THERE COULD BE ERROROUS SYMBOLS ON THE SCREEN.
THROUGH EDITING WITH AN NONEXISTING PROGRAMLINE (1 REM)THE
TEXT-MODE WILL BE CLOSED.

4.2 SPECIAL CONTROL CHARACTERS FOR THE 80 COLUMN-EXPANSION:

THERE ARE SOME SPECIAL CHARACTERS ASSIGNED FOR THE CONTROL OF THE
SOFTWARE.
THEY ARE THE SAME AS YOU WOULD USE FOR A REGULAR PRINTER,IN THE
SAME FORMAT.AS WITH THE REGULAR TI99/4A.

THE TEXT-MODE WILL BE OPENED WITH AN "OPEN" COMMAND.
THE SCREEN WILL BE SET FOR 80 COLUMNS.

4.2.1. CLEARING OF THE SCREEN

WITH THE CONTROL CHARACTER CHAR(17) WILL WIPE THE SCREEN BLANK.
SAME EFFECT AS IN BASIC "CALL CLEAR"

SHOULD YOU HAVE A CONSOLE ON WHICH YOU HAVE TO PRESS THE
LEFT BUTTON THEN YOUR OPENING STATEMENT SHOULD BE :

"TEXT80.0700E0F00CF8"

WITH REGULAR BASIC (WITHOUT PRESSING THE BUTTON)
YOU CAN USE :

"TEXT80.0000E0000C00"

4.1.2 EDITOR-ASSEMBLER:

"TEXT80.0000E0000E01"

4.1.3 TI-WRITER PRINT SECTION :

"TEXT80.0000E0000E01"

THE VALUES ARE AS FOWLLOWS :

THE FIRST TWO DIGITS: 16KBYTE RAM-BANK OF THE VDP-RAM
3RD AND 4TH DIGIT VALUE OF THE VDP-REGISTER 0
5TH AND 6TH DIGIT VALUE OF THE VDP-REGISTER 1
7TH AND 8TH DIGIT VALUE OF THE VDP-REGISTER 2
9TH AND 10TH DIGIT VALUE OF THE VDP-REGISTER 3
11TH AND 12TH DIGIT VALUE OF THE VDP-REGISTER 4

AFTER THIS,2 MORE BYTES CAN BE ADDED AS EXPANSIONS.
THE START ADDRESS OF THE CURSOR ON THE SCREEN .

EXAMPLE: "TEXT80.0000E00020000000"

WITH THIS THE CURSOR WILL BEGIN IN THE UPPER LEFT HAND CORNER OF YOUR
SCREEN.

THE WAY TO OPEN THE 80 COLUMN-TEXTMODE,IS DONE EXACTLY AS WITH THE
TI99/4A WITH AN OPEN COMMAND.(SEE EXEMPLE).
SAMPLE PROGRAM:(ON DISK FILE NAME "TEST1"

WITH THE STATEMENT OPEN #1:"TEXT80",AND THE MONITOR IS SET FOR THE
80 COLUMN MODE.AND ALL NORMAL COMMANDS TO THE SCREEN LIKE CALL CHAR,
CALL CLEAR ...ARE ACTIVE BUT NOT VISUAL,UNTIL YOU CLOSE THE TEXT MODE
THEN YOU SEE THE RESULTS.

4.3.0 BY INPUT TAKE OVER SCREEN DISPLAY.

AFTER THE OPENING OF TEXT80 ALL LINES FOR AN INPUT ARE CLEARD
SHOULD THE LETTERS WHICH ARE ALREADY ON THE SCREEN TO BE DISPLAYED
WITH THE INPUT COMMAND.THIS CAN BE DONE WITH THE CONTROL CHARACTERS:
CHR$(27);CHR$(105)
TO RETURN TO THE BEGINNINGS VALUE THE CONTROL CHARACTERS ARE USED
CHR$(27);CHRR$(106)

5.0.0 PIN OUT FOR MONITOR :

THE 9-PIN SUB-D CONNECTOR IS USED FOR CONNECTING THE RGB MONITOR
TO THE 80 COLUMN EXPANSION.

PIN 1 GROUND
PIN 2 GROUND
PIN 3 R-SIGNAL (ANALOG)
PIN 4 G-SIGNAL (ANOLOG)
PIN 5 B-SIGNAL (ANALOG)
PIN 6 OPEN
PIN 7 + 5V
PIN 8 SYNCHRONISATION (TTL)
PIN 9 OPEN

5.1 COLOR DEFINITION:

THE TI 99/4A HAS 16 BASIC COLORS,WHICH CAN BE DISPLAYED ON THE SCREEN
THESE COLORS CAN BE FURTHER DEFINED .
THE DEFINED COLOR VALUES ARE IN THE COMPUTER ,UNTIL A HARDWARE
RESET APPEARS.YOU SHOULD BE CAREFULL WITH THE COLOR CHANGES,
OR,AS A RESULT YOU CAN HAVE A BLACK SCREEN AND YOUR
LETTERS ARE

THE DEFINITION OF THE COLORS ARE CALLED BY A FILE"DEFCOL",
IT IS A DISPLAY VARIABLE 80 FILE.
A SIMPLE WAY TO CHANGE COLORS IS TO : OPEN #1:"DEFCOL".

```
PRINT#1:"1777,7000"
```

