Atlanta

Saitek™

RT31

PROJECT	:	RT31 (Atlanta)
DOC. NO.	:	RT31-PG-010
REV.	:	0
DATE	:	18-July-97

GENERAL PRODUCT SPECIFICATIONS FOR ATLANTA

A.	Battery requirement	:	1.5 Volt (size 'AA' or 'AM-3') x 6 pcs Alkaline type recommended
B.	Adapter operating voltage range	: :	DC 8.0 ~ 13V (recommended to use 9V 300mA center positive adapter)
C.	Battery operating voltage	:	6.6 ~ 10.4 Volts
D.	Current consumption (at battery 9V)	:	10μA typical (max. 30μA) at STOP mode. 120mA typical (max. 150mA) at OPERATING mode.
E.	Power consumption	:	1.08W typical (at battery voltage = 9V) 1.35W max
F.	System clock frequency	:	At V. Batt = 9.0V 20MHz ±1% at U1 pin 74
G.	NMI clock frequency	:	At V. Batt = 9.0V 96KHz ±1% of U3 pin 9

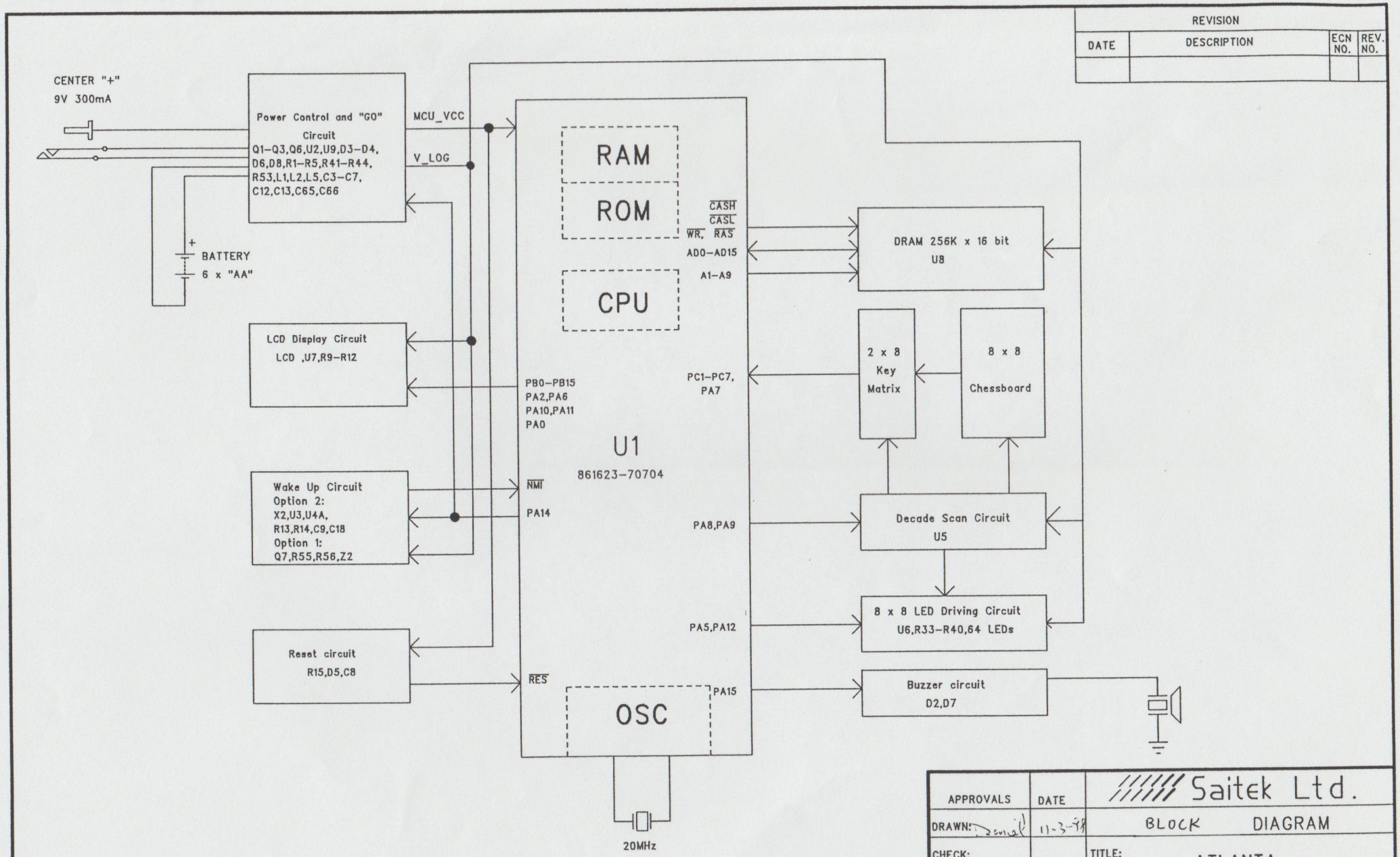
PREPARED BY : Eric Tse

APPROVED BY : BDM

DIST : BDM, QAM, SED, PE

Filename : /BDD/RT31-PS.Doc

REVISION			
DATE	DESCRIPTION	ECN NO.	REV. NO.



APPROVALS	DATE	Saitek Ltd.	
DRAWN: Daniel	11-3-98	BLOCK DIAGRAM	
CHECK:		TITLE: ATLANTA	
B.D.D.:	11.3.98	470	
Q.A.:	12.3.98	DWG. NO. RT31-PE-008	REV. 0

2/32

Dist: BDM, QAM, SED, PE

Project : RT31 (ALANTA)
Doc No. : RT31-PS-013
Rev. : 0
Date : 18-Sep-97

ADJUSTMENT PROCEDURE FOR ALANTA

Object : To adjust system clock frequency and NMI clock frequency.

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

System clock : At DC jack = 9.0V
20MHz ±1% at U1 pin 74

Procedure :

1. Disassemble the unit by removing 3 screws on bottom cabinet and one closed to battery door.
2. Power on the unit with voltage at DC jack input = 9.0V.
3. Place probe of counter/scope at pin 74 of U1.
   If frequency measured is out of specified range (19.8~20.2MHz), replace C1 or C2 until counter/scope reading is within specification.
4. Re-assemble the unit.

Prepared by : Daniel Fong

Approved by : BDM

Dist : QAM, SED, PE

Filename : /BDD/RT31-PS.Doc

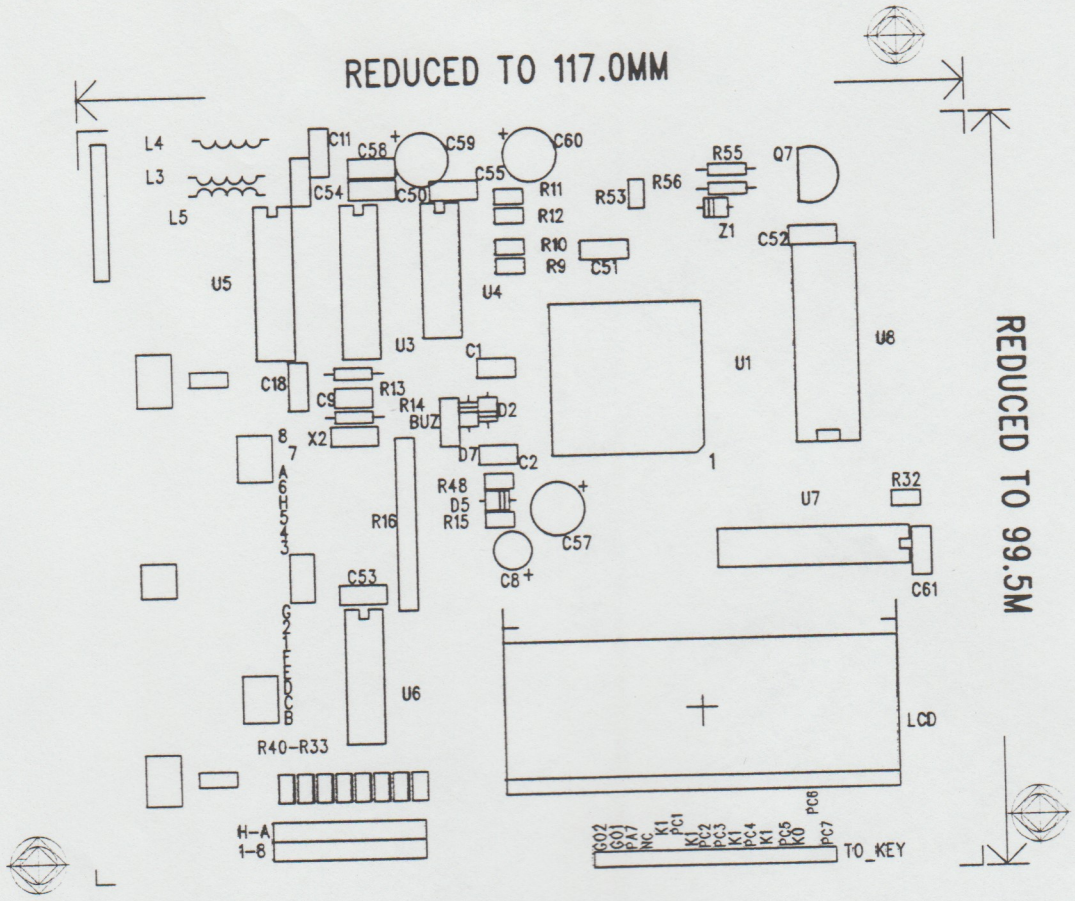
Atlanta Trouble Shooting Chart (RT31)

SYMPTOMS		POSSIBLE CAUSES
Unit cannot be turned ON	1.	Check if MCU_VCC within the range from 4.5V to 5.5V. If it is not within this range, check for : i) Adapter output within 8.0V-13.0V. ii) Broken connections in adapter wiring. iii) Open or shorted circuit in Ground and Vcc traces. iv) Check if ACL switch is shorted to Ground. v) Defective components in power supply circuit (i.e.Q1-Q3,U9)
	2.	Check for reset signal : Check for U1 pin 79 is logic 'HIGH'. If not, check if C8, R15, D5 are defective.
	3.	Check for power control signal:. Look for power control output from U1 pin 68 (ie logic high).
No sound	1.	Check for broken wirings from beeper to PCB.
	2.	Check if beeper is defective.
	3.	Check if D2, D7 are defective.
	4.	Check for pulse output from U1 pin 69 when 'SOUND ON'.
LCD missing segment or not turn on	1.	Check for broken or shorted traces on PCB
	2.	Check for loose contacts or misalignment between LCD and PCB.
	3.	Check for bad contacts in zebra connector.
	4.	Check if U7 is defective.
LED missing or turn on when it should not	1.	Check for broken or shorted traces on PCB.
	2.	Check if LED is defective.
	3.	Check if R33-R40, U5 and U6 are defective.
	4.	Check if U1 is defective.
No response or improper response to command keys or chessboard	1.	Check for loose contacts or misalignment between sensors and PCB traces.
	2.	Check for bad contacts in sensor connectors.
	3.	Check for broken or shorted traces on PCB or sensor.
	4.	Check for logic 'HIGH' at U1 pin 60, 88-90 and 92-95 when no key is pressed.
	5.	Check if R16-R23 are defective.
	6.	Check if U5 is defective.
	7.	Check if U1 is defective.

