ATARI HOME COMPUTER

FIELD SERVICE MANUAL

400/800 PAL AND UK

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INTRODUCTION

The ATARI 400/800 Home ComputerTM Field Service Manual is organized in 10 Sections:

- 1 THEORY OF OPERATION overview of how the 400 and 800 Home Computers work.
- 2 SILKSCREENS AND SCHEMATICS electrical layouts and drawings for major components.
- 3 TESTING AND TROUBLESHOOTING overview of tests which assist in diagnosing malfunctions.
- 4 DISASSEMBLY/ASSEMBLY detailed instructions to completely disassemble and assemble both units.
- 5 400 DIAGNOSTIC FLOWCHARTS detailed procedures for troubleshooting and repairing the 400 Computer.
- 6 400/800 SYMPTOM CHECKLIST quick reference for troubleshooting each computer.
- 7 800 DIAGNOSTIC FLOWCHART detailed procedures for troubleshooting and repairing the 800 Computer.
- 8 GAME CONTROLLERS overview of hand controller construction with electrical schematics and recommended test procedures.
- 9 PARTS LIST detailed breakdown of all parts used in each unit.
- 10 SERVICE BULLETINS section to be used to hold Field Change Orders, Upgrade Bulletings, and Tech Tips.

This manual is designed for use by both the experienced and inexperienced service technician. The Diagnostic Flowcharts (Section 5 and 7) provide detailed diagnostics and repair procedures for technicians not completely familiar with the ATARI 400/800 Home Computers. The Symptom Checklist (Section 6) provides a rapid repair reference for the more experienced technician.

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SECTION I

THEORY OF OPERATION

OVERVIEW

The Atari 400 Computer Home Console contains the central processor unit (CPU) and memory in the form of the Operating System (read-only-memory (ROM)) and 8K or 16K of user programmable random access memory (RAM). The console contains the keyboard, cartridge slot, controller jacks, and serial input/output (I/O) port for connecting peripheral devices (see Figure 1-1).



Figure 1-1. ATARI 400 Home Computer Console

1-1

The ATARI 800 Home Computer Console contains the CPU and memory in the form of the Operating System (10K of read-only-memory (ROM)) and 8K to 16K (standard) of user programmable random access memory (RAM); plus two expansion sockets for additional RAM modules (maximum 48K). The console also contains the keyboard, cartridge slots (2), controller jacks and a serial I/O port for connecting peripheral devices (see Figure 1-2).



Figure 1-2. ATARI 800 Home Computer Console

USER INTERFACE

The ATARI 400/800 Home Computer Consoles are general purpose microcomputers using the 6502 microprocessor. The ATARI 400/800 Consoles are the central processing units for their respective systems. Each console comes standard with a built-in typewriter style keyboard, 8K/16K of RAM, ROM operating systems, connector jacks for adding peripherals and hand controllers, and a 15-foot Radio Frequency (RF) cable for connection to the user's television set.

The controller jacks on the front of both consoles accepts the X-Y (joystick) and paddle hand controllers available from ATARI.

The right side panel of the Atari 400 Computer Console contains a peripheral jack, power ON/OFF switch, and a power jack. The channel 2/3 switch is located on the back of the console. This switch changes the console transmission frequency to either channel 2 or channel 3 (refer to Figure 1-1).

The right side panel of the Atari 800 Home Console contains a monitor jack, a peripheral jack, a channel 2/3 switch, a power ON/OFF switch, and a power jack (refer to Figure 1-2). Note that the 800/UK version does not use the channel 2-3 select switch; and the numbers have been removed.

Both Console keyboards provide a full alphanumeric character set, cursor controls, and special purpose keys. The alphabet keys when used in conjunction with the Control (CTRL) key become special graphic symbols. To the right of the keyboard is the power ON light and four special control keys (refer to Figure 1-1 and Figure 1-2). From the top to the bottom they are:

SYSTEM RESET	-	Interrupts whatever the computer is doing and restarts the Operating System or Program Cartridge.
OPTION	-	Interrupt used by the Program Cartridge to choose among the variations within a game or program.
SELECT	-	Interrupt used to select one of several games or programs on the Program Cartridge.
START	-	Interrupt used to Start the game or program selected from the Program Cartridge.

400/800 MECHANICAL DESCRIPTION

The Atari 400/800 Computer Home Consoles are made up of seven major functional modules they are:

- o Motherboard
- o Central Processing Unit Printed Circuit Board
- o ROM Personality Printed Circuit Board (Operation System) (800 Only)
- o RAM Printed Circuit Board(s)
- Keyboard
 - o Power Supply Board
- Sile US
 - o Program Cartridge

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The Printed Circuit Boards (PCBs) plug into sockets on the motherboard, using a common Address Bus, Data Bus and clock lines. The various power requirements are routed from the power supply through the motherboard to all printed circuit boards.

The keyboard connects directly to the motherboard through a ribbon connector. The sixteen-line Address Bus allows the microprocessor to directly address 64K of memory. The eight-line Data Bus provides the communication and data path between the functional modules.

Figures 1-12 thru 1-21 at the end of this section provide function block diagrams of PCBs in the 400/800 systems.