1 DEFINES THE COLOR WHITE, AND 7 BLACK.
FOR EACH COLOR THERE IS A 7 DIGIT NUMBER.
THE FIRST DIGIT DESIGNATES THE COLOR (0-9 AND A-F)
PLEASE REMEMBER THAT YOU HAVE TO DEDUCT 1 FROM THE BASIC KNOWN
NUMBERS.
THE OTHER 3 DIGITS DETERMINE THE COLOR PARTS,STARTING WITH BLUE THEN
RED AND LAST GREEN.THE VALUES ARE RANGING FROM 0 TO 7.
0 GIVES YOU THE LEAST INTENSITY AND 7 IS THE MAXIMUM.
AFTER YOU HAVE FINISHED THE DEFINITION OF YOUR COLORS,YOU HAVE TO
CLOSE THE FILE AGAIN WITH CLOSE #1.
TO SEE ALL COLOR-SHADES POSSIBLE RUN EXEMPLE PROGRAM
"DEFCOL"

HAVE FUN WITH YOUR NEW TOY,AND GOOD LUCK...

SHOULD YOU COME UP WITH SUME NEW PROGRAMS FOR THE 80-COLUMN SYSTEM
PLEASE SHARE IT WITH US.
THANK YOU.

FOR THE 80-COLUMN SYSTEM AND SOFTWARE FOR IT CONTACT:

T.A.P.E. Ltd.
1439 SOLANO PL.
ONTARIO CALIF. 91764

(714)989-99906
AFTER 7PM MO-THU
FRI.SAT 8AM-7PM PACIFIC TIME

4.2.8. DEFINITION OF THE BLINK FREQUENCY

THE BLINK FREQUENCE CAN BE CHANGED FROM 0 SEC. TO 1 SEC.
THE CONTROL CHARACTER USED ARE FOLLOWING.
PRINT #1: CHR$(27);CHR$(102);CHR$(n)
THE FOLLOWING ARE SOME CLOSE VALUES:

NORMAL	BLINK
0 0.00 SEC	0 0.00 SEC.
16 0.16 SEC	1 0.16 SEC
32 0.33 SEC	2 0.33 SEC
48 0.5 SEC	3 0.5 SEC
64 0.67 SEC	4 0.67 SEC
80 0.83 SEC	5.0.83 SEC
96 1.00 SEC	6 1. SEC
112 1.17 SEC	7 1.17 SEC
128 1.34 SEC	8 1.34 SEC
160 1.67 SEC	10 1.67 SEC
176 1.84 SEC	11 1.84 SEC
192 2.00 SEC	12 2.00 SEC
208 2.17 SEC	13 2.17 SEC
224 2.34 SEC	14 2.34 SEC
240 2.5 SEC	15 2.5 SEC

IF YOU SELECT 0 FOR THE NORMAL DISPLAY,THAN YOU CAN MARK SRECIFIC FIELDS ON THE SCREEN

4.2.9. CHARACTER DEFINITION:

TO DEFINE A CHARACTER SIMILAR TO THE CALL CHAR COMAND IN BASIC LIKE IN BASIC,THIS IS DONE AS FOLLOWS:
PRINT#1:CHR$(27);CHR$(38);CHR$(0);CHR$(N);"DEFSTR$"
DEFSTR$ HAS THE SAME FORM AS IN BASIC CALL CHAR.
N IS GIVEN IN ASCII- VALUES FOR THE CHARACTER TO BE DEFINED.
TO GO BACK TO THE ORIGINAL DEFINATION OF THE CHARACTERS LIKE IN BASIC CALL CHARSET. YOU WILL USE CHR$(27);CHR$(38);CHR$(1)
NOW DEPENDING ON THE POSITION OF DIPSWITCH 2 ,SWITCH 3 SETTING TO LOAD THE ASCII (USA) OR THE GERMAN CHARACTER SET.
DEPENDING ON DIP-SWITCH 2 SWITCH 3
THE CHARACTER-SET HAS 255 CHARACTERS,AND IS UP TO CHARACTER 32 EQUAL TO THE TI-WRITER.

FOREGROUNDCOLOR	BACKGROUND-COLOR
0 TRANSPARENT	0 TRANPARENT
16 BLACK	1 BLACK
32 MEDIUM GREEN	2 MEDIUM GREEN
48 LIGHT GREEN	3 LIGHT GREEN
64 DARK BLUE	4 DARK BLUE
80 LIGHT BLUE	5 LIGHT BLUE
96 DARK RED	6 DARK RED
112 MEDIUM BLUE	7 MEDIUM BLUE
128 MEDIUM RED	8 MEDIUM RED
144 LIGHT RED	9 LIGHT RED
160 DARK YELLOW	10 DARK YELLOW
176 LIGHT YELLOW	11 LIGHT YELLOW
192 DARK GREEN	12 DARK GREEN
208 MAGENTA	13 MAGENTA
224 GRAY	14 GRAY
240 WHITE	15 WHITE

TO RECEIVE THE FULL VALUE OF n YOU HAVE TO ADD THE FOREGROUND-COLOR TO THE BACK-GROUND COLOR.

