DOC. NO. : RT17B-PG-012
REV. : 0
DATE : 5 Oct., 95

GENERAL PRODUCT SPECIFICATIONS FOR MONTREUX

A **Adapter** requirement : DC 5.6±0.1V Regulated.

B **Current** consumption :
a) Normal mode at adapter = 5.6V
300mA typical
500mA max.

b) Memory mode at battery terminal = 3.0V
3µA typical
6µA max.

C Power consumption : 2.8W typical
5.6W max

D System clock frequency : 28.322MHz ±1% (adapter = 5.6V)

E Real time clock frequency : 32768Hz ±0.1% (adapter = 5.6V)

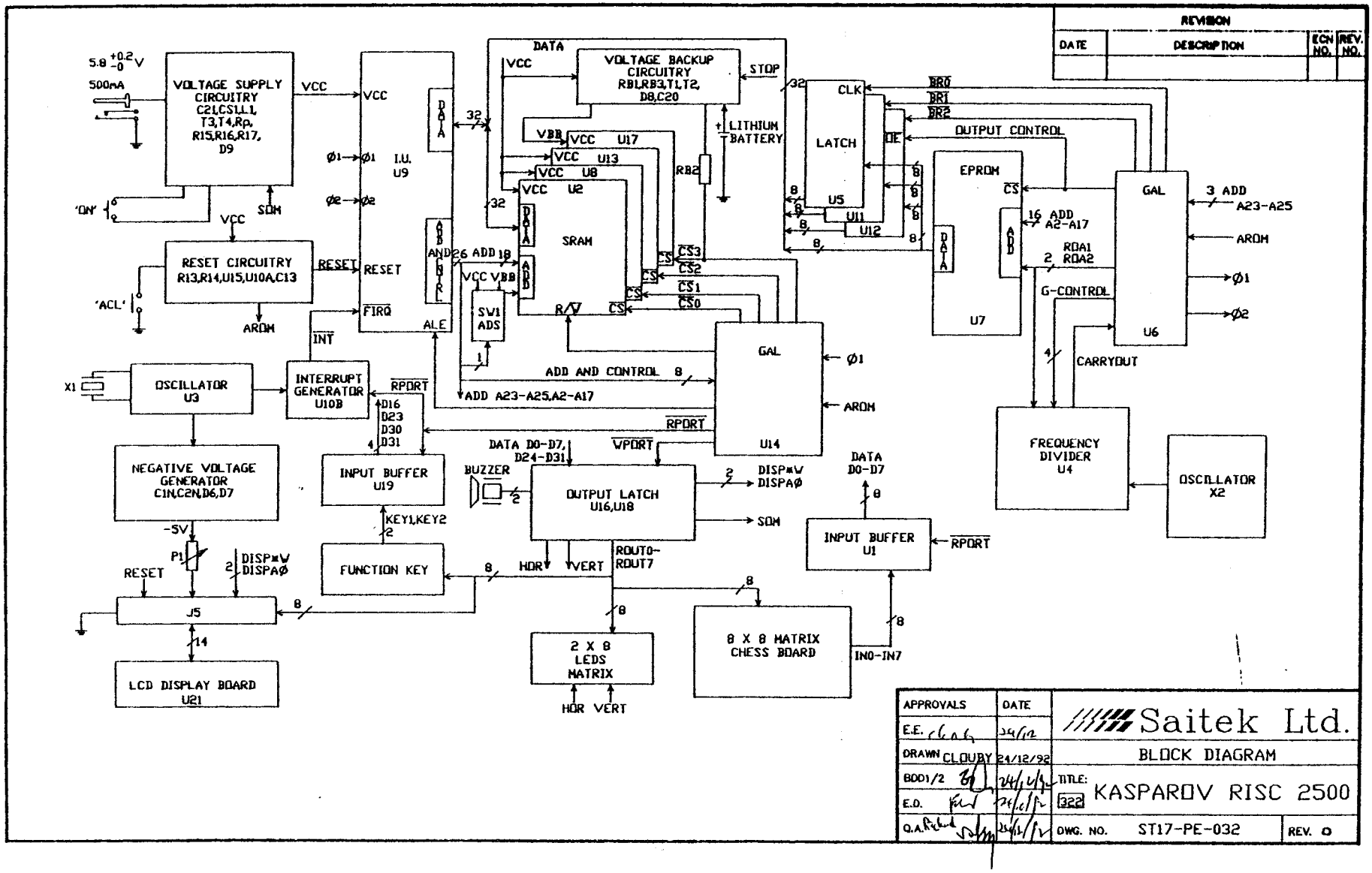
PREPARED BY : Daniel
Daniel Fong

APPROVED BY : Z Q

DIST : BDM, QAM, SEE, SEA, IEM

Filename : /BDD1/RT17B-PS.Doc

ORIGINAL



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RT17B-PS-011
0
5 Oct., 1995

MONTREUX ADJUSTMENT PROCEDURE

Object : To adjust system clock frequency.

Equipment needed : Frequency counter or Oscilloscope capable of frequency measurement up to 30MHz.

Procedure

1. Disassemble unit by removing screws (6) on bottom cover.
2. Power on unit (Adapter = 5.6V)
3. Place probe of counter/scope at pin 1 of X2.
   If frequency measured is out of specified range (28.04-28.60MHz or the crystal marked value +/-1%), replace X2 until counter/scope reading is within specification.
4. Reassemble unit.

Object : To adjust real time clock frequency.

Equipment needed : Frequency counter or Oscilloscope capable of frequency measurement up to 1MHz.

Procedure

1. Disassemble unit by removing screws (6) on bottom cover.
2. Power on unit (Adapter = 5.6V)
3. Place probe of counter/scope at pin 11 of U3.
   If frequency measured is out of specified range (32736-32800Hz, replace CX1 or X1 until counter/scope reading is within specification.
4. Reassemble unit.

Prepared by : Daniel
Daniel Fong

Approved by : [redacted]

