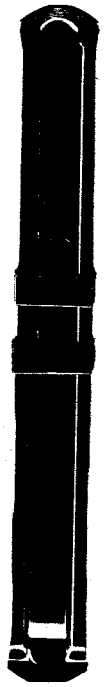
PROJECT : RT5 (Modena)
DOC. NO. : RT5-PG-010
REV. : 0
DATE : 22-6-94

GENERAL PRODUCT SPECIFICATIONS FOR RT5

A.	Battery requirement	:	1.5 V (size 'AA' or 'UM-3') x 6 pcs Alkaline type recommended
B.	Operating voltage	:	6.6 - 10.2 Volts
C.	Adapter Operating Voltage	:	8 - 12 Volts
D.	Current consumption	:	Battery operation Normal mode at battery voltage = 9V With two LEDs on 30mA typical 45mA max. Adapter operation Normal mode at adapter voltage = 9V With two LEDs on 30mA typical 45mA max.
E.	Power consumption	:	270mW typical 405mW max
F.	System clock frequency	:	4.19MHz ±5% (at battery voltage = 9 V)



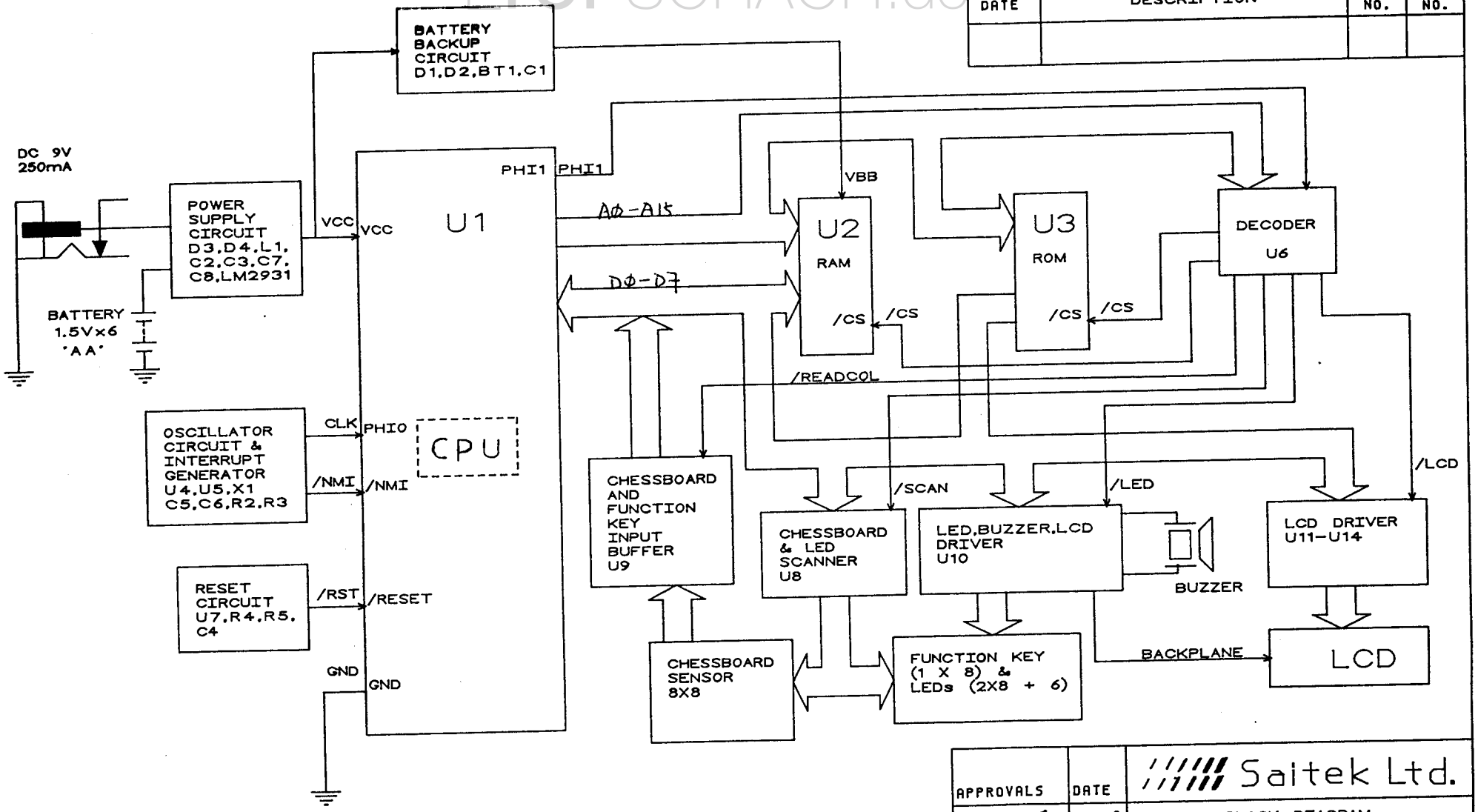
PREPARED BY : Leon
Leon Wong

APPROVED BY :

DIST : BDM1, QAM, SEE, SEA, IEM

Filename : /BDD1/RT5-PS.Doc

REVISION			
DATE	DESCRIPTION	ECN NO.	REV. NO.



APPROVALS	DATE	Saitek Ltd.
DRAWN DF	26/10/94	BLOCK DIAGRAM
CHECK Leon	26/10/94	TITLE: MODENA (RT5)
B.D.D	26/10/94	446
Q.A	26/10/94	DWG.NO. RT5-PE-014 REV. 0

Project : RT5 (Modena)

Doc No. : RT5-PS-013

Rev. : 0

Date : 10 Oct. 1994

ADJUSTMENT PROCEDURE FOR RT5

Object : To adjust system clock frequency.

Equipment needed : Frequency counter or Oscilloscope capable of frequency measurement up to 20MHz.

Procedure :

1. Connect battery terminals with 9V power supply.
2. Place probe of counter/scope at pin 9 or 10 of U4.
   If frequency measured is out of specified range (4.148-4.232MHz) replace C5, C6, R2 or crystal until counter/scope reading is within specification.

Prepared by : Leon
Leon Wong

Approved by :