4.2.2. CURSOR IN THE UPPER LEFT HAND CORNER:
DURING WRITING TO THE SCREEN THE CURSOR CAN BE POSITIONED TO THE
UPPER LEFT HAND CORNER OF THE SCREEN WITH CHR$(19)
THIS COMMAND CAN BE GIVEN AT ANY TIME .

4.2.3. TURN ON BLINK ATTRIBUTE :

WITH THE CONTROL CHARACTER CHR$(18) THE BLINK-ATTRIBUTE IS TURNED
ON AND ALL CHARACTERS TYPED IN FROM THIS MOMENT WILL BE BLINKING

IN THE MIDST OF A SENTENCE YOU CAN TURN IT OFF WITH THE CONTROL
CHARACTER CHR$(20)

4.2.4. CLEARING OF THE BLINK-ATTRIBUTE :

BLINKING CHARACTERS ON THE SCREEN, WILL STAY SO UNTIL
A SCREEN SCROLL OR A CLOSE STATEMENT IS ISSUED.
WITH THE FOLLOWING CHARACTERS YOU CAN ERASE THE BLINKING OF THE
CURSOR:
CHR$(27);CHR$(101)
AND NONE OF CHARACTERS ON THE SCREEN WILL BE BLINKING
SAMPLE PROGRAM ON DISK "TEST2"

4.2.5. CURSOR POSITIONS.

THROUGH THE CONTROL CHARACTERS CHR$(27);CHR$(98);CHR$(n);CHR$(m)
YOU CAN PLACE THE CURSOR AT ANY SPOT ON THE SCREEN YOU LIKE TO
THE VALUE n IS DESIGNATED FOR THE ROW (0 TO 25)
THE VALUE m IS DESIGNATED FOR THE COLUMN (0 TO 79)
THE CONTROL SEQUENCE IS:
CHR$(27);CHR$(98);CHR$(8);CHR$(40)
THIS POSITIONS THE CURSOR IN THE
9 TH ROW AND IN THE 41ST COLUMN FROM THE TOP.

4.2.6 INPUT LENGTH DEFINITION:

USUALY AN INPUT-LINE IS CONSIDRED FROM THE CURSOR
POSITION TO THE END OF THE SCREEN. THE INPUT CHARACTER LENGTH
CAN BE DETERMENED BY THE FOLLOWING CONTROL CHARACTERS:
CHR$(29);CHR$(112)CHR$(n)
n IS THE LENGTH OF THE INPUT CHARACTER,AND CAN ONLY
BE 0 TO 79 CHARACTERS (NEVER OVER THE SCREEN OR LONGER THAN 80).

IMPORTANT:

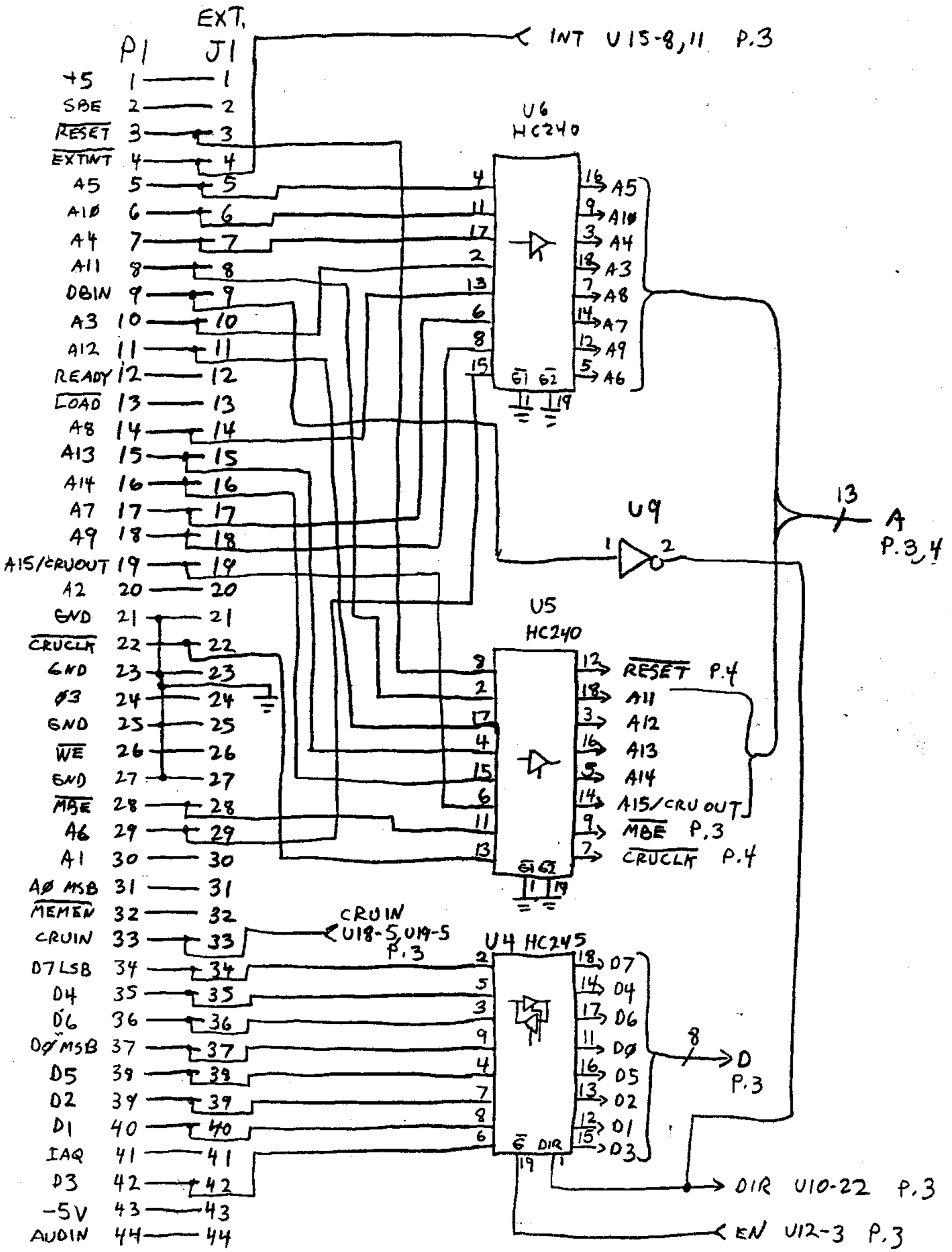
IF A CHARACTER INPUT IS DEFINED FOR 12 COLUMNS THIS CAN
ONLY BE CHANGED WITH THE CONTROL-CHARACTER:
CHR$(27);CHR$(112);CHR$(80) BACK TO 80 COLUMN