Daniel

No memory function	1. 2.	Check if batteries are dead or weak. Defective U1.
Excessive current drain (use adapter) Current > 150mA when 'ON' Current >20mA when 'MEMORY' or when battery is used: Current > 150mA when 'ON' Current >30uA when 'MEMORY'	1. 2. 3.	Check for component wirings or shorted traces on PCB. Check for contaminations and/or foreign particles on PCB. Check if U1 is defective.
Generates illegal moves	1. 2.	Check if batteries are exhausted. Check if U1 is defective.

Dist : BDM, QAM, PE

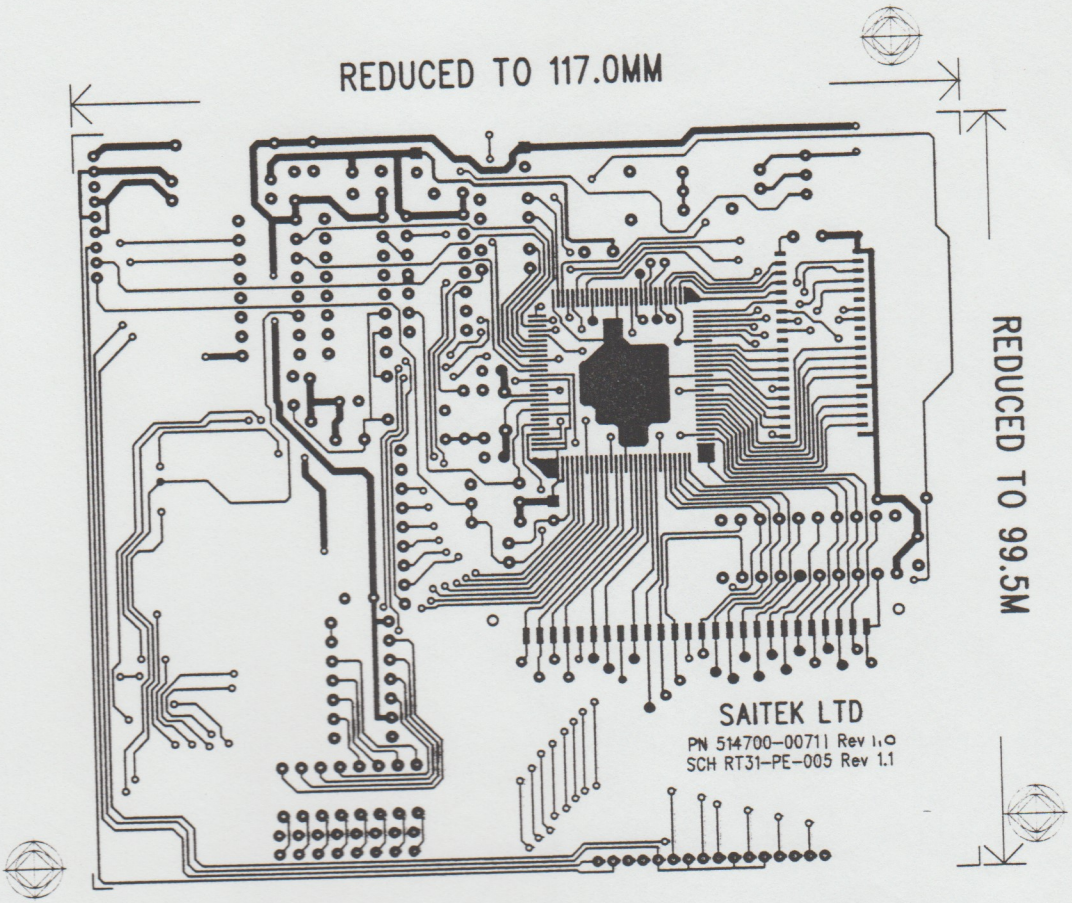


SAI TEK - SAI TEKK

0.1 1 See SCH Rev1.1

3RD ANGLE PROJECTION	SIGNATURE	DATE	REV.	ITEM	WAS / IS	DATE	DRAWN	CHECK	BDD	QA
					DESCRIPTION OF CHANGE				APPROVED	
TOLERANCES	DRAWN BY: Daniel	11/12/97	Saitek		TITLE: Logic PCB Silkscreen (comp. side)					
DIM.: ANGLE:	CHECK BY:									
SCALE: 1:1 UNIT: mm	ENGRG AUTH		DWG. NO.: RT31-PE-005		PROJECT: RT31					
QUANTITY:	Q.A. APPD.	13.12	P/N.: 5147001071 0							
SHEET 1 OF 5	BDD. APPD.	12.12.97	MATERIAL 1.6mm FR4		FINISH Golden Plated					

6/32



SAI TEK - SAI TEKK

3RD ANGLE PROJECTION	SIGNATURE		DATE	REV.	ITEM	WAS	IS	DATE	DRAWN	CHECK	BDD	QA
				0.1	1	see SCH Rev 1.1					APPROVED	
TOLERANCES	DRAWN BY:	Daniel	11/12/97	Saitek		DESCRIPTION OF CHANGE						
DIM.: ANGLE:	CHECK BY:											
SCALE: 1:1 UNIT: mm	ENGRG AUTH											
QUANTITY:	Q.A. APPD.		11.12.97									
SHEET 2 OF 5	BDD . APPD.		12-12-97									

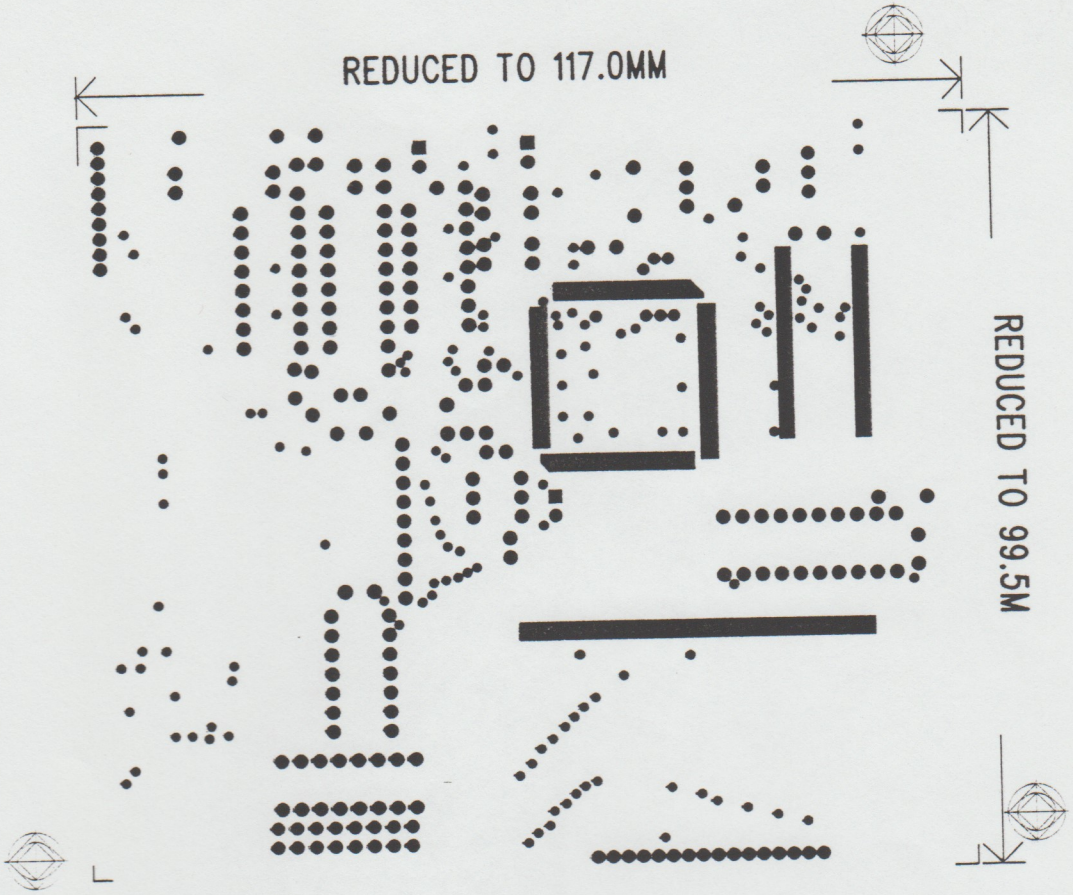
TITLE: LOGIC PCB Artwork (Comp SIDE)