Dist : [redacted], SEE, SEA

Filename : /BDD1/RT5-PS.Doc

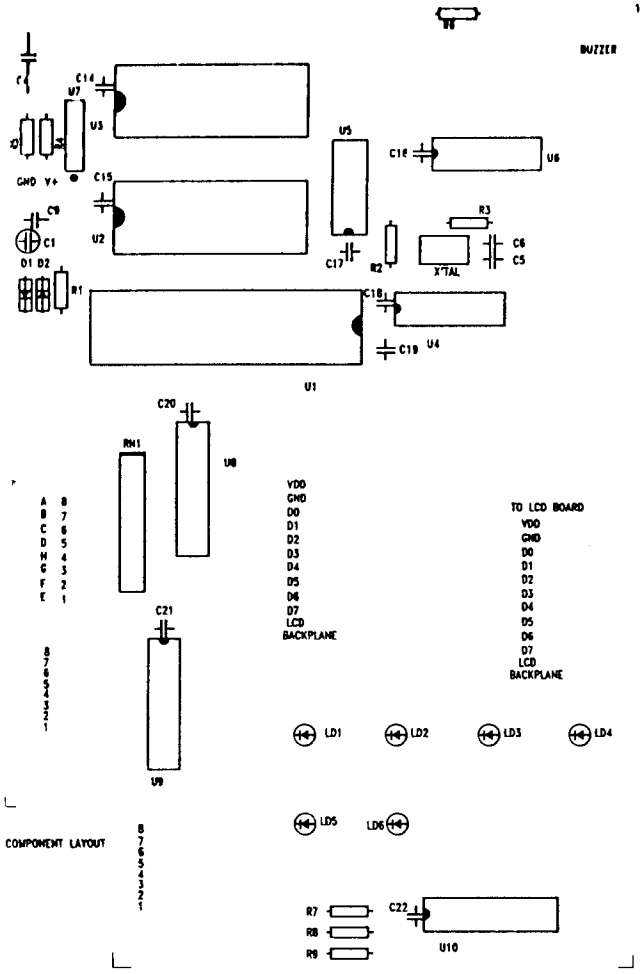
40

MODENA Trouble Shooting Chart

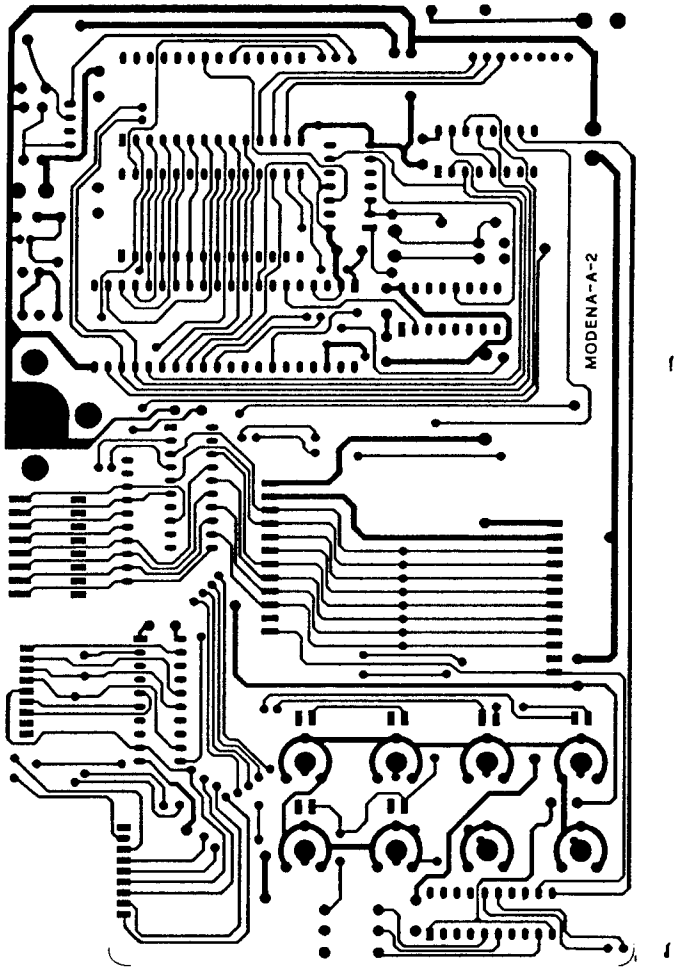
SYMPTOMS		POSSIBLE CAUSES
Unit cannot be turned ON	1.	Check if Vcc within the range from 4.75V to 5.25V. If Vcc is not within this range, check for: i) Dead or weak batteries. ii) Open or shorted circuit in Ground traces and Vcc traces. iii) Broken connections in battery wiring. iv) Broken connections between adapter socket and logic PCB. v) Adapter voltage > 8.0V when unit is turned on. vi) Power supply circuit functional good. If not, check if L1, D3, D4, C2, C3, C7, C8, VR1 are defective.
	2.	Check for clock signal: Look for 4.19 MHz +/-1% (battery=9V) at U1 pin 39. If not, check if R2, R3, C5, C6, X1, U5 are defective.
	3.	Check for reset signal: Check if U1 pin 40 logic 'High' after power on. If not, check if R4, R5, C4, U7 are defective.
	4.	Check if U1 is defective.
No sound	1.	Check for broken wirings from beeper to PCB.
	2.	Check if beeper is defective.
	3.	Check for pulse output from U10 pin 16 and pin 19 when 'SOUND ON'.
Command key LED missing or turn on when it should not	1.	Check for broken traces on PCB.
	2.	Check if LED is defective.
	3.	Check if R7 is defective.
	4.	Check for U10 pin 5 logic 'HIGH' when corresponding LED is 'ON'.
LED position '1' to position '8' missing or turn on when it should not	1.	Check for broken traces on PCB.
	2.	Check if LED is defective.
	3.	Check if R9 is defective.
	4.	Check for U10 pin 9 logic 'HIGH' when LED is 'ON'.
LED position 'A' to position 'H' missing or turn on when it should not	1.	Check for broken traces on PCB.
	2.	Check if LED is defective.
	3.	Check if R8 is defective.
	4.	Check for U11 pin 6 logic 'HIGH' when LED is 'ON'.
No response or improper response to command keys or chessboard	1.	Check for loose contacts or misalignment between sensors and PCB traces.
	2.	Check if sensor connector is defective.
	3.	Check for broken or shorted traces on PCB or sensor.
	4.	Check for logic 'HIGH' at U9 pin 3, 5, 7, 9, 12, 14, 16, 18 when no key is pressed. If not, check if RN1 and U9 are defective.

SYMPTOMS		POSSIBLE CAUSES
LCD no display or missing segment	1.	Check for broken traces on LCD PCB.
	2.	Check for bad contacts between LCD, zebra connector and PCB.
	3.	Check for pulse output from U11-U14 pin 1 and 9.
	4.	Check for pulse output from U10 pin 12.
	5.	Check if LCD is defective.
No memory function	1.	Check if Lithium-battery is dead or weak.
	2.	Check if D2, R1 C1, C9 are defective.
Excessive current drain Current > 45mA when 'ON'	1.	Check for component wirings or shorted trace on PCB.
	2.	Check for contaminations and/or foreign particles on PCB.
	3.	Check for capacitor leakages on C2, C3, C7, C8.
	4.	Check if VR1 is defective.
Generates illegal moves	1.	Check if batteries are dead or weak.
	2.	Check if U8 is defective.