4.2.7. COLOR DEFINITION:

NORMALLY THE COLORS ARE SET BLACK BACKGROUND AND WHITE CHARACTERS.THE
COLORS CAN BE CHANGED TO YOUR LIKINGS.
CONTROL CHARACTERS: CHR$(27);CHR$(99);CHR$(n);CHR$(m)
n IS THE DEFINITION OF THE NORMAL COLORS
m IS THE DEFINITION OF THE BLINKER.

CONSOLE EXT.

P1 J1



MECHATRONICS 80 COL CARD

P.1 G. BISHOP ~~3-5-90~~ 3-6-90

FCN	P6 U100 SOCKET	P5 CABLE
$\overline{RAS}$	1	1
$\overline{CAS}$	2	2
AØ D7	3	3
A1 D6	4	4
A2 D5	5	5
A3 D4	6	6
A4 D3	7	7
A5 D2	8	8
A6 D1	9	9
DØ	10	10
$\overline{R/W}$	11	11
VSS	12	12
MODE	13	13
$\overline{CSW}$	14	14
$\overline{CSR}$	15	15
$\overline{INT}$	16	16
CD7	17	17
CD6	18	18
CD5	19	19
CD4	20	20
CD3	21	21
CD2	22	22
CD1	23	23
CDØ	24	24
RD7	25	25
RD6	26	26
RD5	27	27
RD4	28	29
RD3	29	29
RD2	30	30
RD1	31	31
RDØ	32	32
VCC	33	33
-RST9918	34	34
NC	35	35
VIDOUT	36	36
GROMCLK	37	37
CPUCLK	38	38
COMPVID	39	39
COMPVID	40	40

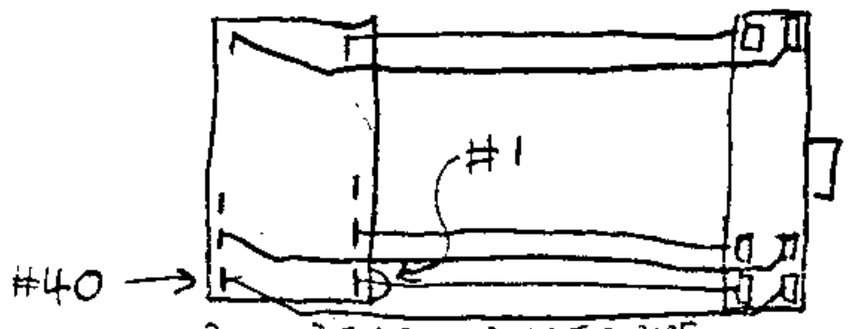
J5

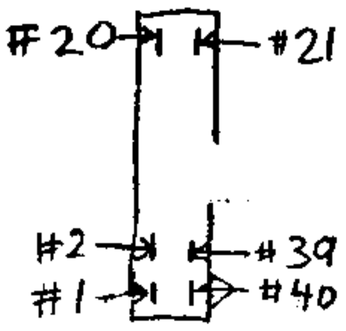
1	R16 3.3K → +5	
2	R15 3.3K → +5	
3	NC	
4		
5		
6		
7		
8		
9		
10		
11		
12	NC	
13		MODE1
14		MODEØ
15		$\overline{CSW}$
16		$\overline{CSR}$
17	25	$\overline{INT}$
18	40	CDØ
19	39	CD1
20	38	CD2
21	37	CD3
22	36	CD4
23	35	CD5
24	34	CD6
25	32	CD7
26	NC	
27		
28		
29		
30		
31		
32		
33	NC	
34		9 $\overline{RESET}$
35	NC	
36	NC	
37		GROMCLK
38	NC	
39	NC	
40	NC	