Dist : [redacted] SEE, SEA

Filename : /BDD1/RT17B-PS.Doc

Montreux Trouble Shooting Chart

SYMPTOMS		POSSIBLE CAUSES
Unit does not function	1.	Check if only adapter provided by Saitek for the Montreux is used.
	2.	Check if adapter output voltage is between 5.5-5.7V.
	3.	Check voltage supply to all I.C. (except U17) is 5.3±0.3V.
	4.	Check voltage at U17 is 5.1±0.3V.
	5.	Check if jumper setting is correct.
	6.	Look for no broken wire connections.
	7.	Check if X2 is oscillating at 28.322MHz±1%.
	8.	Check if X1 is oscillating at 32768Hz±0.1%.
	9.	Check if 'ACL' switch (SW1) is not short to GND.
	10.	Check if all the I.C. are functionally good.
LCD malfunction	1.	Look for no broken wire connections.
	2.	Check if the negative voltage supply to LCD driver chip is between -3.6 to -5.3Volt.
	3.	Check if heat seal connector to LCD is intact.
	4.	Check if LCD driver chip is functionally good.
	5.	Check if U18 is functionally good.
Do not retain game	1.	Check for Lithium battery voltage is not lower than 2.7V.
	2.	Check if T1, T2, D8, C20 are functionally good.
	3.	Check if U1 & U17 are functionally good.
	4.	Check if jumper SW1 and ADS setting are correct.
Improper response to chessboard or function key	1.	Check for no dust or oxide on sensor and keys.
	2.	Check for no broken wire connection.
	3.	Check if U18, U1, U19 are functionally good.
LED malfunction	1.	Look for broken trace(s) on PCB.
	2.	Look for short circuit on PCB.
	3.	Check if U16 and U18 are functionally good.
No sound	1.	Look for broken wire connection.
	2.	Check if U6 and buzzer are functionally good.
Unit does not turn ON	1.	Check if T3, T4 are functionally good.
	2.	Look for no broken wire connection.
Unit does not turn OFF	1.	Check if STOP switch is functionally good.
	2.	Check if U16 is functionally good.

Dist : BDM, QAM

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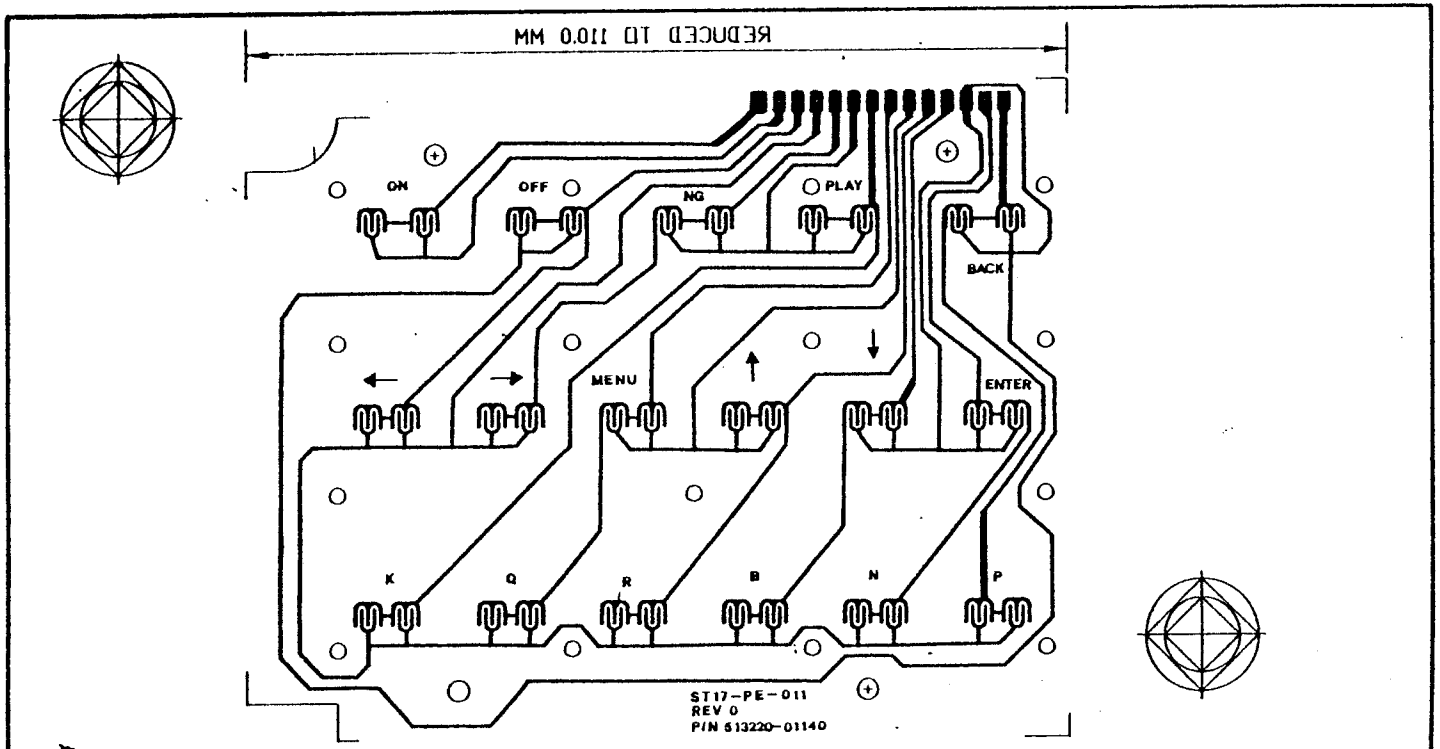

3RD ANGLE PROJECTION	SIGNATURE		DATE
TOLERANCES	DRAWN BY:	TS	4-5-94
DIM. : ANGLE:	CHECK BY:	BR	22-5-94
SCALE: 2:1 UNIT: mm	ENGRG AUTH	[illegible]	22-5-94
QUANTITY :	Q.A. APPD.	[illegible]	25-5-94
SHEET OF	BOD APPD.		