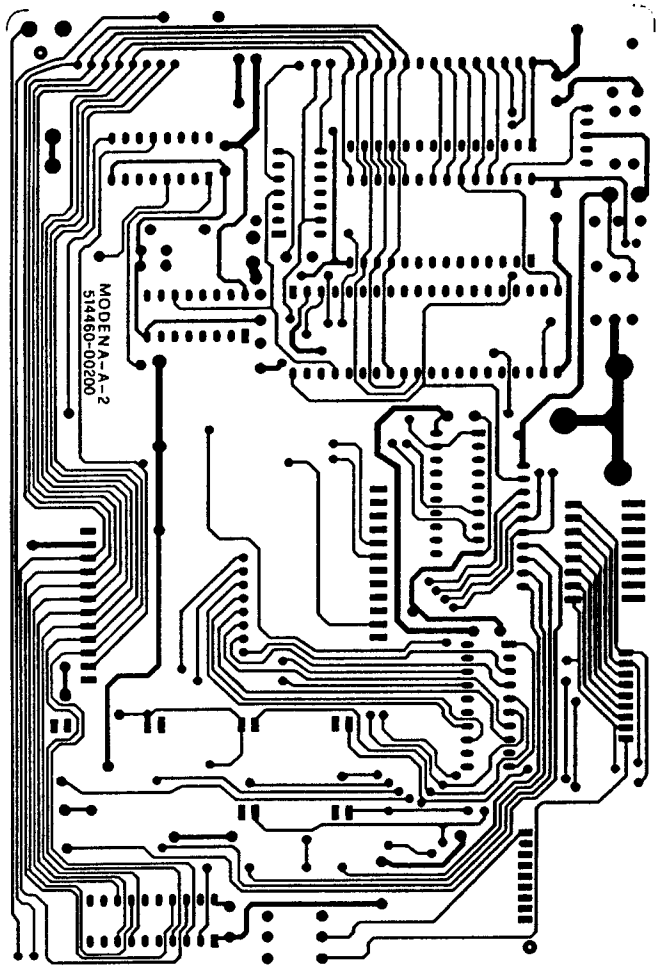
Dist : BDM1, QAM



White mark



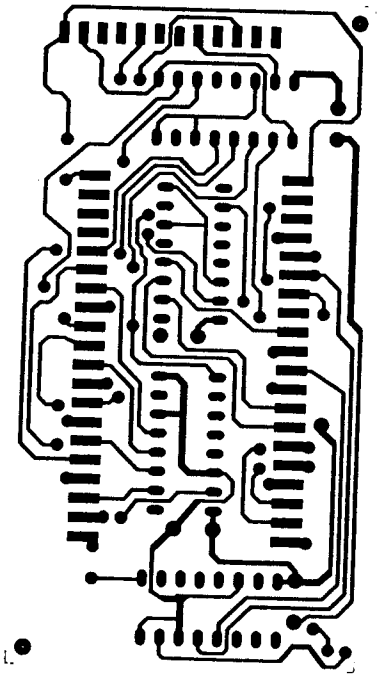
Compant side



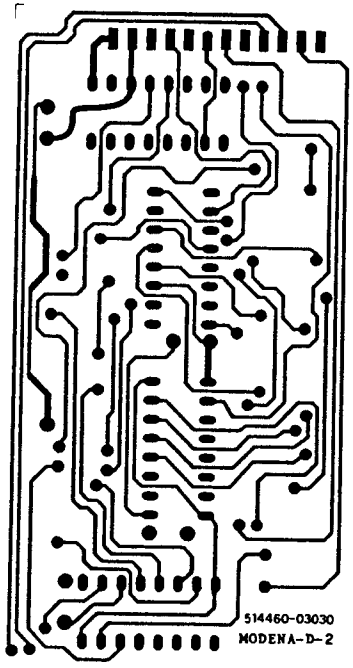
Solder side

LOGIC PCB

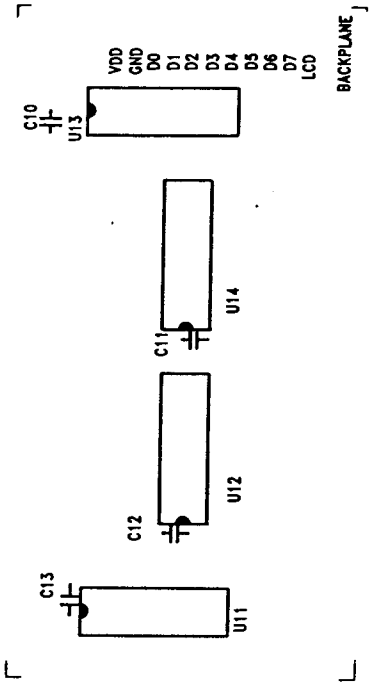
RTS



Solder side



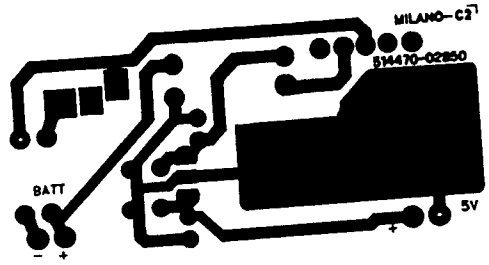
Component side



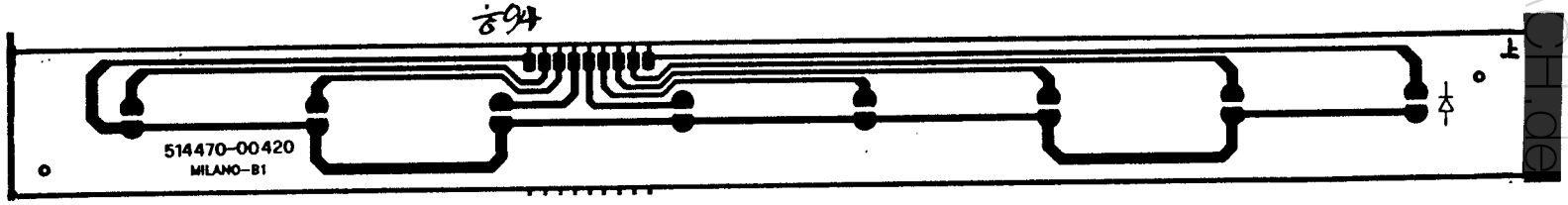
White mark

LCD PCB

RT5

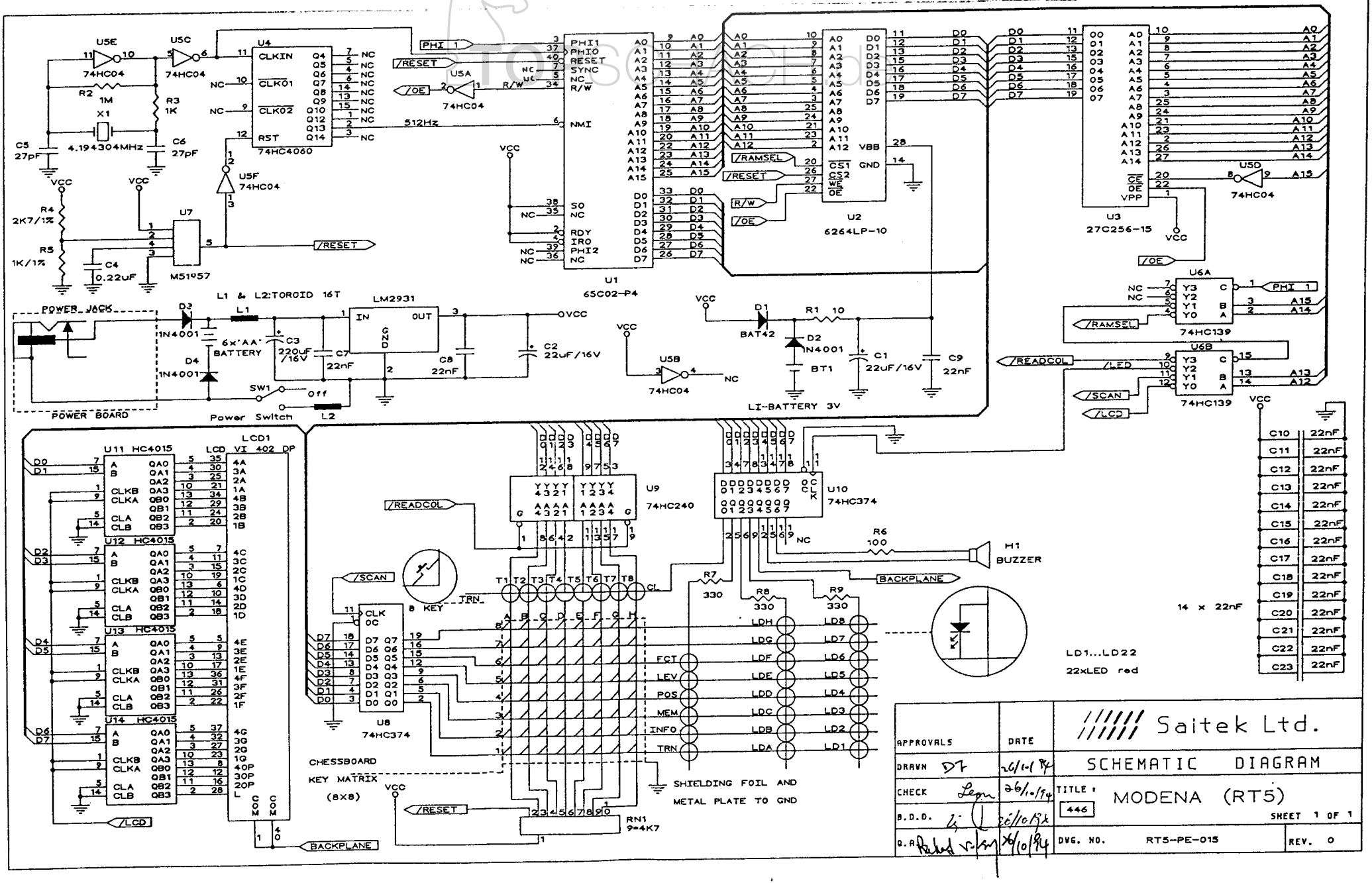


Power PCB



LED PCB

RT5/6



APPROVALS	DATE	Saitek Ltd.
DRAWN DT	26/1-/94	SCHEMATIC DIAGRAM
CHECK Leon	26/1-/94	TITLE : MODENA (RT5)
B.D.D.	26/10/94	446 SHEET 1 OF 1
Q.A Robert Wilson	26/10/94	DWG. NO. RT5-PE-015 REV. 0

SAITEK

BILL OF MATERIALS

PROJECT : RT5 (Modena)

ART.NO. : 446

SHIP VER. : MEV

REVISION : 1

REVISION HISTORY

REVISION	DATE	BY	DESCRIPTION OF CHANGES
P1	22.06.94	Leon Wong	Preliminary BOM.
1	22.08.94	Leon Wong	Revise of BOM; Add polybag for unit and change paper insert per ECN94085; add battery holder; modification of chessmen set per ECN94078.

RELATED DOCUMENTS REV

Schematic dwg :

Prepared By : Leon Wong

Approved by : BDM1

Distribution :
+1.00 [X] MMM,FAM,IEM, SEE; [redacted]
+0.10 [ ] MMM,FAM,IEM SEE; QAM
+0.01 [ ] MMM,IEM

Date issue : 23 AUG 1994

CHG MOD: NW=new component; * =desc/PN/Ref changed +/-=cost up/down: C/NC=consigned/non-consigned; +/-Q=QTY up/down

- RT5,MEV MODENA Rev : 1

Level	Item	Chg	Stock Code	Rev	Cons	Description	Qty Per	Reference
			984460-00000	1		UNIT ASSEMBLY FOR RT5	1.000	
			914460-00001	1		GUTS ASSEMBLY - LOGIC	1.000	
	1		514460-00200		RN	PCB,LOGIC,D.S.,FR4,RT5	1.000	
	2		741580-00139		RC	TTL,139,DUAL 2 TO 4 DECODER/MUX,HC	1.000	U6
	3		740993-00004		RC	TTL,-04,HEX INVERTOR,HC	1.000	U5
	4		741520-00240		RC	TTL,-240,OCTAL BUFFER 3 STATE,HC	1.000	U9
	5		741233-00374		RC	TTL,-374,OCTAL D-TYPE FLIP-FLOP,HC	2.000	U8,U10
	6		741253-04060		RC	TTL,-4060,14-STAGE BINARY COUNTER,HC	1.000	U4
	7		832100-06264		RC	SRAM,6264,8KX8,100NS,CMOS	1.000	U2
			850410-8457F	1	RC	P.EPROM,RT5,32KX8,150NS,457F /	1.000	U3
	8		842150-27256		RC	EPROM,BLANK,27C256,32KX8,150NS	1.000	
	9		41EPR			EPROM 27C256 PROGRAMMING	1.000	