DWG. NO.: RT31-PE-005 PROJECT: RT31

P/N.: 5147000-007101

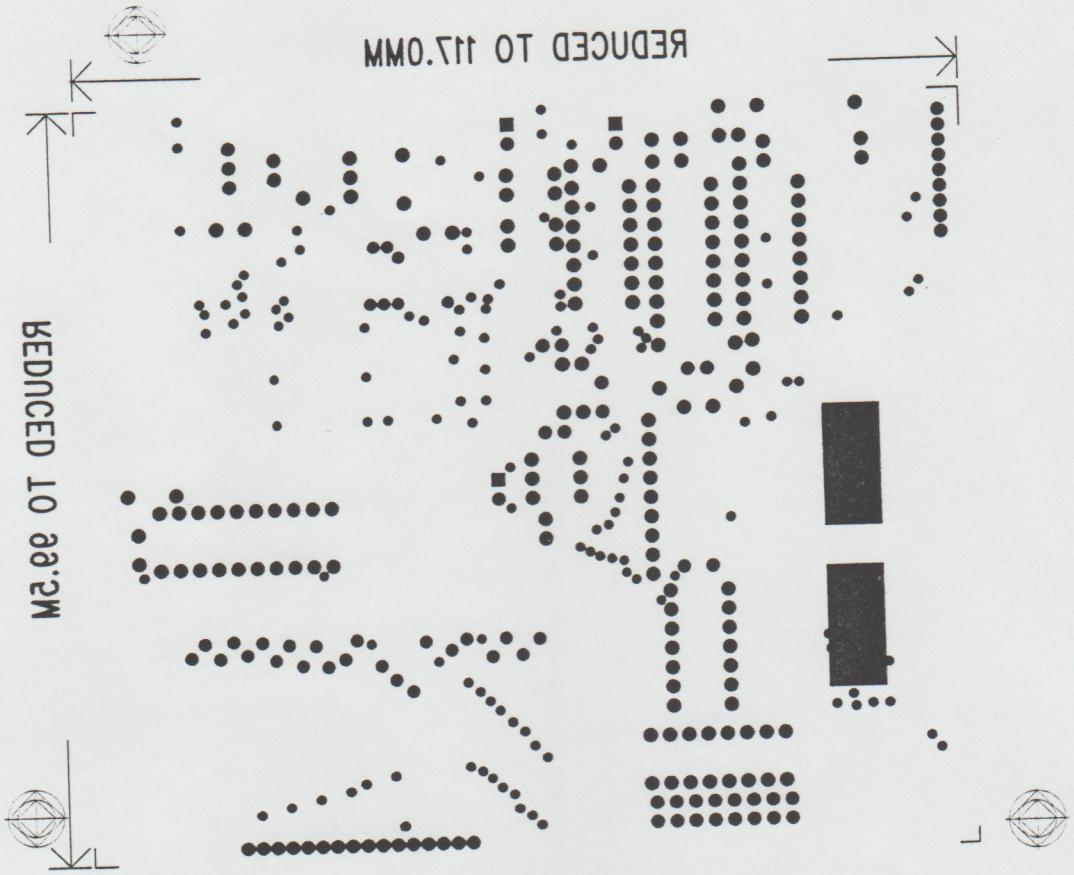
MATERIAL 1.6mm FR4 FINISH Golden Plated

SAI TEK - SAI TEKK



SAI TEK - SAI TEKK

				0.1	1	See SCH Rev 1.1						
3RD ANGLE PROJECTION	SIGNATURE		DATE	REV.	ITEM	WAS	IS	DATE	DRAWN	CHECK	BDD	QA
						DESCRIPTION OF CHANGE					APPROVED	
TOLERANCES DIM.: ANGLE:	DRAWN BY:	Daniel	11/12/97	Saitek		TITLE: LDGK PCB Solder mask (comp side)						
	CHECK BY:											
SCALE: 1:1 UNIT: mm	ENGRG AUTH			DWG. NO.: RT31-PE-005				PROJECT: RT31				
QUANTITY:	Q.A. APPD.		15/12	P/N.: 514700-0071 0								
SHEET 4 OF 5	BDD. APPD.		12.12.97	MATERIAL 1.6mm FR4						FINISH Golden Plated		

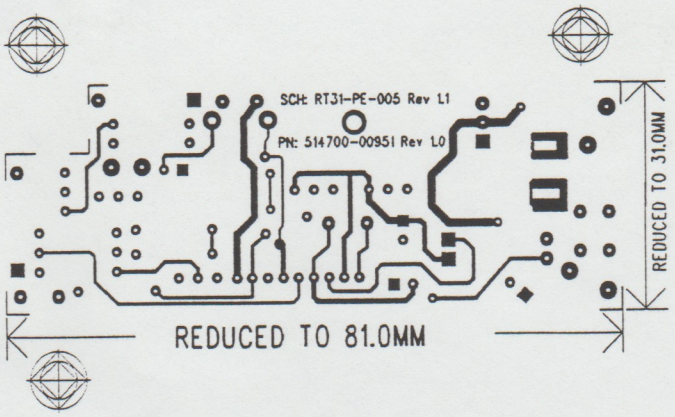


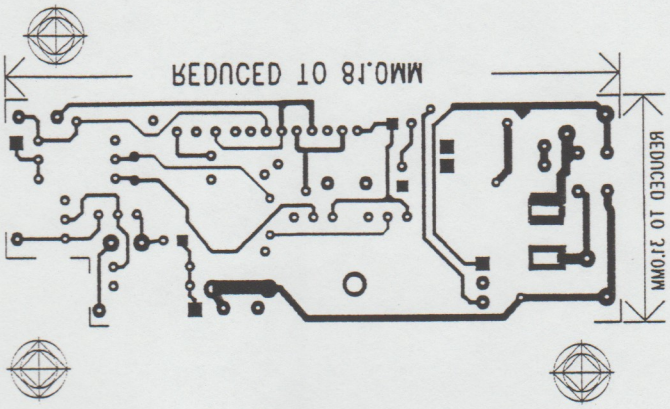
SAI TEK - SAI TEKK

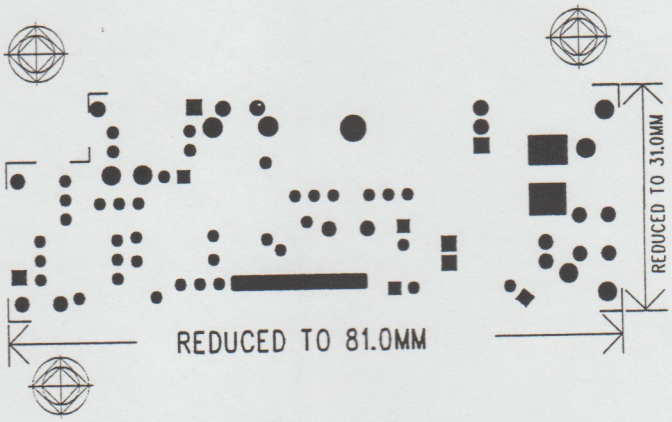
See SCH
REV 1.1

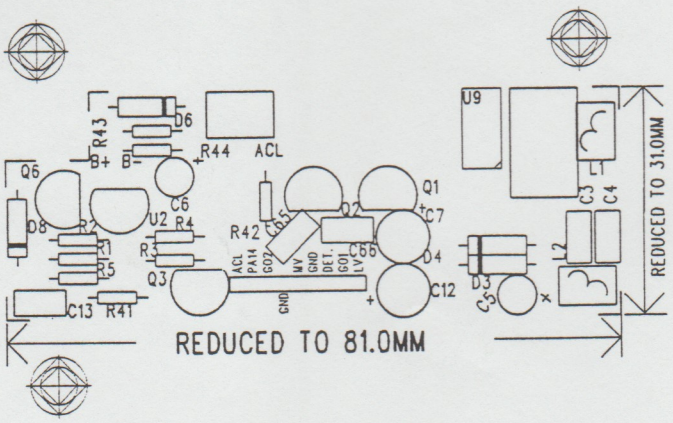
3RD ANGLE PROJECTION	SIGNATURE		DATE	REV.	ITEM	WAS / IS	DATE	DRAWN	CHECK	BDD	QA
				0.1	1	DESCRIPTION OF CHANGE				APPROVED	
TOLERANCES DIM.: ANGLE:	DRAWN BY:	Daniel	11/12/97	Saitek		TITLE: LOGIC PCB solder mask (Solder side)					
	CHECK BY:										
SCALE: (:) UNIT: mm	ENGRG AUTH			DWG. NO.: RT31-PE-005				PROJECT: RT31			
QUANTITY:	Q.A. APPD.		15.12	P/N.: 5,1,4,7,0,0,-,0,0,7,1,0,							
SHEET 5 OF 5	BDD. APPD.		12-12-97	MATERIAL 1.6 mm FR4				FINISH Golden Plated			