REV.	ITEM	WAS / DESCRIPTION OF CHANGE	IS	DATE	DRAWN	CHECK	ED	QA	BOD APPROVED

Saitek

TITLE: Key PCB Layout - Solder Side -

DWG. NO.: ST17-PE-01155 PROJECT: ST17

P/N : 513220-01140

MATERIAL FINISH

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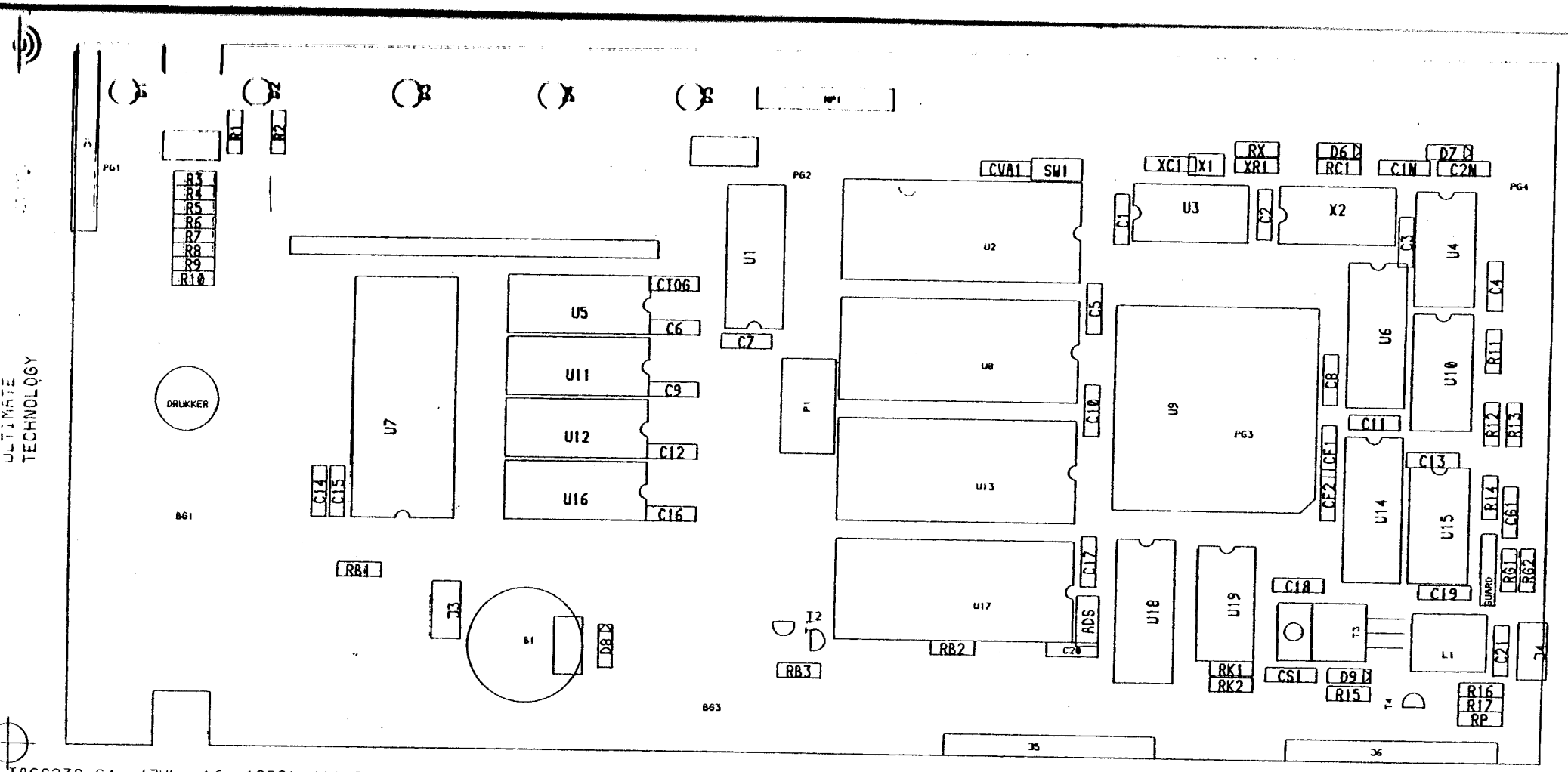
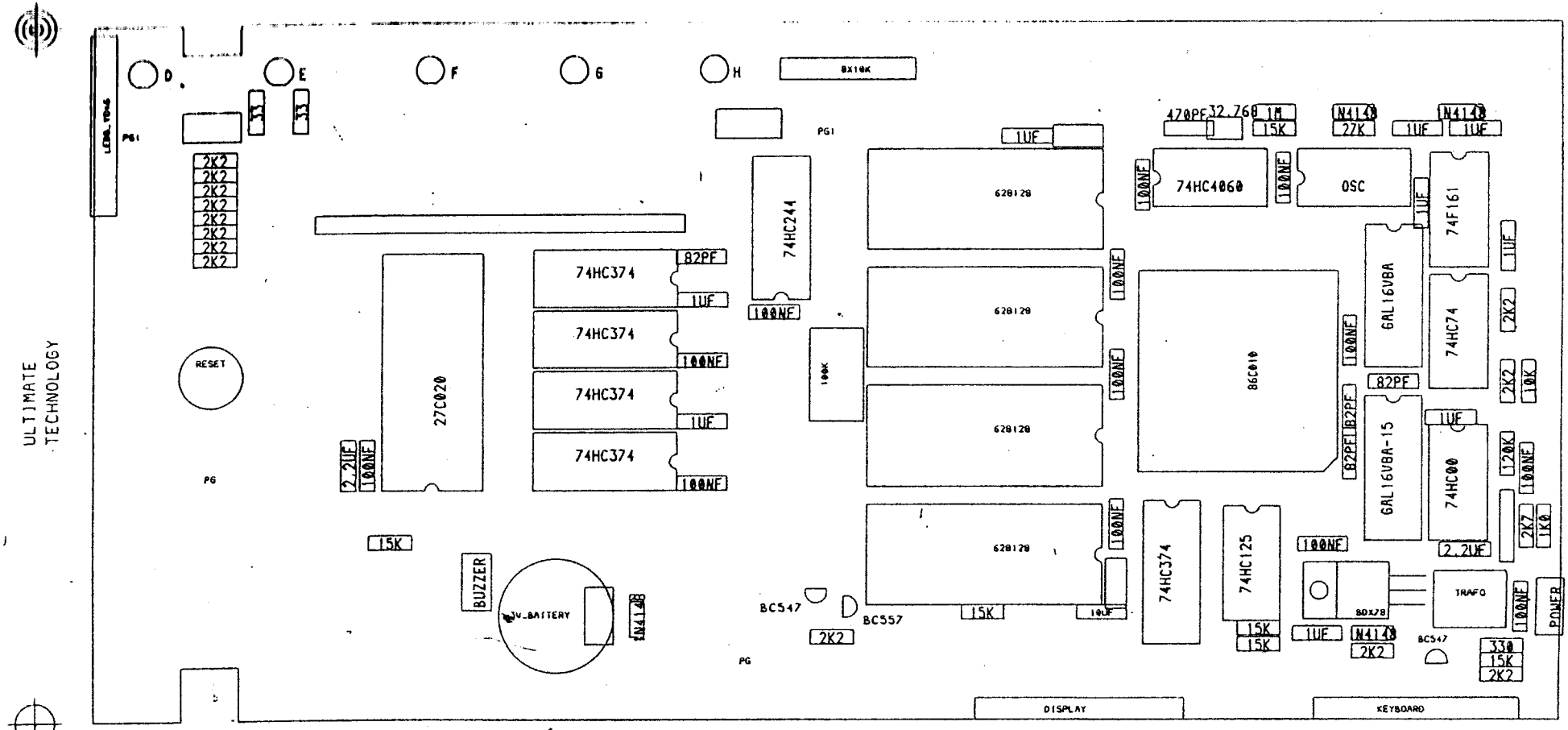


TASC23C.G4 (JUL. 16. 1992) (11:04) (TASC) SCALE: 100%
DRILL REF PNT: 0.635, 123.190 (MM)

ULTIMATE TECHNOLOGY



TASC23C.G3 (JUL. 16, 1992) (11:04) (TASC) SCALE: 100%
DRILL REF PNT: 0.635, 123.190 (MM)