	10		750028-51957		RC	IC,RESET CIRCUIT CONTROL,M51957	1.000	U7
	11		812505-06502		RC	CPU,65C02,5MHZ,CMOS	1.000	U1
	12		812605-06502		RC	CPU,65C02,6MHZ,CMOS	.000	U1 ALTERNATIVE
	13		000140-28254		RN	IC SOCKET,DIP,28PINS,P=2.54MM	1.000	FOR EPROM
	14		000140-40254		RN	IC SOCKET,DIP,40PINS,P=2.54MM	1.000	FOR 6502
	15		654200-20000		RC	SCHOTTY DIODE,BAT42	1.000	D1
	16		654148-10000		RN	DIODE,SWITCHING,1N4148	1.000	D2
	17		612721-31102		RN	RESISTRO,FIXED C-FILM,2K7,1%,1/4W	1.000	R4
	18		611021-31102		RN	RESISTOR,FIXED C-FILM,1K,1%,1/4W	1.000	R5
	19		611015-31102		RN	RESISTOR,FIXED C-FILM,100,5%,1/4W	1.000	R6
	20		611025-31102		RN	RESISTOR,FIXED C-FILM,1K,5%,1/4W	1.000	R3
	21		611055-31102		RN	RESISTOR,FIXED C-FILM,1M,5%,1/4W	1.000	R2
	22		611005-31102		RN	RESISTOR,FIXED C-FILM,10,5%,1/4W	1.000	R1
	23		613315-31102		RN	RESISTOR,FIXED C-FILM,330,5%,1/4W	3.000	R7-R9
	24		614725-32110		RN	RESISTOR,ARRAY,C-FILM,4.7K,5%,1/4W,10	1.000	RN1
	25		644190-02130		RC	CRYSTAL,4.19MHZ,30PPM	1.000	
	26		62223K-05011		RN	CAPACITOR,C-CAP,0.022UF,+/-10%,50V	10.000	C9,C14-C22
	27		62101K-01611		RN	CAPACITOR,C-CAP,100PF,+/-10%,16V	2.000	C5-C6
	28		62224M-01611		RN	CAPACITOR,C-CAP,0.22UF,+/-20%,16V	1.000	C4
	29		62226Z-01615		RN	CAPACITOR,E-CAP,22UF,+80-20%,16V	1.000	C1
	30		000190-00020		RC	CONNECTOR,DOUBLE CONTACT,FEMALE,8-PIN	2.000	
	31		000060-11043		RN	STRAND WIRE,BLACK,L=110MM,E=3.5MM,AWG28	1.000	
	32		000010-00100		RN	ACL,RESET CONTACT,D=10MM,CR STEEL	6.000	USE AS BUTTON
	33		000064-06041		RN	STRAND WIRE,YELLOW,L=60MM,E=3.5MM,AW630	2.000	TO BUZZER
	34		000130-00270		RN	BUZZER,D=27MM	1.000	
	35		214470-00200		RC	PLASTIC,BUZZER HOLDER,HIPS	1.000	
	36		000260-00004		RC	BATTERY,LITHIUM,2032,3V	1.000	
	37	NW	224470-03500		RC	METAL,BATTERY HOLDER,PH.BRONZE,NI-PLT	1.000	HOLD LI. BATT.
	38		660001-11003		RC	LED,RED,DOME,D=3MM,TOSHIBA,TLR124	6.000	LD1-LD6
			914470-00002	1	RC	GUTS ASSEMBLY,LED, FOR RT6	1.000	
	39		514470-00420		RN	PCB,LED,S.S,PAPER PHENOLIC	2.000	
	40		660001-11003		RC	LED,RED,DOME,D=3MM,TOSHIBA,TLR124	16.000	LD7-LD22
	41		000030-01280		RN	CONN ARRAY,N=9,L=110MM,P=2MM,E=3.5MM	1.000	
	42		000030-01250		RN	CONN ARRAY,N=9,L=210MM,P=2MM,E=3.5MM	1.000	