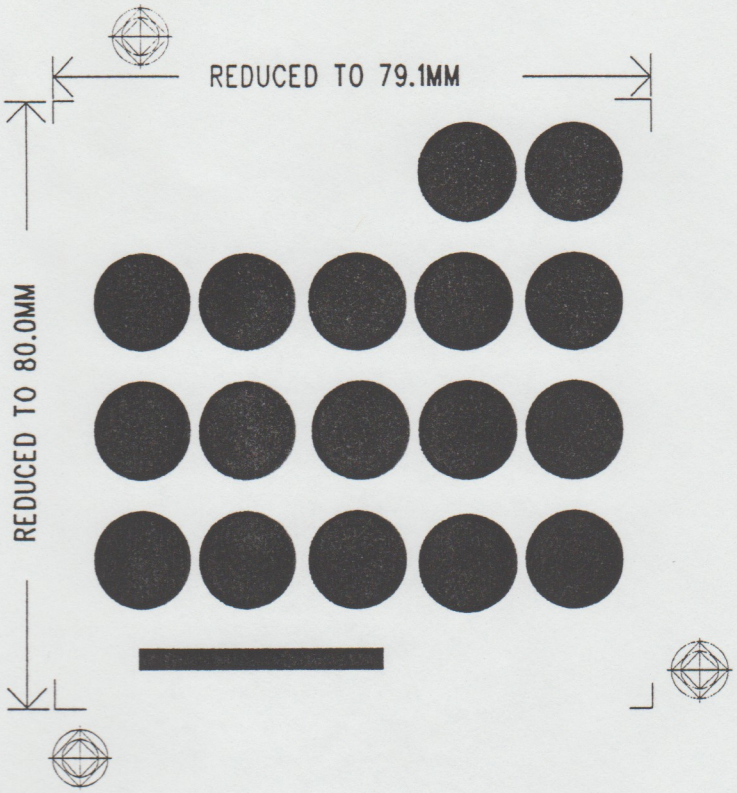
10/32

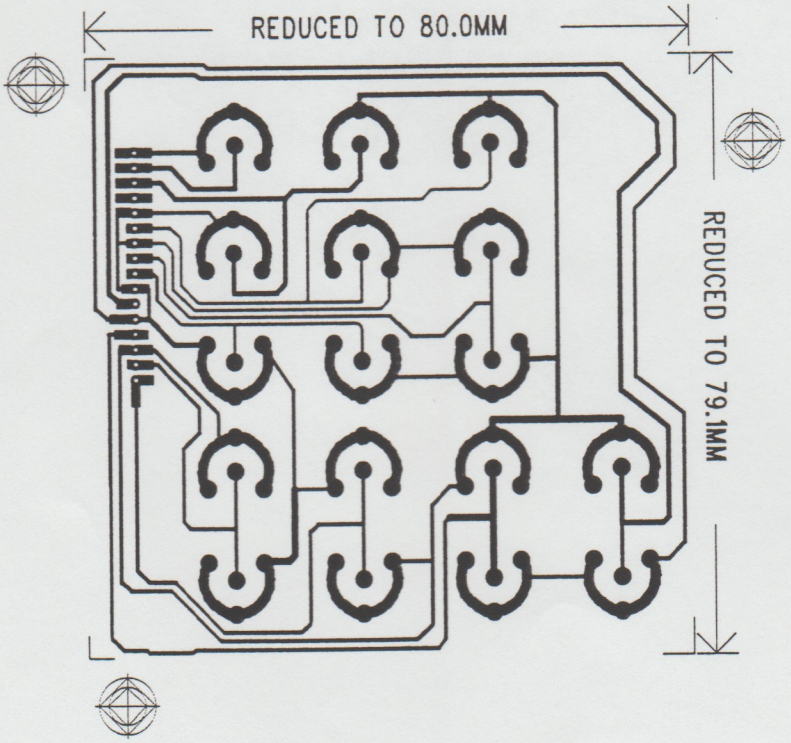

SCH: RT31-PE-005 Rev L1
PN: 514700-00951 Rev L0
REDUCED TO 31.0MM
REDUCED TO 81.0MM

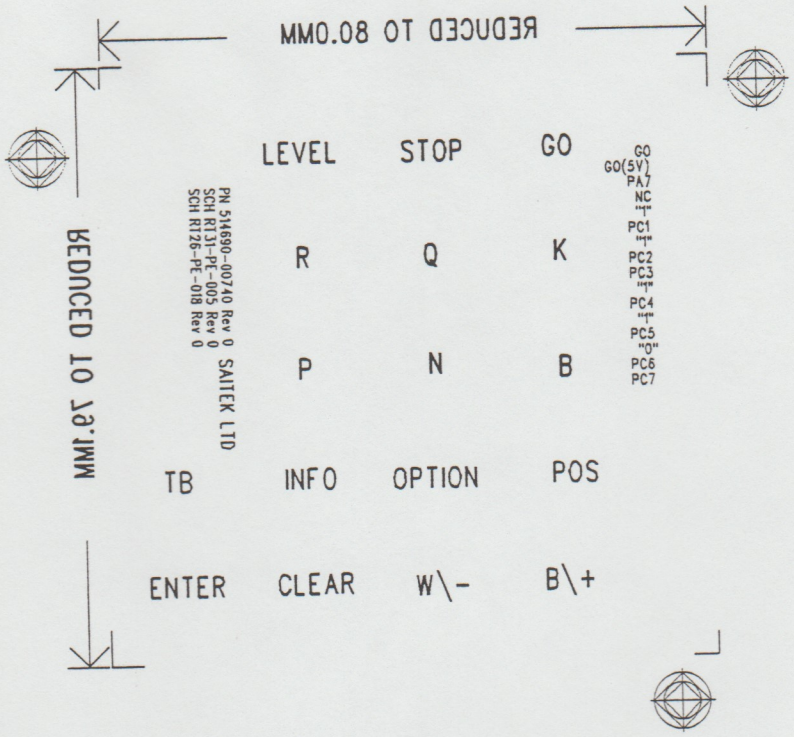

REDUCED TO 31.0MM
REDUCED TO 81.0MM

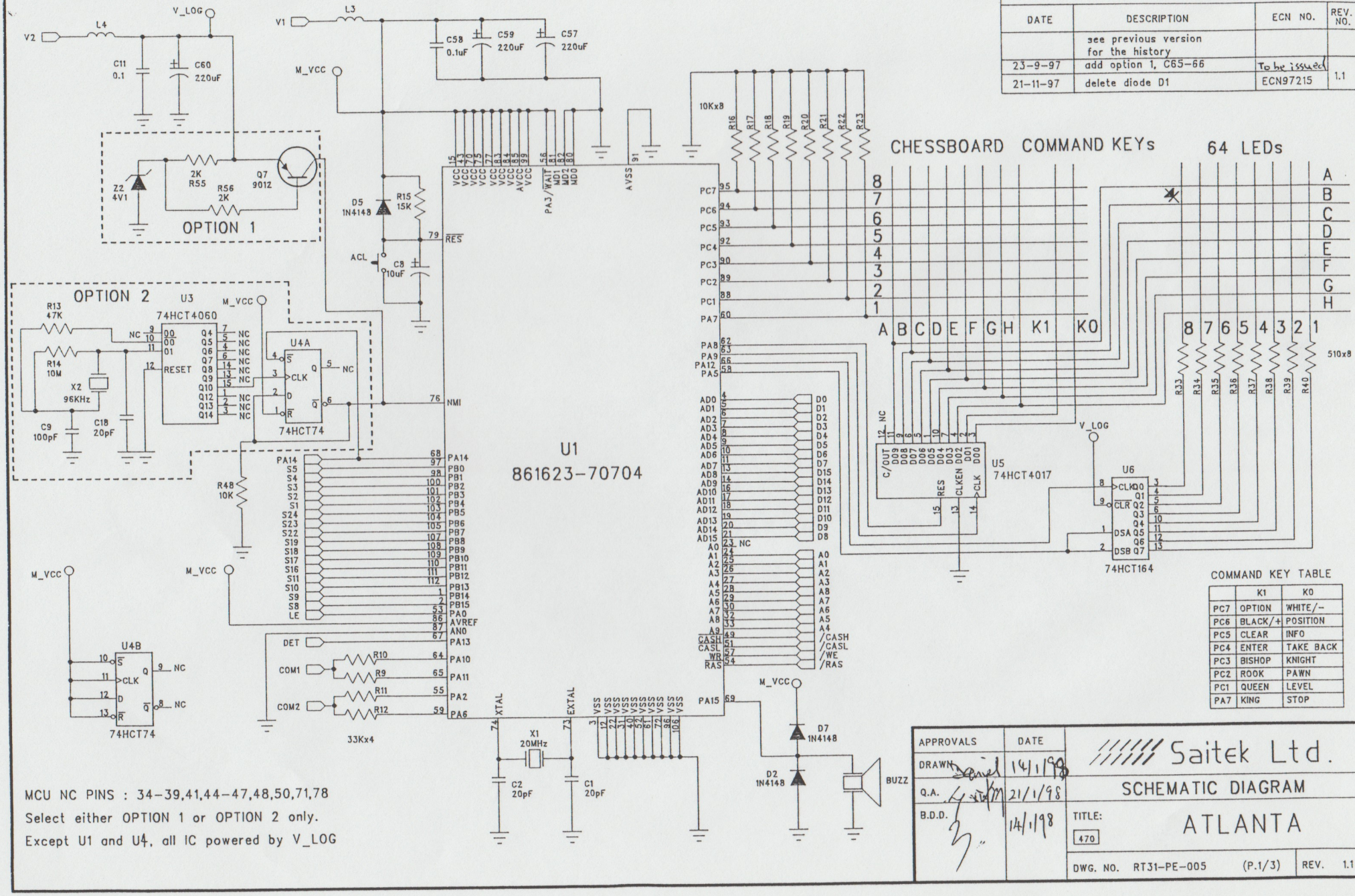

REDUCED TO 31.0MM
REDUCED TO 81.0MM


U9
D6
R43
R44
ACL
B+
B-
Q6
D8
R2
R1
R5
C6
U2
R4
R3
Q3
R42
C6.5
Q2
Q1
C7
C6
D4
C12
C3
C4
L2
D3
C5
C13
R41
ACL
PA14
GO2
MV
GND
DET
GO1
LV
GND
REDUCED TO 31.0MM
REDUCED TO 81.0MM


REDUCED TO 79.1MM
REDUCED TO 80.0MM


REDUCED TO 80.0MM
REDUCED TO 79.1MM


REDUCED TO 80.0MM
REDUCED TO 79.1MM
LEVEL
STOP
GO
R
Q
K
P
N
B
TB
INFO
OPTION
POS
ENTER
CLEAR
W\-
B\+
PN 514690-00740 Rev 0
SCH R131-PE-005 Rev 0
SCH R126-PE-018 Rev 0
SAITEK LTD
GO
GO(5V)
PA7
NC
PC1
PC2
PC3
PC4
PC5
"0"
PC6
PC7



REVISION			
DATE	DESCRIPTION	ECN NO.	REV. NO.
	see previous version for the history		
23-9-97	add option 1, C65-66	To be issued	1.1
21-11-97	delete diode D1	ECN97215	

COMMAND KEY TABLE

	K1	K0
PC7	OPTION	WHITE/-
PC6	BLACK/+	POSITION
PC5	CLEAR	INFO
PC4	ENTER	TAKE BACK
PC3	BISHOP	KNIGHT
PC2	ROOK	PAWN
PC1	QUEEN	LEVEL
PA7	KING	STOP

MCU NC PINS : 34-39,41,44-47,48,50,71,78

Select either OPTION 1 or OPTION 2 only.

Except U1 and U4, all IC powered by V_LOG

APPROVALS	DATE
DRAWN Daniel	14/1/98
Q.A.	21/1/98
B.D.D.	14/1/98

Saitek Ltd.