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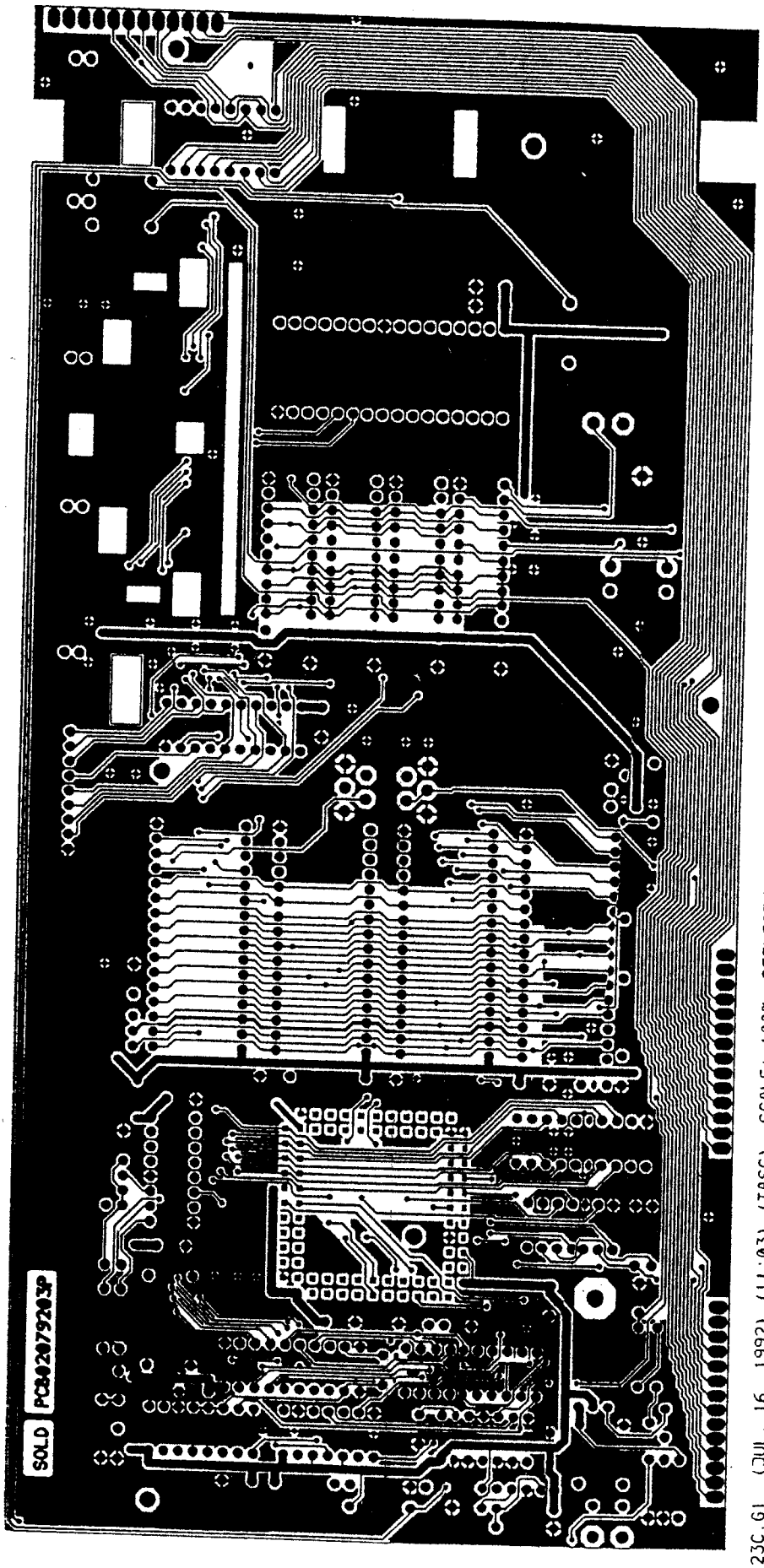


TASC23C.GI (JUL. 16, 1992) (11:03) (TASC) SCALE: 100% REFLECTED
DRILL REF PNT: 0.635, 123.190 (MM)

ULTIMATE
TECHNOLOGY

RT17B P. 1/57

ULTIMATE
TECHNOLOGY

TASC23C.GO (JUL. 16, 1992) (11:02) (TASC) SCALE: 100%
DRILL REF PNT: 0.000, 0.000 (MM)

RT 7B P. 11/57

SAITEK

BILL OF MATERIALS

PROJECT : RT17B (Montreux)

ART.NO. : 462

REVISION : 1

REVISION HISTORY

REVISION	DATE	BY	DESCRIPTION OF CHANGES
P1	24.02.95	Leon Wong	New release (BoM based on ST17).
1	19.05.95	Leon Wong	Revise EPROM to ATMEL brand; change DC jack inlay; change key top color to black; revise part nos. for giftbox and manual.

RELATED DOCUMENTS REV

Schematic dwg : ST17

Prepared By : Leon Wong

Approved by : BDM1

Distribution :
[x] MMM,FAM,IEM, SEE, SEC, SEM; QAM
[ ] MMM,FAM,IEM SEE; QAM
[ ] MMM,IEM

Date : 23 MAY 1995

[illegible] component; * =desc/PN/Ref changed +/-=cost up/down; C/NC=consigned/non-consigned; +/-Q=QTY up/down