994460-11MEV - RT5,MEV MODENA Rev : 1

Level	Item	Chg	Stock Code	Rev	Cons	Description	Qty Per	Reference
2			914460-00003	1	RN	GUTS ASSEMBLY, LCD FOR RT5	1.000	
3	43		000030-01300		RN	CONN ARRAY N=14,L=100MM,P=2.54MM,E=3.5MM	1.000	
3	44		741590-04015		RC	TTL,DUAL 4 STAGE SHIFT REGISTER,HC	4.000	U11-U14
3	45		000073-21024		RN	SCREW,S/T,+PAN,M1.7X6MM,A	6.000	
3	46		514460-03030		RN	PCB,LCD,D.S,FR4	1.000	
3	47		62224K-01611		RN	CAPACITOR,C-CAP,0.22UF,+/-10%,16V	4.000	
3	48		214460-00400		RC	PLASTIC,LENS FOR LCD,ACRYLIC,CLEAR	1.000	
3	49		534460-00520		RC	LCD, FOR RT5	1.000	
3	50		250000-00542		RC	ZEBRA CONNECTOR,SG,51X3.5X3.8MM,P=0.18MM	2.000	
2			914470-00005	1	RC	GUTS, ASSEMBLY, POWER	1.000	
3	51		514470-02850		RN	PCB,POWER,S.S,1.6MM PAPER PHENOLIC	1.000	
3	52		690001-02931		RC	ELECT,REGULATOR,5V,150MA,TO-220,LM2931AT	1.000	
3	53		654001-20000		RN	DIODE,RECTIFIER,1N4001	2.000	D3,D4
3	54		62223K-05011		RN	CAPACITOR,C-CAP,0.022UF,+/-10%,50V	2.000	ON POWER PCB
3	55		62226I-01615		RN	CAPACITOR,E-CAP,22UF,+80-20%,16V	1.000	C4
3	56		62227I-01615		RN	CAPACITOR,E-CAP,220UF,+80-20%,16V	1.000	C3
3	57		000062-06041		RN	STRAND WIRE,RED,L=60MM,E=3.5MM,AWG30	1.000	TO BATT.
3	58		000060-17043		RN	STRAND WIRE,BLACK,L=170MM,E=3.5MM,AWG28	1.000	TO BATT.
3	59		000062-22043		RN	STRAND WIRE,RED,L=220MM,E=3.5MM,AWG28	1.000	TO LOGIC PCB
3	60		000060-22043		RN	STRAND WIRE,BLACK,L=220MM,E=3.5MM,AWG28	1.000	TO LOGIC PCB
3	61		630003-10000		RC	INDUCTOR,TOROID,16T	1.000	
3	62		000220-00014		RC	SOCKET,DC POWER JACK,TD18-023	1.000	
3	63		526890-00420		RN	SWITCH,1P2T,FOR IH3,PIC-SS-12F23-G6	1.000	
3	64		000110-00050		RN	NUT,M3.0XP0.5X1.8MM,MILD STEEL	1.000	
3	65		000071-20524		RN	SCREW,M/S,+PAN,M3.0XP0.5X6MM,FLAT	1.000	2931 HEAT SINK
3	66		000090-00270		RN	WASHER,METAL,INT.TOOTH,ID3.3,OD6.3,T0.6	1.000	2931 HEAT SINK
2			964460-00000	1	RN	CASING ASSEMBLY FOR RT5	1.000	
3	67		224470-02600		RC	METAL,B-CONT,"+",BRONZE,NI-PLT,RT6	1.000	
3	68	*	224470-00300		RC	METAL,BATT.CONTACT "+",PH BRONZE,NI-PLT	.000	ALTERNATIVE
3	69		224470-02700		RC	METAL,B-CONT,"+-",BRONZE,NI-PLT,RT6	2.000	
3	70		224470-02500		RC	METAL,B-CONT.'-',BRONZE,NI-PLT,RT6	1.000	
	71		314470-00500		RC	SENSOR,CHESSBOARD,CONV.,RT6	1.000	
3	72		000073-21224		RN	SCREW,S/T,+PAN,M2.3X8MM,A	4.000	FOR LCD
3	73		000073-41434		RN	SCREW,S/T,+CSK,HD,M2.6X8MM,A	3.000	BOTTOM CAB.
3	74		000073-21434		RN	SCREW,S/T,+PAN,M2.6X8MM,A	11.000	MAIN LOG PCB
3	75		000073-22434		RN	SCREW,S/T,+PAN,M2.6X8MM,BT	1.000	BOTTOM CAB
3	76		000073-91434		RN	SCREW,S/T,+WASHER,M2.6X8MM,A	3.000	POWER & LED PCB
3	77		324470-01200		RC	OVERLAY,FOR RT6,CHESSBOARD,LEXAN	1.000	
3	78		000021-00140		RN	RUBBER FOOT,3M,30.5MMX1.6MM,ADHESIVE	4.000	
3	79		224470-01300		RC	METAL PLATE,213.3X202.2MM,W/D TAPE,RT6	1.000	
3	80		294470-01400		RC	FELT,DIA.=23MM,BLACK	1.000	
2			954460-00000	1	RC	CABINET SET,FOR RT5	1.000	
4	81		214470-01110		RC	PLASTIC,TOP CAB,HIPS,SPY.BLACK,S.SCREEN	1.000	
4	82		214470-00900		RC	PLASTIC,BOTTOM CAB,HIPS,SPY. BLACK	1.000	
4	83		214470-00710		RC	PLASTIC,BATT.DOOR,HIPS,SPY.BLACK,S.SCR'N	1.000	
4	84		214470-00800		RC	PLASTIC,KNOB KEY,ABS,BLACK	8.000	
			944460-10000	1	RC	PACKING ASSEMBLY FOR RT5	1.000	