+5 → R14 3.3K → NC 28

PART OF U3 9938

GROMCLK U7-11 P.4





MECHATRONICS 80
COL CARD P.2
G. BISHOP ~~3-5-90~~
3-6-90

U10
27128

P.4 U16-5 > A13
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15/CRUOUT
A
P.1

P.1 DIR U4-9 > G
E
GND

VCC → +5V
PGM → +5V
VPP → +5V

D8 D7 D6 D5 D4 D3 D2 D1
D Ø MSB
D 1
D2
D3
D4
D5
D6
D7 LSB
D
P.1

RP1
+5V
S1
10K

U18
HC251
D7 D6 D5 D4 D3 D2 D1 DØ
W NC
Y → P1/J1-33 CRUIN P.1
A14 A13 A12 A SEL
A P.1
G

RP2
+5V
S2
10K

U19
HC251
DØ D3 D2 D3 D4 D5 D6 D7
W NC
Y

S4 S5

A14 A13 A12 A SEL
A P.1
U15 HC125

P.4 U16-4 > U9 MBE
P.1 MBE
EN U4-19 P.1

P.4 U16-9 > INT EN
U9

P.4 U16-7 > S1/S2 SEL
U9 HC04
HC00 U12

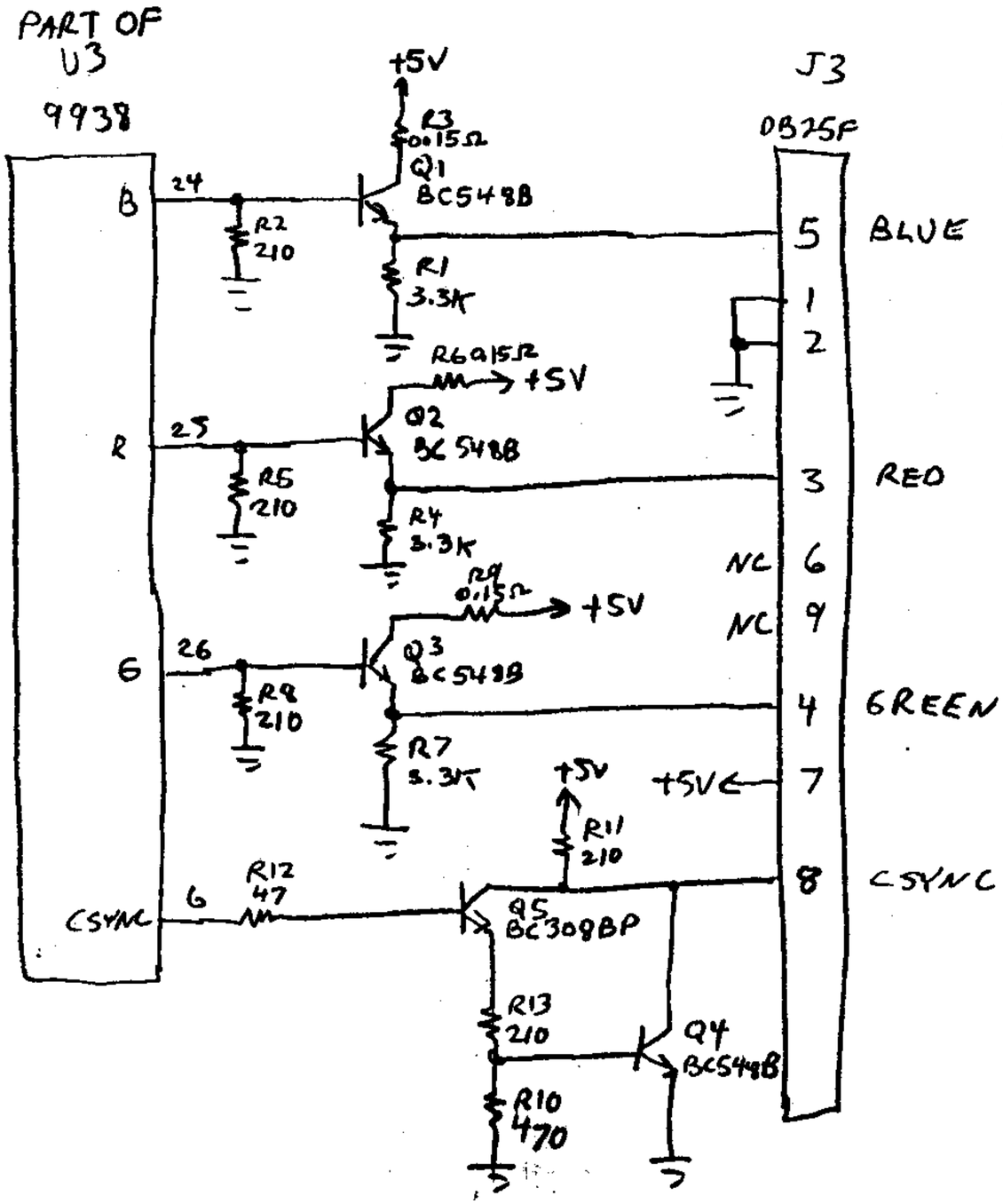
P.4 U13-6 > SW EN
U12 HC00

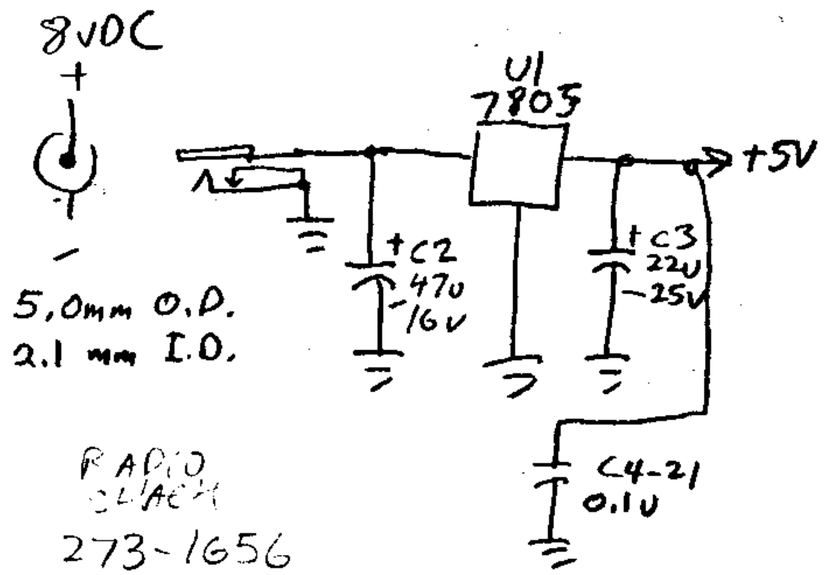
INT P1/J1-4 P.1