- RT178, MONTREUX Rev : 1

Seq	Qty	Stock Code	Rev	Cons	Description	Qty Per Reference
		934620-00000	1		UNIT ASSEMBLY,FOR RT178	1.000
		914620-00001	1		GUTS ASSEMBLY - LOGIC,RT178	1.000
		513220-01511			PCB,LOGIC,D-SIDED,1.6MM,FR4	1.000
		860902-40000		RC	MICROPROCESSOR,FOR ST17 (ARM60)	1.000
		513220-03570		RC	PCB,CONVERT ARM60 TO ARM2 MICROPROCESSOR	1.000 RUNNING CHANGE
		513220-03571			PCB,CONVERT ARM60 TO ARM2 MICROPROCESSOR	.000
		870013-216V8		RC	PAL,16V8-15 AMD FOR ST17 (ARM60) U6	1.000 U6
		000140-20254		RC	IC SOCKET,DIP,20PINS,P=2.54MM	2.000 FOR U6.U14
		832080-00256		RC	SRAM,628256,32KX8,80NS,DIP28	4.000 U2,U8,U13,U17
		870014-216V8		RC	PAL,16V8-15 AMD FOR ST17 (ARM60) U14	1.000 U14
		842150-TMS20		RC	EPROM,BLANK,TMS27C020,256KX8 CMOS,150NS	1.000 U7
		740603-00000		RC	TTL,-00,QUAD 2-INPUT NAND GATES,HC	1.000 U15
		741233-00374		RC	TTL,-374,OCTAL D-TYPE FLIP-FLOP,HC	5.000 U5,11,12,16,18
		741243-00244		RC	TTL,-244,LINE DRIVER/BUFFER,HC	1.000 U1
		741253-04060		RC	TTL,-4060,14-STAGE BINARY COUNTER,HC	1.000 U3
		741263-00074		RC	TTL,-74,DUAL D-TYPE FLIP-FLOP,HC	1.000 U10
		741274-00161		RC	TTL,-161,SYNC,BINARY COUNTER,F	1.000 U4
		741295-00125		RC	TTL,-125,QUAD BUS BUFFER,3 STATE,HCT	1.000 U19
		843276-80120		RC	CRYSTAL,32.768KHZ,20PPM	1.000 X1
		842832-23150		RC	CRYSTAL OSCILLATOR,28.322MHZ,50PPM	1.000 X2
		870255-7C800		RC	TRANSISTOR,PNP,BC557,C,CENTRE B	1.000 Q2
		870154-7C800		RC	TRANSISTOR,NPN,BC547,C,CENTER B	2.000 Q1,Q4
		871180-91200		RC	TRANSISTOR,PNP,BD912,C,CENTRE B	1.000 Q3
		800260-00005		RC	BATTERY,LITHIUM 2032,3.0V,WITH S.LEADS	1.000 B1
		836200-00020		RC	JUMPER SELECTOR SET,3 CKT	2.000
		854148-10000			DIODE,SWITCHING,1N4148	5.000 D6-D9,D10 ONU15
		850005-12205		RC	LED,RED,RECT,2X5MM,TOSHIBA,TLR208	5.000 D1-D5
		830003-10000		RC	INDUCTOR,TOROID,16T	1.000 T1
		811025-31102			RESISTOR,FIXED C-FILM,1K,5%,1/4W	3.000 R11,R15,RP
		811015-31102			RESISTOR,FIXED C-FILM,100,5%,1/4W	2.000 R1,R2
		811615-31102			RESISTOR,FIXED C-FILM,680,5%,1/4W	1.000 R12
		812225-31102			RESISTOR,FIXED C-FILM,2K2,5%,1/4W	8.000 R3-R10
		812225-31102			RESISTOR,FIXED C-FILM,2K2,5%,1/4W	1.000 R83
		811035-31102			RESISTOR,FIXED C-FILM,10K,5%,1/4W	2.000 R13,RG1
		811245-31102			RESISTOR,FIXED C-FILM,120K,5%,1/4W	1.000 R14
		811315-31102			RESISTOR,FIXED C-FILM,330,5%,1/4W	1.000 R16
		811535-31102			RESISTOR,FIXED C-FILM,15K,5%,1/4W	3.000 R17,R81,R82
		811535-31102			RESISTOR,FIXED C-FILM,15K,5%,1/4W	3.000 RK1,RK2,XR1
		816825-31102			RESISTOR,FIXED C-FILM,6K8,5%,1/4W	1.000 RC1
		811835-32109		RC	RESISTOR,ARRAY C-FILM,10KX8,5%,1/4W,9	1.000 RP1
		811965-31102			RESISTOR,FIXED C-FILM,10M,5%,1/4W	1.000 RX
		800230-00001		RC	SLIDE VOLUME,50KB,RS10F121A	1.000 P1
		821048-0161X			CAPACITOR,MONO,0.1UF,+/-20%,16V(+80-20%)	5.000 C1,C2,C5,C7,C8
		821048-0161X			CAPACITOR,MONO,0.1UF,+/-20%,16V(+80-20%)	6.000 C9,C10,C15-C18
		821048-0161X			CAPACITOR,MONO,0.1UF,+/-20%,16V(+80-20%)	2.000 C21,C13
		821058-01612			CAPACITOR,TAN-CAP,1UF,+/-20%,16V	4.000 C1N,C2N,C3,C4
		821058-01612			CAPACITOR,TAN-CAP,1UF,+/-20%,16V	3.000 C6,C12,CS1
		822115-05014			CAPACITOR,C-CAP NPO,220PF,+/-5%,50V	1.000 CF1
		824715-05014			CAPACITOR,C-CAP NPO,470PF,+/-5%,50V	1.000 C28 ADD ON U14
		821058-01612			CAPACITOR,TAN-CAP,1UF,+/-20%,16V	1.000 CVA1

RT178 R. 3/

- RT17B, MONTREUX Rev : 1

Dg	Stock Code	Rev	Cons	Description	Qty Per	Reference
	62225M-01612			CAPACITOR,TAN-CAP,2.2UF,+/-20%,16V	2.000	C14,C19
	62820K-01614			CAPACITOR,C-CAP,NP0,82PF,+/-10%,16V	2.000	C11,CF2
	62330J-05014			CAPACITOR,C-CAP,NP0,33PF,+/-5%,50V	1.000	C22 ON U2
	62101M-01611			CAPACITOR,C-CAP,100PF,+/-20%,16V	1.000	CTOG
	62106Z-01616			CAPACITOR,E-CAP,10UF,+80-20%,16V,L.L	1.000	C20
	62151M-01611			CAPACITOR,C-CAP,150PF,+/-20%,16V	2.000	C26-27 ON U14
	62471M-01611			CAPACITOR,C-CAP,470PF,+/-20%,16V	1.000	XC1
	62105K-01012			CAPACITOR,TAN-CAP,1UF,+10%,10V	3.000	C23-25 MCU PCB
	67032S-01623		RC	TRANSISTOR,NPN,2SC1623-L7,CHIP TYPE	1.000	Q5 ON MCU PCB
	611035-A4102			RESISTOR,CHIP,C-FILM,10K,5%,1/10W	1.000	R18 ON MCU PCB
	613315-A1102			RESISTOR,CHIP,C-FILM,330,5%,1/10W	1.000	R19 ON MCU PCB
	000010-00100			ACL,RESET CONTACT,D=10MM,CR STEEL	1.000	
	000140-32254			IC SOCKET,DIP,32PINS,P=2.54MM	5.000	FOR RAM & EPROM
	000110-00040			NUT,M2.6XP0.45X1.6MM,MILD STEEL	1.000	FOR Q3 (T3)
	000071-20424			SCREW,M/S,+PAN,M2.6XP0.45X6MM,FLAT	1.000	FOR Q3 (T3)
	000030-01220			CONN ARRAY,N=11,L=20MM,P=2.54MM,E=11MM	4.000	FOR MCU PCB
	000030-01230			CONN ARRAY,N=10,L=20MM,P=2.54MM,E=11MM	4.000	FOR MCU PCB
	61A103-00002	1		GUTS ASSEMBLY - LED	1.000	
	614103-02520			PCB,LED,S.S,1.6MM,PAPER PHENOLIC	1.000	
	000065-12205		RC	LED,RED,RECT,2X5MM,TOSHIBA,TLR208	11.000	LED1-8,A-C
	000130-00150			CONN ARRAY,N=12,L=17MM,P=2.54MM,E=3.5MM	1.000	
	61E220-00003	1		GUTS ASSEMBLY,LCD,FOR ST17	1.000	
	61E220-00730	1		MODULE,MICROPROCESSOR ON PCB,FOR ST17	1.000	
	614220-01231			PCB, LCD.DS.1.6MM,FR4	1.000	
	650021-01520		RC	IC,LCD DRIVER,SED1520,DIE FORM	1.000	U21
	612220-00730C			BONDING CHARGE FOR ST17 LCD DIE	1.000	
	611535-31102			RESISTOR,FIXED C-FILM,15K,5%,1/4W	5.000	R8-R12
	621041-01611			CAPACITOR,C-CAP,0.1UF,+80-20%,16V	6.000	C8-C13
	611455-31102			RESISTOR,FIXED C-FILM,1M4,5%,1/4W	1.000	R13
	000035-01100			CONN ARRAY,N=14,L=50MM,P=2.54MM,E=3.5MM	1.000	
	61S220-00004	1		GUTS ASSEMBLY - COMMAND,FOR ST17	1.000	
	61S220-01140			PCB,COMMAND,1.6MM PAPER PHENOLIC	1.000	
	25S710-01000		RC	RUBBER,CONDUCTIVE RUBBER,GREY,ST8	1.000	
	000135-00950			CONN.ARRAY,N=14,L=30MM,P=2.54,E=3.5MM	1.000	
	61S220-00005	1		GUTS ASSEMBLY - RFI,FOR ST17	1.000	
	61S210-02150			PCB,RFI,S.S,1.6MM PAPER PHENOLIC	1.000	
	630063-10000		RC	INDUCTOR,TOROID,16T	1.000	
	000151-25155			JUMPER,L=12.5MM,LL=15MM,D=0.5MM	2.000	
	000229-00002			SOCKET,DC POWER JACK,TC 18-014	1.000	
	000062-22043			STRAND WIRE,RED,L=220MM,E=3.5MM,AWG28	1.000	
	000063-22043			STRAND WIRE,BLACK,L=220MM,E=3.5MM,AWG28	1.000	
	61A620-00000	1		CASING ASSEMBLY,FOR RT17B	1.000	
	62S710-05201		RC	SENSOR,CHESSBOARD,COMBO ST8,AG	1.000	
	624620-06500		RC	OVERLAY,FOR RT17B,CHESSBOARD,COMBO,LEXAN	1.000	