974460-11MEV - RT5,MEV MODENA Rev : 1

Level	Item	Chg	Stock Code	Rev	Cons	Description	Qty Per	Reference
2	85		360000-00240		RN	LABEL,FOR SERIAL NO,ADHESIVE PAPER H+G	1.000	
2	86		454460-01100		RN	CARTON FOR RT5,6PCS/CTN	.167	
2	87	*	454490-01000		RN	INSERT,FOR RT5/6/8,MAIN BODY,CORR.PAPER	1.000	ECN94085
2	88	*	454490-01010		RN	INSERT,FOR RT5/6/8,TOP COVER,CORR.PAPER	1.000	ECN94085
2	89	*	000124-50310		RN	POLYBAG,450X310X0.045MM	1.000	UNIT (ECN94085)
2	90		370000-XXXXX		RC	LABEL,COMMON,CUSTOMER LABELS	1.000	
2			244460-22700	1	RC	CHESSMEN SET,FOR RT5,222+224	1.000	
3	91		244470-22211		RC	CHESSMEN,RT6,17,BLACK,RUB.MAGNET	1.000	ECN94078
3	92		244470-22411		RC	CHESSMEN,RT6,17,GREY,RUB.MAGNET	1.000	ECN94078
1			974460-10MEV	1	RC	OPTION ASSEMBLY RT5	1.000	
2	93		414460-61100		RC	MANUAL, FOR RT5,E/G/D/S/I/F	1.000	
2	94		424460-61100		RC	SIFTBOX,FOR RT5,E/G/F/D/S/I	1.000	
2	95		370000-16500		RC	ADDENDUM,COM#165,TEL & SERVICE NOTE,H+G	1.000	
2	96		370000-15900		RC	ADDENDUM,COM#159,TOY SYMBOL,H+G	1.000	
2	97		430008-51000		RC	CARD,WARRANTY,E/G/F/D/S,SWL,NON CHESS	1.000	
2	98		370000-16000		RC	STICKER,COM#160,CE MARK ON BOX,H+G	1.000	
2	99		324470-00600		RC	BACK PLATE,FOR RT6,PVC,H+G	1.000	
	100		40AMC			ASSEMBLER MATERIAL CHARGE		
	101		40ALC			ASSEMBLER LABOUR CHARGE		

RICOH

No. 84-01 4-1-1984

Microelectronic Specification

RP65C02

CMOS 8-bit MICROCOMPUTER SYSTEM

GENERAL DESCRIPTION

The RP65C02 is 8-bit CMOS CPU. It has the instruction set and pins which are fully compatible with the NMOS 6502 CPU, and in addition, with 59 new instructions. It is provided with the features of the CMOS such as the powerdown, standby mode, etc.

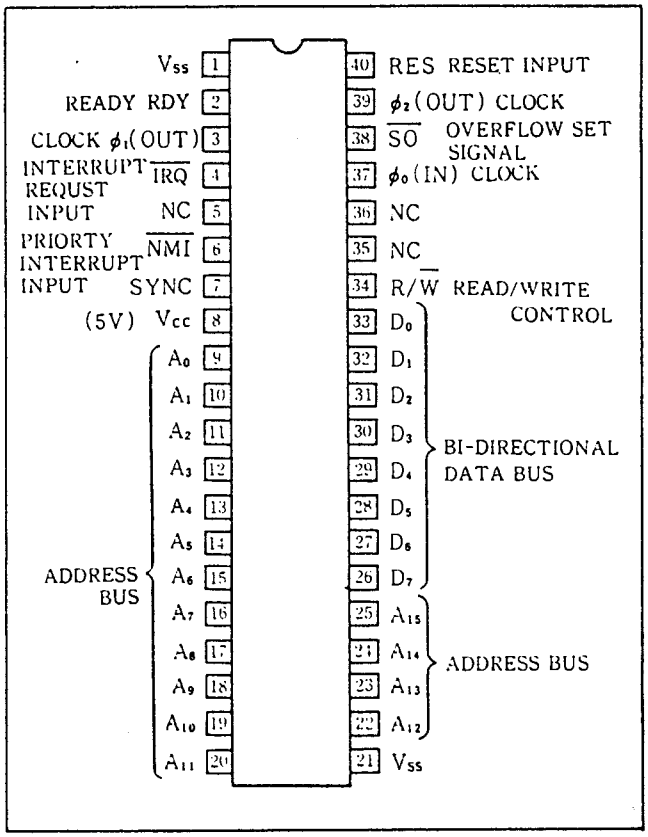
FEATURES

- Single power supply 5V operation
- CMOS 3μ silicon gate process
- Low power dissipation
- 8-bit bi-directional data bus, parallel processing
- 66-type 210 instructions
- Powerful 13-type addressing modes
- Programmable stack pointer
- Maskable interrupt and non-maskable interrupt
- 6-type internal registers
- Enable to connect the external memory with up to 64Kbytes
- Reference clock 1~4 MHz
- Executable single-instruction
- Computable decimal and binary
- Bus compatible with M6800
- Pin compatible with ROCKWELL R65C02

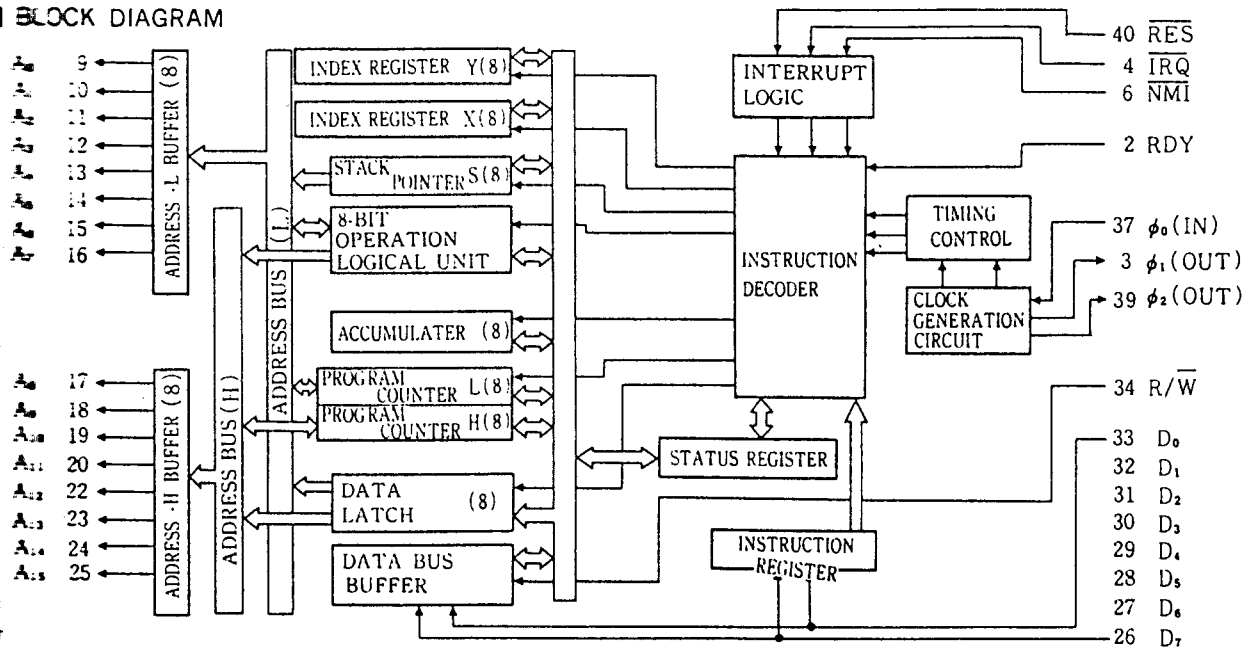
APPLICATIONS

- Hand-held computer, etc.