SCHEMATIC DIAGRAM

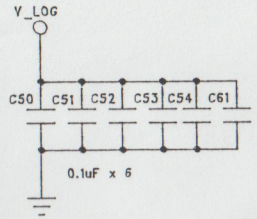
TITLE: ATLANTA

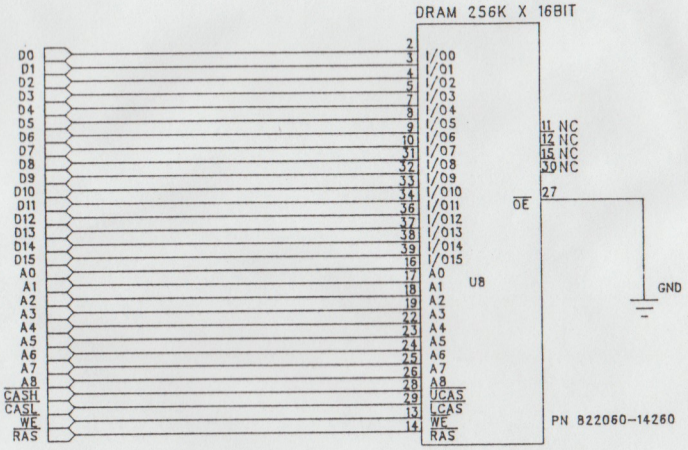
470

DWG. NO. RT31-PE-005 (P.1/3) REV. 1.1

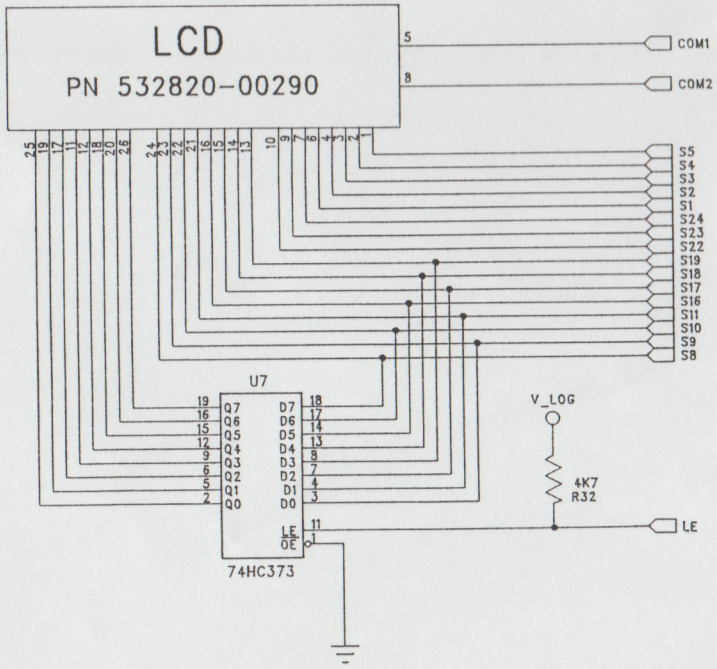
DIST: BDM,QAM,SED,PE

REVISION				
DATE	DESCRIPTION	ECN	NO.	REV. NO.





U8 pin 1,6,20 connects to V_LOG
pin 21,35,40 connects to GND

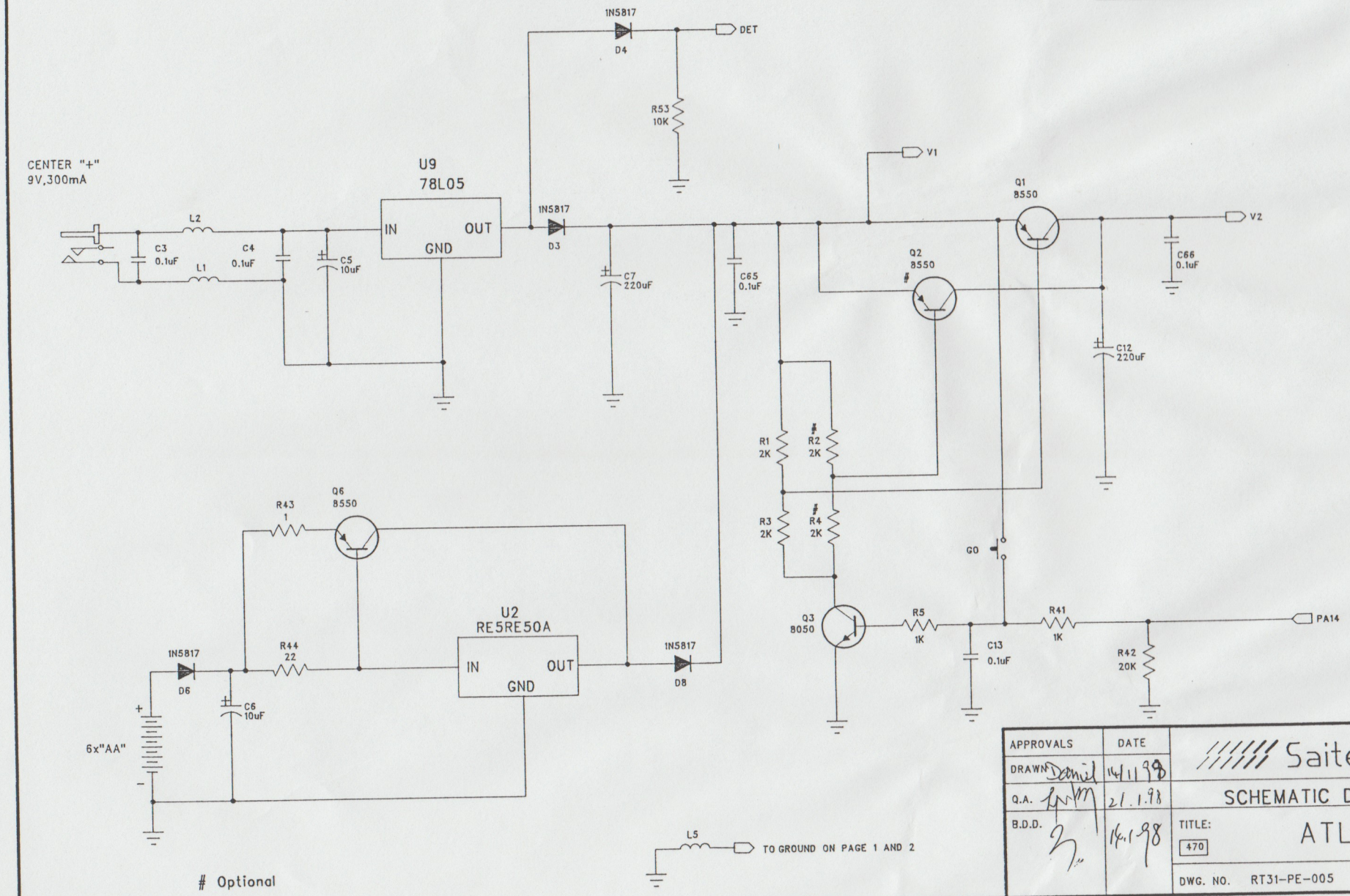


APPROVALS	DATE	Saitek Ltd.
DRAWN Daniel	14/1/98	SCHEMATIC DIAGRAM
Q.A.	21.1.98	
B.D.D.	14.1.98	TITLE: ATLANTA
		470
		DWG. NO. RT31-PE-005 (P.2/3) REV. 1.1

DIST: BDM,QAM,SED,PE

N/32

REVISION			
DATE	DESCRIPTION	ECN NO.	REV. NO.



APPROVALS	DATE	Saitek Ltd.
DRAWN Daniel	14/11/98	SCHEMATIC DIAGRAM
Q.A.	21.1.98	TITLE: ATLANTA
B.D.D.	14.1.98	470
		DWG. NO. RT31-PE-005 (P.3/3) REV. 1.1

DIST: BDM,QAM,SED,PE

16/9

SAITEK

BILL OF MATERIALS

PROJECT	:	RT31	Atlanta
ART.NO.	:	470	
REVISION	:	1	BDD#/RT31.Doc

REVISION HISTORY

REVISION	DATE	BY	DESCRIPTION OF CHANGES
P1	02.01.97	Leon Wong	Preliminary BOM.
P2	01.05.97	Leon Wong	Change power PCB and components; change connector for LED board to use connector array; logic guts components update.
1	17.10.97	Leon Wong	Update logic guts and power guts for RFI and circuit improvement per ECN97155. Add rubber rod per ECN97145. Change to use make up instead of ZTAT.