U15 HC125

MECHATRONICS 80 COL CARD
P.3 6. BISHOP ~~3-5-90~~
3-6-90

MECHATRONICS 80 COL CARD
P.4 G. BISHOP ~~3-5-90~~
3-6-90

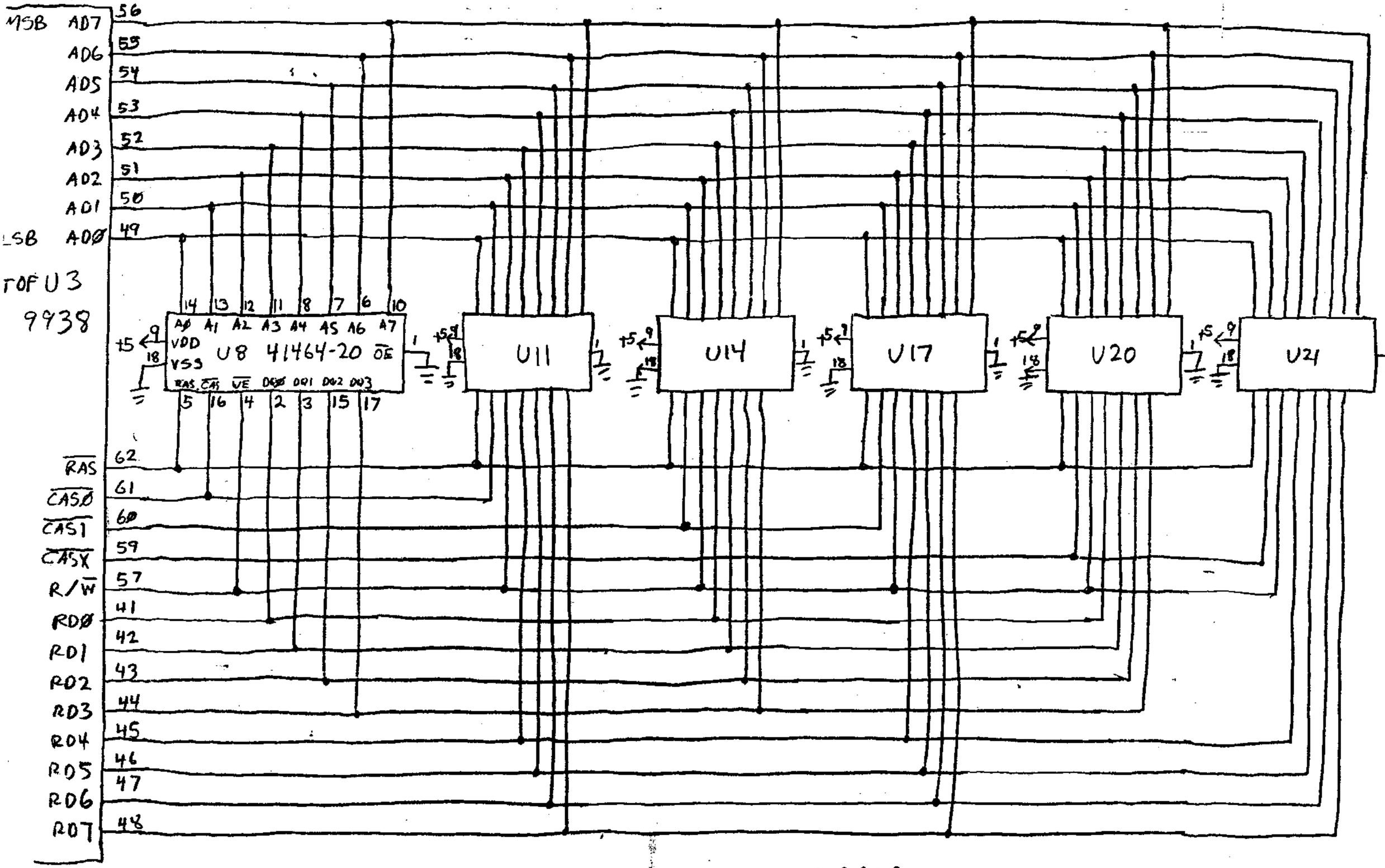
CRU SEL
S3
+5V +5V +5V +5V
R17 3.3K R18 R19 R20
U13
HC85
B3 B2 B1 B0
A>B A=B A<B
NC NC
SW EN
U12-9,12
P.3
A3 A4 A5 A6 A7
A
P.1
9938
PART OF U3
Y1
21.47727 MH2
XTAL1 XTAL2 GND GND PAC VBB VCC CPUCLK DHCLK DLCLK VDS HSYNC BLEO VS VIDEO C7 C6 C5 C4 C3 C2 C1 C0 CBDIR
P.4 U15-3 LPS
P.4 U15-6 LDS
NC
+5V
U7
LS93
QB QC QD QA
NC NC
JS-37 GROMCLK P.2
+5V
+5
GND
U2
HC245
DIR
J4
U9
CRUCLK U5-7 P.1
U12
U16
HC259
A14 A13 A12 A6
A
P.1
S0 S1 S2 G D CLR
QA QB QC QD QE QF QG QH
U12-1 P.3
U10-26 P.3
S1/S2SEL U9-9
INTEN U9-11
RESET U5-12 P.1
U9
P.4 LPS U3-26
LPD U3-27 P.4
U15 HC125
C1 1U 23V
#8 #1 #9 #16
LOOKING INTO J4