- RT178, MONTREUX Rev : 1

Item	Dg	Stock Code	Rev	Cons	Description	Qty Per Reference
37		220000-00605		RC	METAL,PLATE,191.2X191.2,W/D-TAPE,ST8	1.000
38		354620-00300		RC	INLAY,FOR LCD,PVC,GOLDEN S.SCREEN,RT178	1.000
39		354620-00100		RC	INLAY,FOR TOP CAB,PVC,GOLDEN S.SCN,RT178	1.000
40		344620-00200		RC	NAME PLATE,AL,ARM6 RISC,SILKSCREEN,RT178	1.000
41	*	354620-00800		RC	INLAY,FOR JACK,LEXAN,GOLD,RT178	1.000
42		333220-00310		RC	LCD,FOR ST17	1.000
43		292720-03000		RC	DOUBLE SIDED TAPE,FOR ST12 LCD LENS	1.000
44		000090-00210		RC	FOAM PAD,FOR ST12,52X24.8X2.7MM	1.000
45		000931-00930		RC	CONN,HEAT SEAL,JS,N=70,L=30MM,P=0.68	1.000
46		330000-00150		RC	RUBBER ROD,48X2.9X2.8MM,COMPRESS KE951U	1.000
47		215120-02502		RC	PLASTIC,SENSOR CLAMP LARGE,PC,CLEAR	1.000
48		214210-03500		RC	PLASTIC,LOCK PIN,NYLON 66,WHITE	1.000
49		214103-06000		RC	PLASTIC,ACL SW.PIN,HIPS,BLACK	1.000
50		000130-00270			BUZZER,D=27MM	1.000
51		000021-00010			RUBBER FOOT,3M,D12X3.2MM,ADHESIVE	4.000
52		000101-01003			SPONGE,10X10X3MM	1.000 FOR ACL
53		000090-00251			FOAM PAD,80X20X4.0MM,ADHESIVE,ST17-PM-29	1.000 FOR SRAM
54		000090-00260			FOAM PAD,20X15X2.5MM,ADHESIVE,ST17-PM-30	1.000 FOR EPROM
55		354103-06700		RC	INLAY,FOR LCD CONTRAST(DIM),PVC,YO1GA	1.000
56		354103-06800		RC	INLAY,FOR LCD CONTRAST(BRIGHT),PVC,YO1GA	1.000
57		000068-18043			STRAND WIRE,GREY,L=180MM,E=3.5MM,AWG28	2.000 FOR BUZZER
58		000073-21544			SCREW,S/T,+PAN,M3.0X10MM,A	6.000 FOR CABINET
59		000073-21424			SCREW,S/T,+PAN,M2.6X6MM,A	4.000 FOR LCD PCB
60		000073-21434			SCREW,S/T,+PAN,M2.6X8MM,A	4.000 FOR KEY BOARD
61		000073-21434			SCREW,S/T,+PAN,M2.6X8MM,A	2.000 FOR LOGIC PCB
62		000073-21434			SCREW,S/T,+PAN,M2.6X8MM,A	2.000 FOR PANEL
63		354620-00000	1		CABINET SET,FOR RT178	1.000
64		215710-00119		RC	PLASTIC,T.CAB,HIPS,SPY.BLACK	1.000
65		215710-00218		RC	PLASTIC,B.CAB,HIPS,BLACK,CHINA	1.000
66		215720-00250		RC	PLASTIC,PANEL,HIPS,SPY BLACK,RT178 S.SCN	1.000
67		215710-00700		RC	PLASTIC,BATT.LID,HIPS,BLACK	1.000
68		215710-00600		RC	PLASTIC,PIECE DOOR,HIPS,BLACK	1.000
69		215120-00102		RC	PLASTIC,EPROM COVER,HIPS,BLACK	1.000
70		218183-03300		RC	PLASTIC,SWITCH ADAPTER,ABS,BLACK	1.000
71		218183-03400		RC	PLASTIC,SWITCH CAP,ABS,BLACK	1.000
72	*	215710-00501		RC	PLASTIC,KEY TOP,SMALL	12.000
73	*	215710-00901		RC	PLASTIC,KEY TOP,LARGE	5.000
74		354620-10000	1		PACKING ASSEMBLY,FOR RT178	1.000
75		360000-00240			LABEL,FOR SERIAL NO,ADHESIVE PAPER H+G	1.000
76		000125-00200			POLYBAG,300X200X0.045MM	1.000 FOR MANU,OPTION
77		000125-40320			POLYBAG,540X320X0.045MM	1.000 FOR UNIT
78		454620-00600			CARTON,FOR RT178,5PCS/CTN	.200
79		452220-01900			INSERT,FOR ST17,PAPER,FOR UNIT	1.000
80		452220-02000			INSERT,FOR ST17,PAPER,FOR ADAPTER	1.000 STANDARD
81		452220-02800			INSERT,FOR ST17 UL-8S,CORRUGATED PAPER	.000 UL-8S
82		340220-19000	1		CHESSMEN SET,ST17,178+184,RUB.MAG	1.000
83		340250-12411		RC	CHESSMEN,YO1C,16,SPRAY GOLD,RUB MAGNET	1.000
84		340250-17911		RC	CHESSMEN,YO1C,16,BLACK,RUB MAGNET	1.000