RELATED DOCUMENTS	REV
Schematic dwg : RT31-PE-005	0.1

Prepared By : Leon
Leon Wong

Approved by : BDM

Distribution :
+1.00 [X] MMM,FAM,SED; QAM
+0.10 [ ] MMM,FAM,SED; QAM

Date issue : 21 OCT 1997

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

994700 - RT31, ATLANTA Rev : 1

Level	Item	Chg	Stock Code	Rev	Cons	Description	Qty Per	Reference
1			984700-00000	1		UNIT ASSEMBLY,FOR RT31	1.000	
2			914700-00001	1		GUTS ASSEMBLY - LOGIC,RT31	1.000	
3	1	*	514700-00711		RC	PCB,LOGIC,D.S,1.6MM FR4,RT31	1.000	ECN97155
3	2		514700-00710		RC	PCB,LOGIC,D.S,1.6MM FR4,RT31	.000	RUNNING CHANGE
3	3	*	861623-70704		RC	MICROPROCESSOR,RT31,FP	1.000	ECN97155
3	4		870024-47034		RC	ZTAT,MICROCOMPUTER,HD6477034F20,HITACHI	.000	U1,ALTERNATIVE
3	5		41EPR			EPROM 27C256 PROGRAMMING	.000	ZTAT PROGRAM'G
3	6		741775-04017		RC	TTL,-4017,DECADE COUNTER/DRIVER,HCT	1.000	U5
3	7		750013-04017		RC	IC,DECADE COUNTER/DRIVER,4017	.000	ALTERNATIVE,U5
3	8		740065-00164		RC	TTL,-164,8 BIT S/P SHIFT REGISTER,HCT	1.000	U6
3	9		741723-00373		RC	TTL,-373, 8 BIT LATCH, HC, DIP20	1.000	U7
3	10		822060-14260		RC	DRAM,HY514260,256KX16,60NS,CMOS,SOJ	1.000	U8
3	11		642000-03130		RC	CRYSTAL,20MHZ,30PPM	1.000	X1
3	12		642000-03250		RC	RESONATOR,20MHZ,50PPM	.000	X1,ALTERNATIVE
3	13		654148-10000		RC	DIODE,SWITCHING,1N4148	3.000	D2,D5,D7
3	14		611035-22109		RC	RESISTOR,ARRAY,C-FILM,10KX8,5%,1/8W,9	1.000	R16-R23
3	15		611035-21102		RC	RESISTOR,FIXED,C-FILM,10K,5%,1/8W	2.000	R48,R53
3	16	NW	612025-31102		RC	RESISTOR,FIXED C-FILM,2K,5%,1/4W	2.000	R55,56 ECN97155
3	17		613335-21102		RC	RESISTOR,FIXED C-FILM,33K,5%,1/8W	4.000	R9-R12
3	18		611535-21102		RC	RESISTOR,FIXED C-FILM,15K,5%,1/8W	1.000	R15
3	19		614725-21102		RC	RESISTOR,FIXED C-FILM 4K7 5%,1/8W	1.000	R32
3	20		615115-21102		RC	RESISTOR,FIXED C-FILM,510,5%,1/8W	8.000	R33-R40
3	21	NW	670290-12GB0		RC	TRANSISTOR,PNP,9012G,CENTRE B	1.000	Q7, ECN97155
3	22	NW	650000-33915		RC	DIODE,ZENER,3V9,+/-5%,1/4W	1.000	Z2,ECN97155
3	23		622000-05014		RC	CAPACITOR,C-CAP NPO,20PF,+/-20%,50V	2.000	C1,C2 ECN97155
3	24		621047-01611		RC	CAPACITOR,C-CAP,0.1UF,+80-20%,16V	7.000	C11,C50-C54,C58
3	25		621047-01611		RC	CAPACITOR,C-CAP,0.1UF,+80-20%,16V	1.000	C61
3	26		621067-01615		RC	CAPACITOR,E-CAP,10UF,+80-20%,16V	1.000	C8
3	27		622277-01015		RC	CAPACITOR,E-CAP,220UF,+80,-20%,10V	3.000	C57,C59,C60
3	28		630007-20000		RC	INDUCTOR,RFI,140H,+/-10%,Q=44MIN	3.000	L3-L5,ECN97155
2			914700-00002	1		GUTS ASSEMBLY - LED,RT31	1.000	
3	29		514490-00320		RC	PCB,LED,SS,1.6MM,PAPER PHENOLIC,FOR RT8	1.000	
3	30		660001-11003		RC	LED,RED,DOME,D=3MM,TOSHIBA,TLR124	64.000	
3	31		000051-25155		RC	JUMPER,L=12.5MM,LL=15MM,D=0.5MM	44.000	ECN97155
3	32		000030-01060		RC	CONNECTOR ARRAY,N=21,L=150,E=3.5,P=2.54	1.000	2 X 8 PINS
2			914690-00004	1		GUTS ASSEMBLY - KEYBOARD,RT26/RT31	1.000	
3	33		514690-00740		RC	PCB,KEYBOARD,S.S,1.6MM P.P,RT26/31	1.000	
3	34		000011-00100		RC	ACL,RESET CONTACT,D=10MM,STAINLESS STEEL	17.000	ECN96225
3	35		000030-00900		RC	CONN ARRAY,N=18,L=100MM,P=2.0MM,E=3.5MM	1.000	
3	36		294690-02000		RC	SPACER,0.3MM PVC WITH D.S.TAPE,RT26	1.000	ECN96225
2			914700-00005	1		GUTS ASSEMBLY - POWER,RT31	1.000	
3	37		000030-01290		RC	CONN ARRAY,N=9,L=210MM,P=2MM,E=3.5MM	1.000	
3	38	*	514700-00951		RC	PCB,POWER,D.S,1.6MM FR4,RT31	1.000	ECN97155
3	39		514700-00950		RC	PCB,POWER,D.S,1.6MM FR4,RT31	.000	RUNNING CHANGE
3	40		611025-31102		RC	RESISTOR,FIXED C-FILM,1K,5%,1/4W	2.000	R5,R41
3	41		612025-31102		RC	RESISTOR,FIXED C-FILM,2K,5%,1/4W	2.000	R1,R3
3	42		612025-31102		RC	RESISTOR,FIXED C-FILM,2K,5%,1/4W	.000	OPTIONS:R2,R4

994700 - RT31, ATLANTA Rev : 1

Level	Item	Chg	Stock Code	Rev	Cons	Description	Qty Per	Reference
3	43		612035-31102		RC	RESISTOR,FIXED C-FILM,20K,5%,1/4W	1.000	R42
3	44		611035-31102		RC	RESISTOR,FIXED C-FILM,1,5%,1/4W	1.000	R43
3	45		612205-31102		RC	RESISTOR,FIXED C-FILM,22,5%,1/4W	1.000	R44
3	46		622277-01015		RC	CAPACITOR,E-CAP,220UF,+80,-20%,10V	2.000	C7,C12
3	47		621067-01615		RC	CAPACITOR,E-CAP,10UF,+80-20%,16V	2.000	C5,C6
3	48	+2	621041-01611		RC	CAPACITOR,C-CAP,0.1UF,+/-20%,16V	5.000	C3,4,13,65,66
3	49		670285-50DB0		RC	TRANSISTOR,PNP,8550,D,CENTRE B	2.000	Q1,Q6
3	50		670285-50DB0		RC	TRANSISTOR,PNP,8550,D,CENTRE B	.000	OPTIONS:Q2
3	51		670180-50CB0		RC	TRANSISTOR,NPN,8050,C,CENTRE B	1.000	Q3
3	52		690037-RE50A		RC	ELECT,REGULATOR,5V,120MA,TO-92,RE5RE50AC	1.000	U2
3	53		655817-34015		RC	DIODE,SCHOTTKY,1N5817,20 TO 40V,1A	4.000	D3,D4,D6,D8
3	54		654148-10000		RC	DIODE,SWITCHING,1N4148	1.000	D1
3	55		690018-7805F		RC	ELECT,REGULATOR,5V,TO-220F,NJM7805FA	1.000	U9
3	56		630007-20000		RC	INDUCTOR,RFI,14UH,+/-10%,Q=44MIN	2.000	L1,L2
3	57		524690-01110		RC	SWITCH,TACT,RT26,TS-1225-BS	1.000	
3	58		000220-00003		RC	SOCKET,DC POWER JACK,DC 208	1.000	ECN96225
2			964700-00000	1		CASING ASSEMBLY,FOR RT31	1.000	
3	59		314690-00400		RC	SENSOR,CHESSBOARD,COMBO,RT26/31	1.000	
3	60		324490-00610		RC	OVERLAY,FOR RT31,CHESSBOARD,COMBO,LEXAN	1.000	
3	61		224490-00700		RC	METAL PLATE,213.3X202.2MM,W/D TAPE,HOLES	1.000	
3	62		354470-01900		RC	INLAY,FOR T.COVER,METAL W/PVC,BLK,RT6/8	2.000	
3	63		344700-00200		RC	NAME PLATE,PVC,ATLANTA,SILKSCREEN,RT31	1.000	
3	64		354690-00800		RC	INLAY,FOR JACK,PVC,BLACK,RT26/31	1.000	
3	65		224470-02500		RC	METAL,B-CONT.'-',BRONZE,NI-PLT,RT6	1.000	
3	66		224470-02600		RC	METAL,B-CONT,"+",BRONZE,NI-PLT,RT6	1.000	
3	67		224470-02700		RC	METAL,B-CONT,"+",BRONZE,NI-PLT,RT6	2.000	
3	68		532820-00290		RC	LCD,FOR ST12	1.000	
3	69		000090-00320		RC	FOAM PAD,52X25X6MM	1.000	
3	70		250000-00525		RC	ZEBRA CONNECTOR,SG,51.4X2.4X8.2MM	1.000	
3	71		215120-02503		RC	PLASTIC,SENSOR CLAMP,LARGE,PC,CLEAR	1.000	ECN96284
3	72		214210-03500		RC	PLASTIC,LOCK PIN,NYLON 66,WHITE	1.000	
3	73	NW	250000-00150		RC	RUBBER ROD,48X2.9X2.8MM,COMPRESS KE951U	1.000	ECN97145
3	74		000130-00270		RC	BUZZER,D=27MM	1.000	
3	75		000073-11434		RC	SCREW,S/T,+BIND,M2.6X8MM,A	7.000	KEY PCB MOUNT
3	76		000073-11434		RC	SCREW,S/T,+BIND,M2.6X8MM,A	8.000	LOGIC PCB MOUNT
3	77		000073-11434		RC	SCREW,S/T,+BIND,M2.6X8MM,A	2.000	POWER PCB MOUNT
3	78		000073-11434		RC	SCREW,S/T,+BIND,M2.6X8MM,A	11.000	LED PCB MOUNT
3	79		000073-41434		RC	SCREW,S/T,+CSK,HD,M2.6X8MM,A	3.000	BOTTOM CABINET
3	80		000073-12434		RC	SCREW,S/T,+BIND,M2.6X8MM,BT	1.000	BATT.COMPART'M
3	81		000021-00140		RC	RUBBER FT,3M/MIG.FREE,D30.5X1.6MM,ADHE.	4.000	
3	82		000062-10043		RC	STRAND WIRE,RED,L=100MM,E=3.5MM,AWG28	1.000	B+
3	83		000060-21043		RC	STRAND WIRE AWG28,E=3.5MM,L=210MM,BLACK	1.000	B-
3	84		000061-10043		RC	STRAND WIRE,BROWN,L=100MM,E=3.5MM,AWG28	2.000	BUZZER
3			954700-00000	1		CABINET SET,FOR RT31	1.000	
4	85		214690-00310		RC	PLASTIC,TOP COVER,HIPS,SPRAY BLACK	1.000	
4	86		214470-01600		RC	PLASTIC,INNER PLATE,HIPS,BLACK	1.000	
4	87		214690-00200		RC	PLASTIC,T.CAB,HIPS,SPY.BLACK,SILKSCREEN	1.000	
4	88		214690-00300		RC	PLASTIC,BOTTOM CABINET,HIPS,BLACK	1.000	
4	89		214470-00740		RC	PLASTIC,BATT.DOOR,HIPS,SPY.BLACK,S.SCRN	1.000	