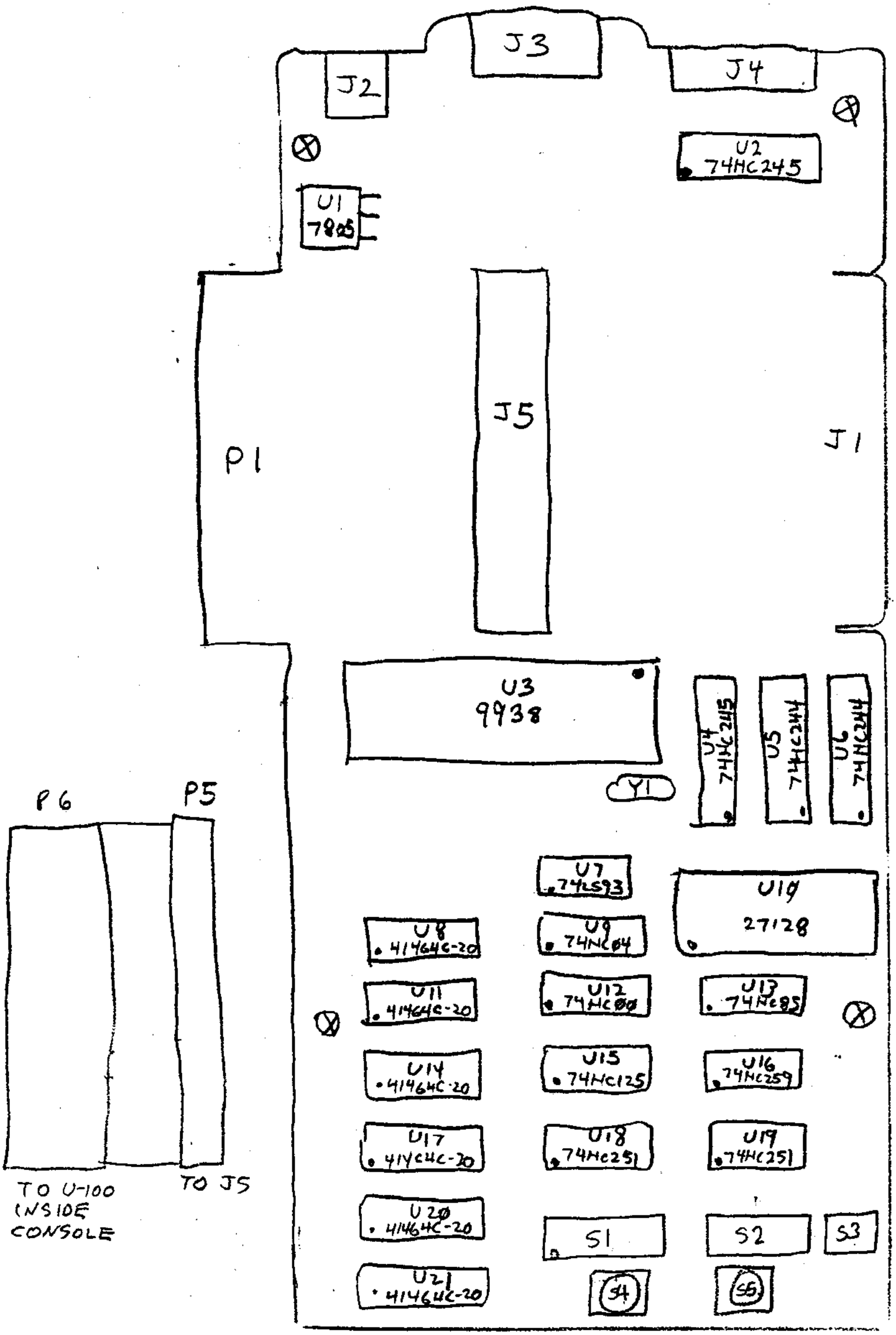


MECHATRONICS 80 COL
P.5 G. BISHOP ~~3-5-90~~
3-6-90

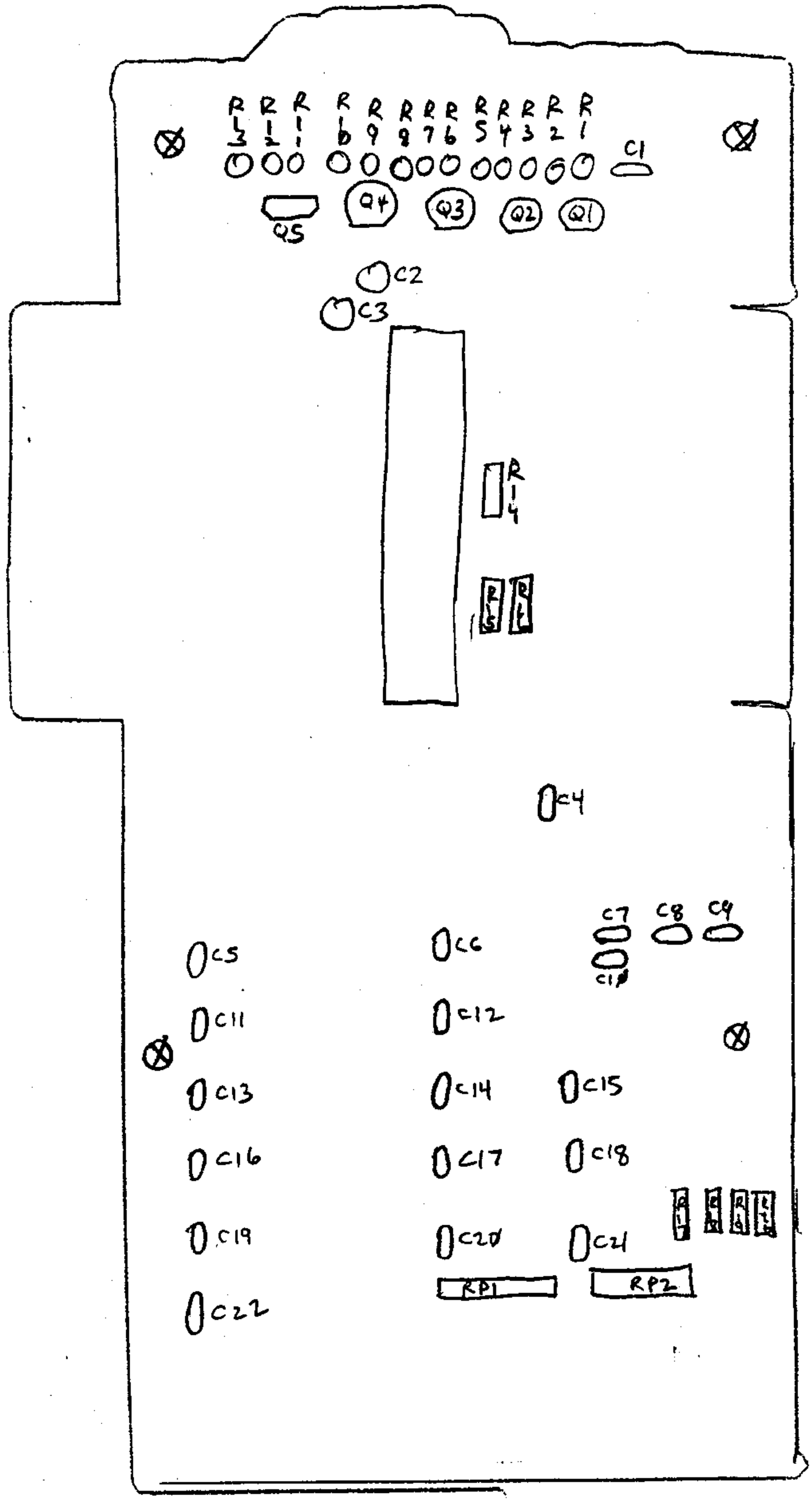
MECHATRONICS 80 COLUMN CARD - RAM CONNECTIONS P. 6



G. BISHOP
10-9-89



MECHATRONICS 80 COLCARD P. 8 S. BISHOP ~~3-5-90~~
3-6-90



MECHATRONICS 80 COL CARD P.7 G. BISHOP 3-5-90