- RT178, MONTREUX Rev : 1

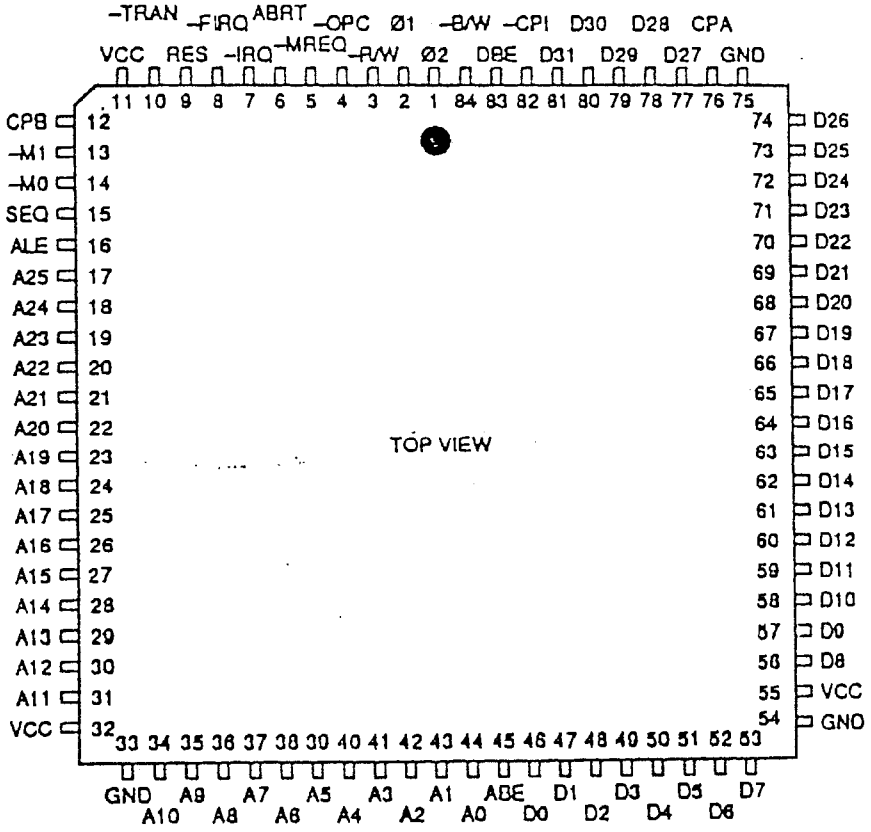
Dtg	Stock Code	Rev	Cons	Description	Qty Per Reference
	[illegible]4620-00000	1		OPTIONS ASSEMBLY,FOR RT178	1.000
	[illegible]4620-00700		RC	RATING PLATE,FOR RT178,PVC,H&G,CN	1.000
*	[illegible]4620-41100		RC	MANUAL,FOR RT178,E/G/F/D.H&G	1.000
*	[illegible]4620-61100		RC	GIFTBOX,FOR RT178,E/D/F/G/S/I,H&G	1.000
	[illegible]0110-02000		RC	CARD,GUARANTEE,GERMAN.H&G	1.000
	[illegible]0000-00390		RC	ADAPTER,VDE,5.8V,500MA,C+,BARREL,SWL	1.000
	[illegible]1000-00410		RC	ADAPTER,UL,5.8V,500MA,C+,BARREL,SWL	.000 UL
	[illegible]2000-00420		RC	ADAPTER,BS,5.8V,500MA,C+,BARREL,SWL	.000 BS
	[illegible]			ASSEMBLER MATERIAL CHARGE	
	[illegible]			ASSEMBLER LABOUR CHARGE	

Material Subtotal
Assembler Charge
Assembler Labour Charge
Non-consigned material Cost
Material Discrepancy Allowance

C.O.G.

PIN DIAGRAM

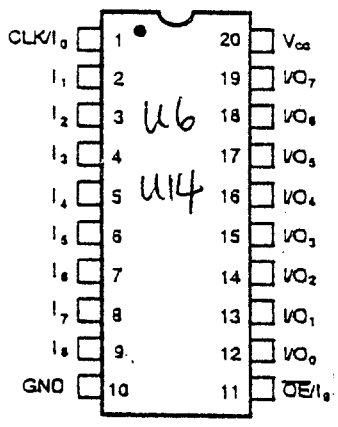
PLASTIC LEADED CHIP CARRIER (PLCC)

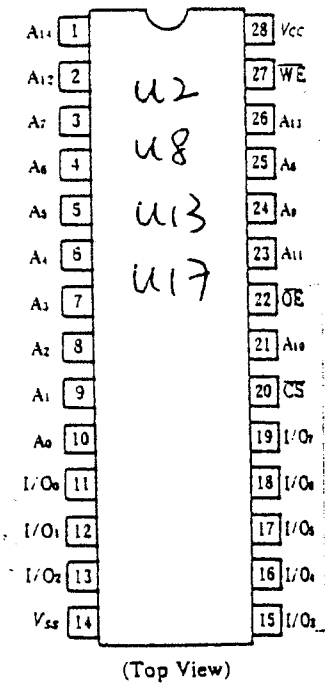


CONNECTION DIAGRAMS

Top View

DIP





(Top View)

RT 17

MONTREUX FUNCTIONAL TEST PROCEDURE

Purpose	Procedure	Observation
1. Power up	- Insert an adapter with output voltage = 5.6V	- No response

	- Press GO while keeping the BACK key pressed	- Row LEDs 8 and 7 light up then row LED 4-6 also light up.
		- After a while, all 16 LEDs will light shortly and new game sound is given out.
		- LCD shows
		`- Montreux -`
		`← →`
		- then
		`RAM cleared`
		`01. 00:00 00:00`
		`( )`

2. QC test mode	- Press ACL while keeping ←, → keys pressed	- LCD shows
		`QC Test Mode`
		`← →`
		and starts scanning as in Table 1

	- Press function keys as shown in Table 2	- See Table 2
	- Press 64 chessboard square in sequence	- Corresponding square LEDs are on and LCD show corresponding square coordinates in the format of `key =`
3. Reset unit	- Press ACL	- Row LEDs 8 and 7 light up then row LED 4-6 also light up. - After a while, all 16 LEDs will light shortly and new game sound is given out.