19/32

994700 - RT31, ATLANTA Rev : 1

Level	Item	Chg Stock Code	Rev	Cons	Description	Qty Per	Reference
4	90	214470-00800		RC	PLASTIC,KNOB KEY,ABS,BLACK	17.000	
1		944700-10000	1		PACKING ASSEMBLY,FOR RT31	1.000	
2	91	454490-01000		RC	INSERT,FOR RT5/6/8,MAIN BODY,CORR.PAPER	1.000	
2	92	454490-01010		RC	INSERT,FOR RT5/6/8,TOP COVER,CORR.PAPER	1.000	
2	93	494470-02400		RC	REMARK SHEET,FOR RT6/RT8	15.000	
2	94	360000-00240		RC	LABEL,FOR SERIAL NO,ADHESIVE PAPER H+G	1.000	
2	95	000124-50310		RC	POLYBAG,450X310X0.045MM	1.000	FOR UNIT
2	96	462910-10600		RC	ACCESSORY,POUCH,FOR SA9 CHESSMEN	1.000	
2	97	454700-00400		RC	CARTON,FOR RT31,5PCS/CTN	.200	
2		244690-30800	1		CHESSMEN SET,RT26/31,199+203	1.000	
3	98	262050-00151		RC	CHESSMEN,YO1C,16,GLOSSY BLACK,RUB MAG	1.000	
3	99	262050-10151		RC	CHESSMEN,YO1C,16,GLOSSY BLACK,RUB MAG	.000	ALTERNATIVE
3	100	262050-00111		RC	CHESSMEN,YO1C,16,LIGHT GREY,RUB MAGNET	1.000	
3	101	262050-10111		RC	CHESSMEN,YO1C,16,LIGHT GREY,RUB MAGNET	.000	ALTERNATIVE
1		974700-00000	1		OPTIONS ASSEMBLY,FOR RT31	1.000	
2	102	334700-00300		RC	RATING PLATE,FOR RT31,PVC,H&G	1.000	
2	103	424700-61100		RC	GIFTBOX,FOR RT31,E/G/F/D/S/I,SWL	1.000	
2	104	414700-02100		RC	MANUAL,FOR RT31,GERMAN,H&G	1.000	
2	105	414700-53200		RC	MANUAL,FOR RT31,E/D/F/S/I,H&G	.000	
2		490000-00000	1		CONSUMER LEAFLET LISTING ASSEMBLY	1.000	
3	106	430016-01006		RC	LEAFLET,CONSUMER,1995,ENGLISH,SWL	1.000	ENG. COUNTRIES
3	107	430017-02007		RC	LEAFLET,CONSUMER,1995,GERMAN,SWL	.000	GERMAN
3	108	430021-01004		RC	LEAFLET,CONSUMER,1994,ENGLISH,DIXONS	.000	DIXONS
2		490000-00010	1		WARRANTY CARD LISTING ASSEMBLY	1.000	
3	109	430004-51000		RC	CARD,WARRANTY,E/G/F/D/S,SWL,CHESS	1.000	CHESS PRODUCT
3	110	430008-51000		RC	CARD,WARRANTY,E/G/F/D/S,SWL,NON CHESS	.000	NON-CHESS
3	111	430064-02000		RC	CARD,GUARANTEE,SCHNEIDER,G	.000	SCHNEIDER
3	112	430048-01003		RC	CARD,GUARANTEE,E,CONTEMPORARY GAMES	.000	CCC
3	113	430113-02001		RC	CARD,GUARANTEE,GERMAN,H&G	.000	GERMAN & AUST.
3	114	370000-09200		RC	CARD,COM#92,GUARANTEE,TRANSECOM	.000	TRANSECOM
3	115	430120-01000		RC	CARD,WARRANTY,ENGLISH,SCI	.000	SCI
3	116	430162-02000		RC	CARD,GUARANTEE CARD,FOR H+G,PCP,GERMAN	.000	
3	117	430165-01000		RC	CARD,GUARANTEE,FOR SP,PCP,ENGLISH	.000	
2		490000-00020	1		RULE OF CHESS LISTING ASSEMBLY	1.000	
3	118	430156-01000		RC	BOOK,RULES OF CHESS,ENGLISH,SWL	1.000	
3	119	430157-03000		RC	BOOK,RULES OF CHESS,FRENCH,SWL	.000	
3	120	430158-46000		RC	BOOK,RULES OF CHESS,G/D/I/S,SWL	.000	
2		370000-00000	1		LABEL ASSEMBLY	1.000	
3	121	370000-00104		RC	LABEL,COM#1,FOR SWL,ENGLISH,CE LABEL	.000	ECN-96049
3	122	370000-00103		RC	LABEL,COM#1,FOR SWL,ENGLISH,CE LABEL	.000	RUNNING CHANGE
3	123	370000-19801		RC	LABEL,FOR ALL PRODUCTS EXC.PCP TO FRANCE	.000	ECN-97122
3	124	370000-19800		RC	LABEL,COM#198,MADE IN CHINA,TRANSECOM	.000	ECN97122,USE-UP
3	125	370000-18200		RC	LABEL,MADE&PRINTED IN CHINA,ADHESIVE	.000	ECN 96235
3	126	370000-20100		RC	STICKER,COM#201,"AGES 8 AND UP"	.000	

20/32

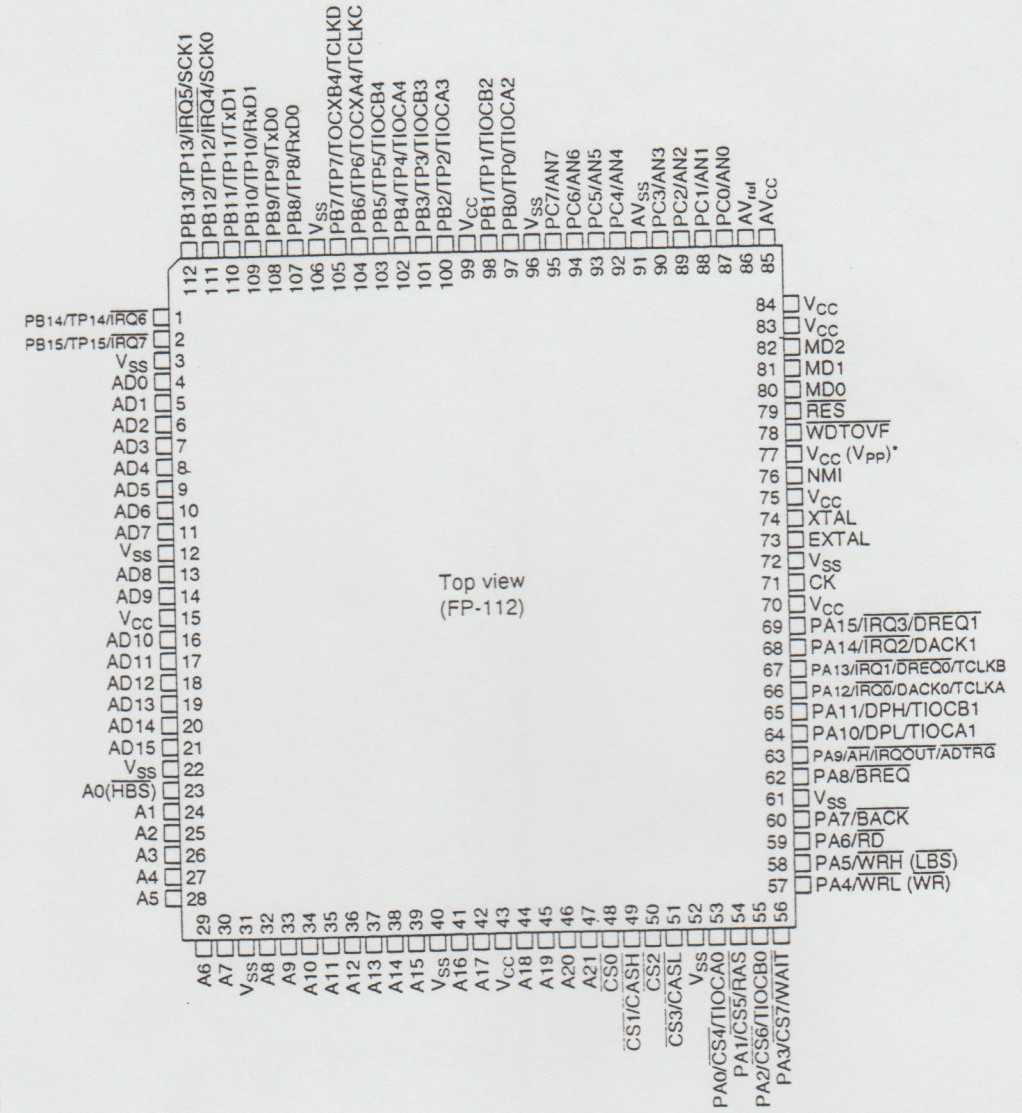
994700 - RT31, ATLANTA Rev : 1

Level	Item	Chg Stock Code	Rev	Cons	Description	Qty Per	Reference
3	127	370000-01001		RC	LABEL,COM#10,FOR OTTO GIFTBOX	.000	OTTO
3	128	370000-01100		RC	LABEL,COMMON,NO:11,FOR PLATETIME BOX	.000	PLATETIME
3	129	370000-01200		RC	LABEL,COMMON,NO:12,FOR SEARS,CAN	.000	SEARS
3	130	370000-01300		RC	LABEL,COMMON,NO:13,DICK SMITH ON BOX	.000	DICK SMITH
3	131	370000-07600		RC	STICKER,COM#78,GREEN POINT,GERMAN,20MM	.000	GERMAN
3	132	370000-08600		RC	ADDENDUM,COM#86,FOR ALL,RECYCLE,QUELLE	.000	QUELLE
3	133	430063-01000		RC	ADDENDUM,E,FOR SUKL SHIPMENT,HELP LINE	.000	SYSTEMA
3	134	370000-11204		RC	ADDENDUM,DISTRIBUTORS LIST 97,ENGLISH	.000	ECN97066
3	135	370000-14100		RC	STICKER,COM#141,FOR L'WOODS CARTON,PAPER	.000	L'WOODS QTY=3
3	136	370000-17500		RC	STICKER,COM#175,TOY SYMBOL	.000	FOR NO TOY SYMB
3	137	370000-04900		RC	STICKER,COM#49,GREEN POINT,GERMAN LARGE	.000	
3	138	430026-01004		RC	CARD,ACCESSORY ORDER,E,SCI	.000	SCI,CHESS ONLY
3	139	430100-61000		RC	ADDENDUM,ADAPTOR WARNING,E/G/F/D/S/I	.000	ECN 95199
3	140	370000-15900		RC	ADDENDUM,COM#159,TOY SYMBOL,H+G	.000	ECN 95201
3	141	370000-20200		RC	STICKER,COM#202,USCF,FOR CHESS TO SCI	.000	
3	142	430123-01000		RC	CARD,USCF,FOR CHESS PRODUCTS TO SCI,E	.000	
3	143	370000-20400		RC	STICKER,H&G HOTLINE ON BACK OF UNIT	.000	GERMAN
3	144	430124-02000		RC	ADDENDUM,INFO FOR CHESS,GERMAN,H&G	.000	GERMAN (CHESS)
3	145	370000-21000		RC	STICKER,COM#210,RECYCLE PAPER,3 SUISSES	.000	ECN-96109
3	146	370000-21100		RC	STICKER,COM#211,ADDRESS LABEL,FOR SEARS	.000	ECN-96161
3	147	370000-21800		RC	ADDENDUM,COM#218,BAT.WARNING,E/F/G/D/S/I	.000	ECN-97119