PIN CONFIGURATION (Top view)



BLOCK DIAGRAM



National Semiconductor

LM2931 Series Low Dropout Regulators

General Description

The LM2931 positive voltage regulator features a very low quiescent current of 1 mA or less when supplying 10 mA loads. This unique characteristic and the extremely low input-output differential required for proper regulation (0.2V for output currents of 10 mA) make the LM2931 the ideal regulator for standby power systems. Applications include memory standby circuits, CMOS and other low power processor power supplies as well as systems demanding as much as 150 mA of output current.

Designed primarily for automotive applications, the LM2931 and all regulated circuitry are protected from reverse battery installations or 2 battery jumps. During line transients, such as a load dump (60V) when the input voltage to the regulator can momentarily exceed the specified maximum operating voltage, the regulator will automatically shut down to protect both internal circuits and the load. The LM2931 cannot be harmed by temporary mirror-image insertion. Familiar regulator features such as short circuit and thermal overload protection are also provided.

Fixed output of 5V is available in the plastic TO-220 power package or the popular TO-92 package. An adjustable output version, with on/off switch, is available in a 5-lead TO-220 package.

Features

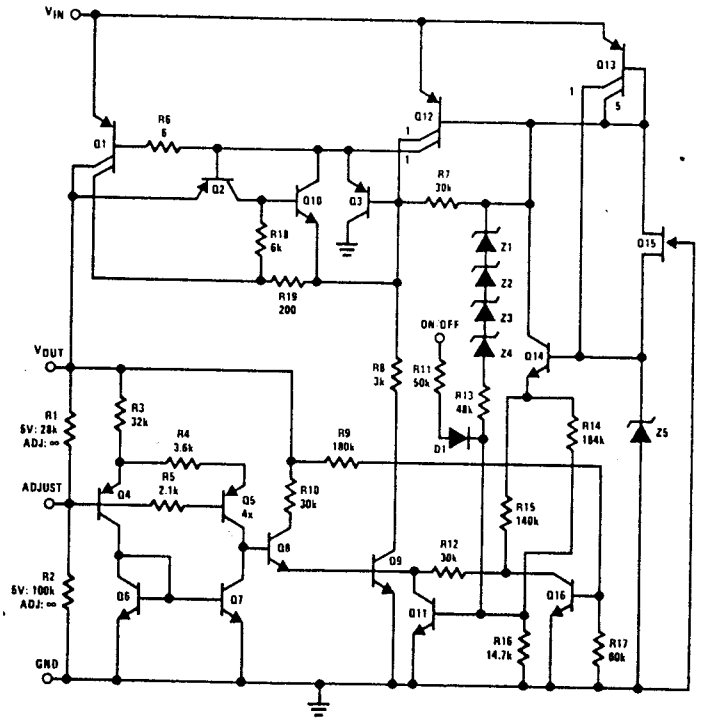
- Very low quiescent current
- Output current in excess of 150 mA
- Input-output differential less than 0.6V
- Reverse battery protection
- 60V load dump protection
- −50V reverse transient protection
- Short circuit protection
- Internal thermal overload protection
- Mirror-image insertion protection
- Available in plastic TO-220 or TO-92
- Available as adjustable with TTL compatible switch

Output Voltage Options

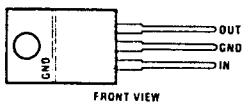
LM2931AT-5.0	5V	LM2931AZ-5.0	5V
LM2931T	Adjustable		

(Contact factory for other fixed output options.)

Schematic and Connection Diagrams

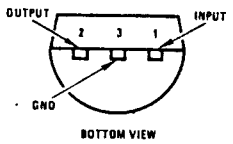


TO-220 3-Lead



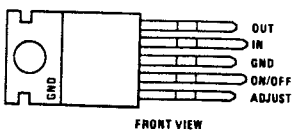
Order Number LM2931AT-5.0
See NS Package T03B

TO-92



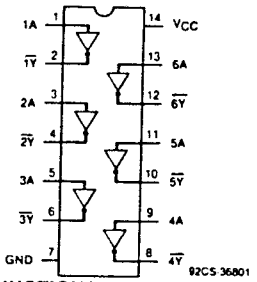
Order Number LM2931AZ-5.0
See NS Package Z03A

TO-220 5-Lead



Order Number LM2931T
See NS Package T05A

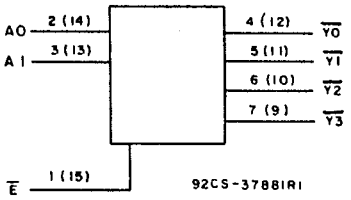
CD54/74HC04, CD54/74HCT04



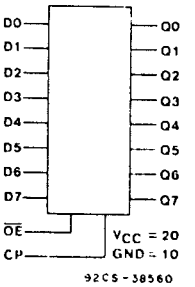
FUNCTIONAL DIAGRAM AND TERMINAL ASSIGNMENT

CD54/74HC139, CD54/74HCT139

FUNCTIONAL DIAGRAM

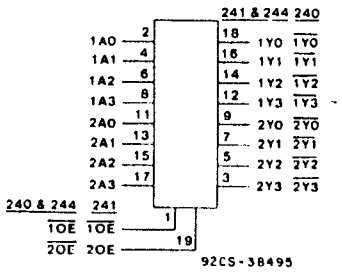


CD54/74HC374, CD54/74HCT374
CD54/74HC574, CD54/74HCT574



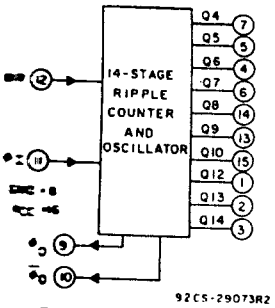
FUNCTIONAL DIAGRAM

CD54/74HC240, CD54/74HCT240
CD54/74HC241, CD54/74HCT241
CD54/74HC244, CD54/74HCT244

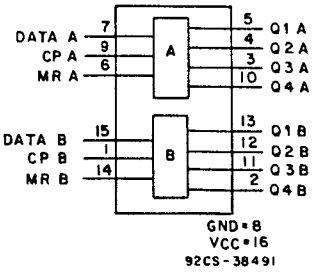


FUNCTIONAL DIAGRAM AND TERMINAL ASSIGNMENT

CD54/74HC4060, CD54/74HCT4060



FUNCTIONAL DIAGRAM



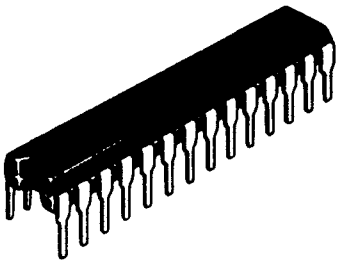
FUNCTIONAL DIAGRAM

Dual 4-Stage Static Shift Register

Type Features:

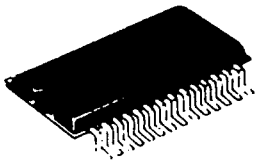
- *Maximum frequency, typically 60 MHz*
  C_L=15 pF, V_{CC}=5 V
- *Positive-edge clocking*
- *Overriding reset*
- *Buffered inputs and outputs*

HM6264ASP Series



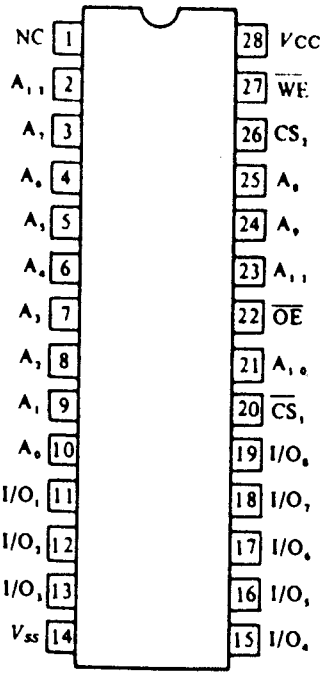
(DP-28N)

HM6264AFP Series



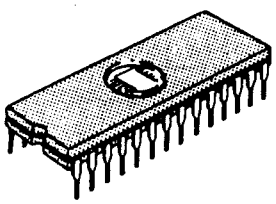
(FP-28D/DA)

■ PIN ARRANGEMENT



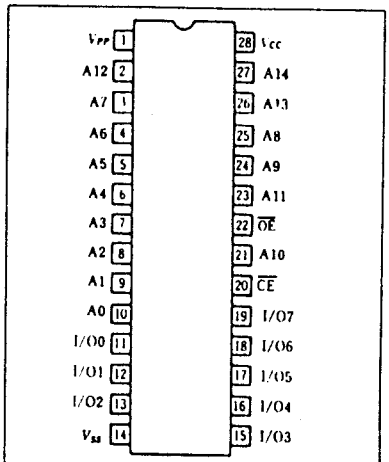
(Top View)

27C256



(DG-28)

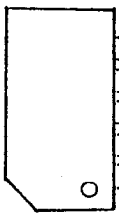
Pin Arrangement



(Top view)

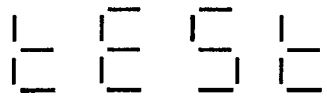
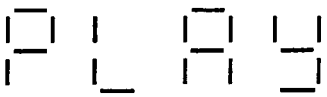
PIN CONFIGURATION (TOP VIEW)

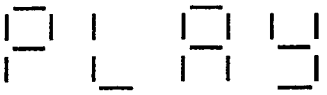
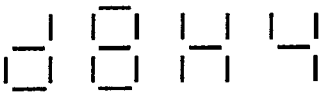
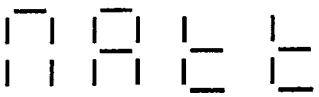
M51975A/BL M51958A/BL

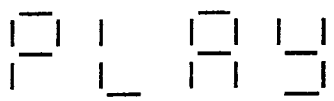
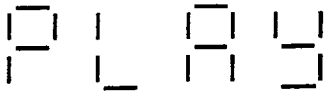


8. FUNCTIONAL TEST PROCEDURE FOR RT5 (Modena)

Slide the GO/STOP switch to STOP position, then insert six AA size batteries into battery compartment and perform following test.

Purpose	Procedure	Observation
1. QC mode	- Press and hold the BOOK and INFO key while slide the STOP/GO switch to Go position	- A beep sound is emitted - LCD shows 
	- Press the function key according to Table 1 in sequences	- See Table 1
	- Press 64 chessboard square in sequence	- Corresponding LEDs are turned ON and displayed on LCD in the format - X X - where XX is the coordinate of the square
2. Reset	- Press ENTER and CLEAR at the same time	- New game sound is emitted - LCD shows 

Purpose	Procedure	Observation
3. Check Multimove	- Press MEMORY	- LCD shows 
		- MEMORY LED is ON
	- Press F2, F4, E7, E5, G2, G4	- Corresponding move is shown on LCD
		- Corresponding square LED are ON
	- Press CLEAR	- MEMORY LED is OFF
		- LCD shows 
	- Press ENTER	- D8 LEDs are ON
		- LCD shows 
	- Press D8	- LCD shows as above
		- H4 LEDs are ON
	- Press H4	- FUNCTION LED is flashing
		- LCD shows 

Purpose	Procedure	Observation
4. Check Adapter	- Slide the GO/STOP switch to STOP position	- All LEDs / LCD off
	- Insert a non-energized adapter into the unit	- Same as above
	- Slide the GO/STOP switch to GO position	- FUNCTION LED is flashing - LCD shows 
	- Slide the GO/STOP switch to STOP position	- All LEDs / LCD off
	- Replace the non-energized adapter by an energized adapter	- Same as above
	- Slide the GO/STOP switch to GO position	- FUNCTION LED is flashing - LCD shows 
	- Slide the GO/STOP to STOP position	- All LEDs / LCD off
	- Remove the batteries for the unit	- Same as above
	- Slide the GO/STOP to GO position	- Function LED is flashing - LCD shows 

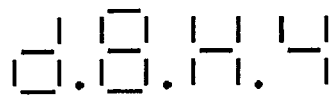
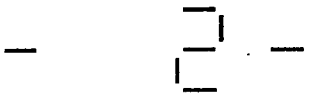
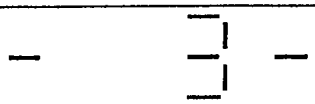
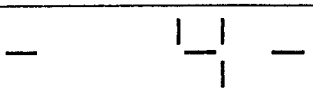
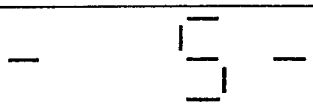
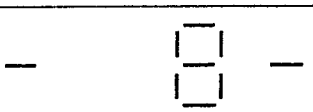
Purpose	Procedure	Observation
5. Check TAKEBACK	- Press MEMORY twice	- LCD shows 
		- H4 and MEMORY LED are ON
	- Press H4	- LCD shows as above
		- D8 and MEMORY LED are ON
	- Press D8	- LCD shows 
		- G4 and MEMORY LED are ON
	- Press CLEAR	- LCD shows 
6. Test finished	- Remove the adapter	- All LEDs are OFF
		- LCD is blanked

Table 1

Keypressed	LED ON	LCD shows
ENTER	A, 1, BOOK	— — — —
ENTER	B, 2, INFO	| | | |
ENTER	C, 3, MEMORY	| | | |
ENTER	D, 4, POSITION	— — — —
ENTER	E, 5, LEVEL	| | | |
ENTER	F, 6, FUNCTION	| | | |
ENTER	G, 7	— — — —
ENTER	H, 8	: :

Keypressed	LED ON	LCD shows
BOOK	All LEDs OFF	
INFO	As above	
MEMORY	As above	
POSITION	As above	
LEVEL	As above	
FUNCTION	As above	
ENTER	As above	
CLEAR	As above	

Note: A beep sound is emitted for each keypressed.