Purpose	Procedure	Observation
		- LCD shows - Montreux - ← →
		- then RAM is empty 01. 00:00 00:00 ( )
4. Multimove	- Press MENU	- LCD shows ⌜ game ( )
	- Press ↓	- LCD shows ⊢ settings ( )
	- Press ENTER	- LCD shows ⌜ oppo = norma ( ) →
	- Press ENTER	- LCD shows = ⌜ normal ( ) Note: = is blinking
	- Press ↓	- LCD shows = ⊢ 2 players ( ) Note: = is blinking
	- Press ENTER	- LCD shows ⌜ oppo = 2 pla ( ) →
	- Press MENU	- LCD shows RAM is empty 01. 00:00 00:00 ( )

Purpose	Procedure	Observation
	- Press F2, F4	- F2 then F4 LEDs turn on respectively - All LEDs are off, LCD shows Your Move 01. 00:00 00:03 (●) Note: Clock on the right side is counting up.
	- Press E7, E5	- E7 then E5 LEDs turn on respectively - All LEDs are off, LCD shows Your Move 02. 00:05 00:19 ( ) Note: Clock on the left side is counting up
	- Press G2, G4	- G2 then G4 LEDs turn on respectively - All LEDs are off, LCD shows Your Move 02. 00:06 00:30 (●) - Note: Clock on the right side is counting up
	- Press PLAY	- LCD shows Thinking ..... 02. 00:12 01:13 (●) - Note: Clock on the right side is counting up - then Move ♗ d8-h4 ≠ 02. 00:12 01:13 (●)
	- Press d8	- d8 LEDs are on - h4 LEDs are on and LCD shows Move ♗ d8-h4 ≠ 02. 00:12 01:13 (●)

Purpose	Procedure	Observation
	- Press h4	- LCD shows Checkmate 03. 00:12 01:13 ( )
5 Check jumper	- Press OFF	- LCD shows Off ? (Y N) 03. 00:13 01:13 ( ) Note: "Y" is blinking
	- Press ENTER	- LCD shows nothing
	- Press NEWGAME twice	- No response
	- Press GO	- Row LEDs 8, 7 light up, then row LEDs 4-6 also light up. - After a while, all 16 LEDs will light shortly and new game sound is given out. - LCD shows - Montreux - ← → then Game 2 moves 03. 00:12 01:13 ( ) Note: if LCD shows Game cleared 01. 00:00 00:00 ( ) or / RAM is empty 01. 00:00 00:00 ( ) it indicated that wrong jumper selection for SRAM

Remarks:
The time shown on the clocks may be different from the diagrams on this functional test procedure.

	Procedure	Observation
[redacted]	- Press BACK	- LCD shows Back ♔ d8-h4 ≠ 02. 00:12 01:13 (●) and h4 LEDs are on
	- Press h4	- d8 LEDs are on
		- LCD shows as above
	- Press d8	- LCD shows Your move 02. 00:12 01:42 (●) Note: black clock starts counting up
Check High voltage	- Repeat step 1 to 5 with input voltage at adapter socket (skip step 2) = 5.7V	
Check memory	- Press OFF	- LCD shows Off ? (Y N) 02. 00:14 01:14 (●) Note: Y is blinking and the black clocks count up
	- Press ENTER - Remove the adapter - Wait for 10 minutes or longer - Reinstall the energized 5.7V adapter	- LCD is blank

Purpose	Procedure	Observation

	- , Press GO	- Row LEDs 8, 7 light up, then row LEDs 4-6 also light up.
		- After a while, all 16 LEDs will light shortly and new game sound is given out.
		- LCD shows
		`- Montreux -`
		`←  →`
		then
		`Game 2 moves`
		`03. 00:12 01:13`
		`( )`
		Note: if LCD shows
		`RAM is empty`
		`01. 00:00 00:00`
		`( )`
		it indicated a problem with the memory backup circuit.

7. Burn-in test (A) (burn for 50 hours)	- ACL	- Row LEDs 8 and 7 light up then row LED 4-6 also light up.
		- After a while, all 16 LEDs will light shortly and new game sound is given out.
		- LCD shows
		`- Montreux -`
		`←  →`
		then
		`Game cleared`
		`01. 00:00 00:00`
		`( )`

	- Press MENU	- LCD shows
		`┌ game`
		`( )`

	Procedure	Observation
	- Press ↑	- LCD shows └ special ( )
	- Press ENTER	- LCD shows ┌ demo play ( )
	- Press ENTER	- LCD shows Demo play 01. 00:00 00:00 ( ) then starts playing automatically

A.

Computer is defective if

LCD shows :

Err X
01 YY:YY ZZ:ZZ

where X is a number

No move is given out when the PLAY key is pressed at the end of the burn-in test.

Improper LEDs lights up.

LCD is blank.

The move number of the left hand side of the LCD always shows "01"

B.

After 8 to 15 hours, follow the procedure below to test the unit

Press BACK key, press the chessboard squares according to the LEDs light up.
Then press PLAY key and press the chessboard squares according to the LEDs light up.
Repeat step 2.
Press MENU, ↑, ENTER, ENTER to continue the burn-in test.

Purpose	Procedure	Observation
8. **Burn-in** test (B) **(2 hours)**	- Press ACL while keeping ↑, ↓ keys pressed	- LCD shows self test ← → then t 00 00 00 00 c 00 00 00 00 the number adjacent to character C is counting
	- Press any key once (press any key once will toggles between error type menu and error count menu)	- LCD shows e 00 00 00 00 c 00 00 00 12 (the number on e & t must be zero throughout the test)

Note: The computer is defective if
1. The number on the upper row (e or t) is not zero.
2. Improper LEDs lights up.
3. LCD is blank.

Conditions:
1. During the function test, the power supply must be connected to a stabilizer.

RT

Table 1:

1. All DMZ of row 1, all f-segment of 7-segment digit and white symbol
2. Same as 1 + row 2 of DMZ, a-segment and king symbol
3. Same as 2 + row 3 of DMZ, b-segment and queen symbol
4. Same as 3 + row 4 of DMZ, g-segment and rook symbol
5. Same as 4 + row 5 of DMZ, c-segment and bishop symbol
6. Same as 5 + row 6 of DMZ, d-segment and knight symbol
7. Same as 6 + row 7 of DMZ, e segment and pawn symbol
8. Blank
9. The LCD scans from column 1 of DMZ 1 to column 5 of DMZ 12, following symbol will be turn on during above scanning are left arrow, dot, black symbol, colon1, colon2 and right arrow
10. Blank
11. DMZ (1,3,5,7,9,11), 7-segment digit (2,4,6,8,10,12), right arrow, left arrow, white symbol, Queen, Knight, dot and colon 1 will be turn on at the same time.
12. DMZ (2,4,6,8,10,12), 7-segment digit (1,3,5,7,9,11), black symbol, King, Rook, Bishop, Pawn and colon 2 will be turn on at the same time.
13. All segment turn on
14. Blank
15. LCD shows

key =

Table2

Key pressed	LCD shows	Key pressed	LCD shows
OFF	key = OFF	↓	key = ↓
NEW GAME	key = N. GAME	ENTER	key = ENTER
PLAY	key = PLAY	♔	key = K
BACK	key = BACK	♕	key = Q
←	key = ←	♖	key = R
→	key = →	♗	key = B
MENU	key = MENU	♘	key = N
↑	key = ↑	♙	key = P