21/32

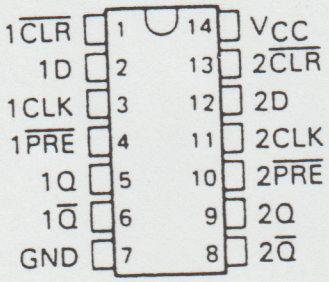
RT31

u1



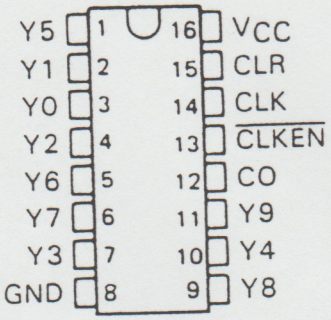
Note: V_{CC}: SH7032, SH7034 (Masked ROM version)V_{PP}: SH7034 (PROM version)

(TOP VIEW)



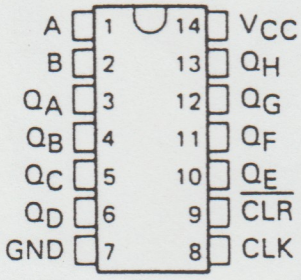
U4

(TOP VIEW)



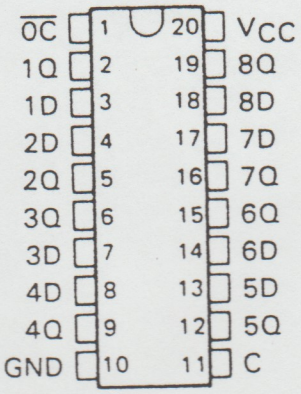
U5

(TOP VIEW)



U6

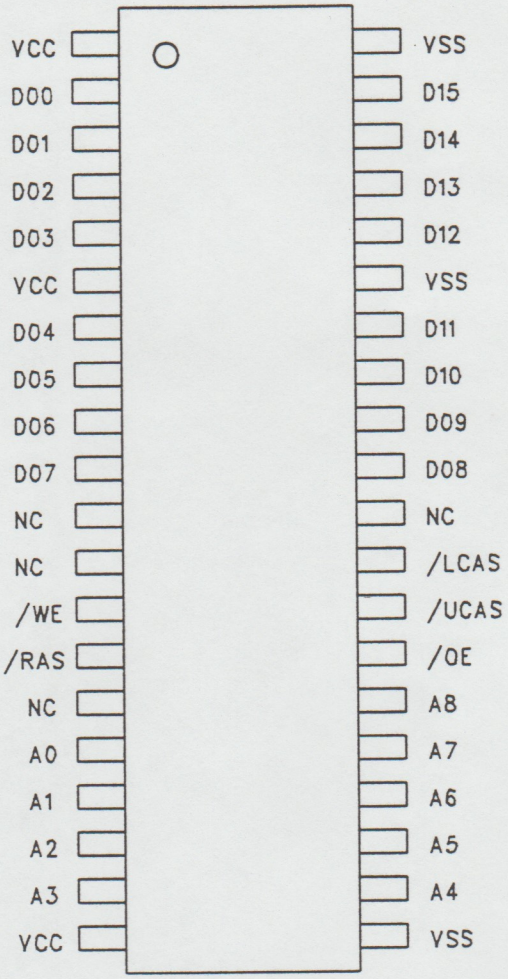
(TOP VIEW)



U7

RT31

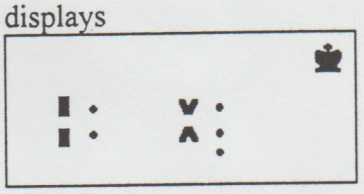
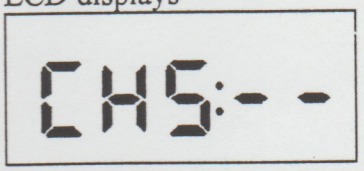
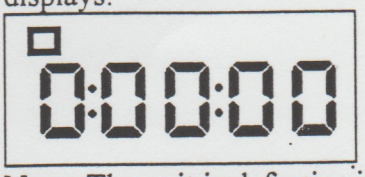
U8

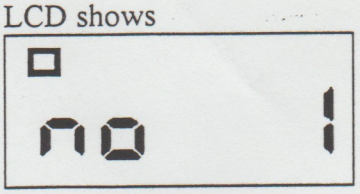
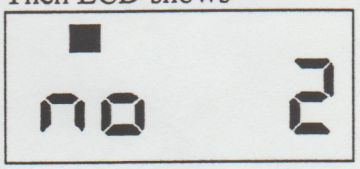
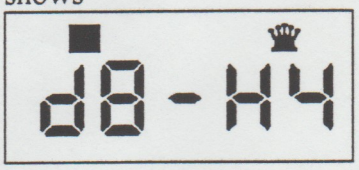
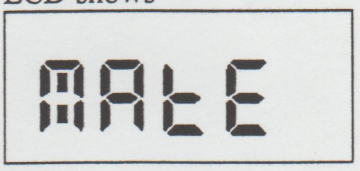
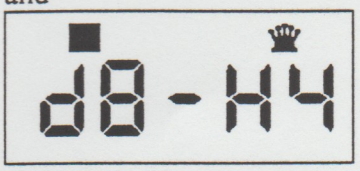

VCC
D00
D01
D02
D03
VCC
D04
D05
D06
D07
NC
NC
/WE
/RAS
NC
A0
A1
A2
A3
VCC
VSS
D15
D14
D13
D12
VSS
D11
D10
D09
D08
NC
/LCAS
/UCAS
/OE
A8
A7
A6
A5
A4
VSS

24/32

8. FUNCTIONAL TEST PROCEDURE FOR RT31

Insert six AA size batteries into the battery compartment.

Purpose	Procedure	Observation
1. QC test mode	- Press ACL	
	- Press ♞ and ♟ simultaneously while LED/LCD scanning	- A single beep sound is emitted - LCD and LED scanning as Table 1 - H8 LED is on and LCD displays 
2. Function keys and chessboard square test	- Press function key as Table 2	- See Table 2
	- Press 64 chessboard square	- LCD displays  ("— —" = corresponding square coordinate) and corresponding square LED are turned on steadily with beep sound
3. Reset	- Press ACL	- LCD and LED scanning as Table 1 (1-8) and then LCD displays:  Note: The unit is defective if LCD displays "Err 0", "Err A" or "Err E" during power up

Purpose	Procedure	Observation
4. Multimove	- Press **TAKEBACK** key	- LCD shows 
	- Press square **F2, F4, E7, E5, G2, G4** in sequences	- Corresponding coordinate LED (F2, E7 or G2) turn on with a beep sound for each keypress and LCD shows the corresponding move
		- Then LCD shows 
	- Press **CLEAR**, then **ENTER**	- D8 LED are on and LCD shows 
	- Press **D8**	- H4 LED are on and LCD shows as above
	- Press **H4**	- LCD shows  and  alternately (for about 16 seconds), then white clock is displayed

Purpose	Procedure	Observation
5. Auto power off test	- Press **OPTION, WHITE/-** then **ENTER, CLEAR**	- Clock counts up and after about 50 sec., "+apd" is flashing on LCD for about 10 sec. then unit is turned off
	- Press **GO**	- White clock is displayed on LCD
	- Press **OPTION WHITE/-** then **ENTER, CLEAR**	- Same as above
6. Check adapter batteries	- Press **STOP**	- LCD turns off
	- Insert non-energized adapter into DC jack	
	- Press **GO**	- Same as before STOP key is pressed
	- Press **STOP**	- LCD turns off
	- Replace the non-energized adapter with energized adapter (9V 300mA center positive)	
	- Press **GO**	- Same as before STOP key is pressed.
7. Check adapter input	- Press **STOP**	- LCD turns off
	- Remove the batteries from the compartment	
	- Press **GO**	- Same as before STOP key is pressed

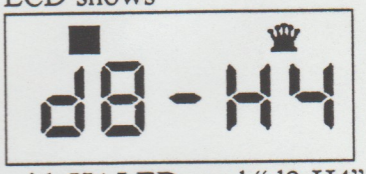
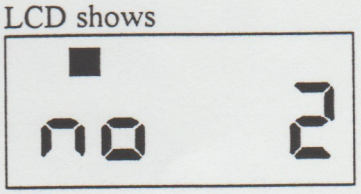
Purpose	Procedure	Observation
8. Check high/low voltage	- Press STOP	- LCD is turned off
	- Insert a battery tester to battery compartment with output voltage of the tester sets to 10.4V	
	- Remove the 9V adapter from the unit	
	- Press GO	- LCD displays same as before STOP key is pressed
	- Press STOP	- LCD is turned off
	- Set the output voltage of the tester to 6.6V	
	- Press GO	- LCD display same as before STOP key is pressed
9. Check memory	- Press **TAKEBACK** then **WHITE / -**	- LCD shows  with H4 LEDs and "d8-H4" are flashing
	- Press **H4**	- LCD same as above without flashing and D8 LEDs are ON
	- Press **D8**	- LCD shows 
10. Test Finished	- Remove the battery tester from the unit	- All LEDs and LCD are off

Table 1

Sequence	LCD shows	Row / LED to be ON
1		A1 - A8
2		B1 - B8
3		C1 - C8
4		D1 - D8
5		E1 - E8
6		F1 - F8
7		G1 - G8

Sequence	LCD shows	Row / LED to be ON
8		H1 - H8
9	tESt	H8
10		A1 - A8
11		B1 - B8
12		C1 - C8
13		D1 - D8
14		E1 - E8

Sequence	LCD shows	Row / LED to be ON
15		F1 - F8
16		G1 - G8
17		H1 - H8

Note : the unit is defective if LCD displays “Err 0” or “Err A” or “Err E” during power up.

Table 2

Function key pressed	LED on
LEVEL	E1
♔	H2
♕	G2
♖	F2
♗	E2
♘	D2
♙	C2
POSITION	F1
OPTION	D1
INFO	G1
TAKEBACK	A1
BLACK / +	B2
WHITE / -	A2
CLEAR	C1
ENTER	B1

* LCD is blank in function key test.
* A beep sound is emitted for each function key press.