Motherboard

The motherboard ties all components of the computer system together. It also performs a variety of logic functions. All PCBs and connector cables plug into the motherboard and allow communication between the functional blocks of the 400 and 800 Computer Consoles. The motherboard also performs the following:

- o Generates a 3.54 MHz master clock for the Central Processing Unit's PCB.
- o Generates the Power-ON RESET for the Central Processing Unit PCB and the peripherals.
- o Provides the driving circuitry for the Key-Press signal from the Central Processing Unit PCB to the Console speaker.
- o Converts signals from the various hand controllers into recognizable data for the microprocessor.
- o Buffers and drives the data lines between the Central Processing Unit PCB, the RAM PCBs, and the remainder of the system.
- o Does the first memory map decoding of the possible 64K address locations into 8K blocks for the microprocessor.
- o Generates control signals for the peripheral devices.
- o Receives video data from the Central Processing Unit PCB, converts it into a composite video and routes it to the power supply PCB.
- o Combines the sound from the Computer system and the audio track of prerecorded cassettes.
- o Develops the sound subcarrier for the television audio as part of the composite video.

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Central Processing Unit

The Central Processing Unit (CPU) PCB is the controller of the entire Console system. The CPU PCB contains the 6502 microprocessor, and the ANTIC and CTIA (or GTIA) chips. The CPU PCB controls the Console system and its peripheral devices through address lines (to select which device it needs to communicate with) and data lines (to transmit and/or receive data from a selected device) common to the entire system. Operating instructions for the microprocessor come from the ROM Operating System on the Personality PCB. Additional functions of the CPU PCB are:

- Receives the master clock from the motherboard and generates Phase 1 (01 or Ph 1) and Phase 2 (02 or Ph 2) clocks used to synchronize the entire system.
- o Transmits a REFRESH signal at least every 2 miliseconds to refresh the dynamic RAM chips on the RAM PCB(s).
- o Receives the four TRIGGER lines from the fire button on each of the hand controller accessories.
- o Receives the lines from the four control switches located to the right of the keyboard.
- o Generates video signals to be processed by the motherboard before they are sent to the RF module on the Power Supply PCB.

ROM Personality PCB

The ROM Personality PCB contains information in Read-Only Memory (ROM), the program of operating instructions for the microprocessor. Two 4K ROMs contain the Operating System, and one 2K ROM contains the arithmetic functions used for BASIC programming. Information is retrieved from the ROMs by addressing a particular location on the ROM using the Address Bus. The data contained at that location is placed on the Data Bus to be read by the microprocessor.

The ROM Personality PCB also provides the CHIP SELECT signals used to select LSI chips throughout the Console system and for the bi-directional data buffers on the motherboard.

RAM PCB

The Random Access Memory (RAM) PCB performs the function of temporary data storage for the system. The RAM is dynamic, requiring REFRESH, and is available in 8K or 16K versions.

Each RAM chip on the RAM PCB has only seven address lines. To address 16K separate locations requires 14 address lines. To accomplish this, a 14-bit address is

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sent to the address demultiplexer, which first passes the lower seven bits to the RAM chips as a Row Address. After an appropriate delay, the highest seven bits are passed as a Column Address. Data is then either put into or taken out of the location selected. The direction of data flow is determined by the Read/Write line.

REFRESH occurs at least every two milliseconds. The REFRESH signal is generated on the CPU Board.

Keyboard

The typewriter-style keyboard is used to generate alphanumeric characters as well as special graphic symbols. The keyboard allows the operator to communicate with the console system for writing programs or responding to preprogrammed cassettes or cartridges. The keyboard consists of 57 normally open switches. The switches are scanned at a rapid rate and when a switch is found closed, that scan pattern is sent to the microprocessor for encoding.

Power Supply

The Power Supply PCB receives 9VAC from an external power adaptor (transformer) and provides +5Vdc, +12Vdc, and -5 Vdc for the Console system. The Power ON/OFF switch is mounted on the Power Supply PCB and removes input power by opening the 9Vac lines. An interlock switch breaks power to the system when the operator opens the top panel of the Console to install or remove Program Cartridges.

The RF Module resides on the Power Supply PCB. The RF Module generates the RF output for the video screen from the composite video signals received from the motherboard, and is switchable to television channel 2 or 3.

Voltages:

+5Vdc A - Supply voltage for the logic PCBs.

+5Vdc B - Specially filtered for the video circuitry.

+12Vdc and -5 Vdc - Supply voltage for the dynamic RAM chips.

The UK 400/800 uses UHF on Channel 36 and the RF modulator is on the top of the power supply board (see Figures 1-3 and 1-4). The RF cable (CAO16294) is also different (required) to handle the higher RF.



Figure 1-3. UK 400 Power Supply



Figure 1-4 UK 800 Power Supply

Program Cartridge

The Program Cartridge permanently stores the microprocessor instructions for a particular application. It consists of two 4K ROM chips mounted on the enclosed PCB. Information is received from the ROM chips by addressing the memory locations assigned to the Program Cartridge slot(s). Data in the memory locations is then placed on the Data Bus lines.

400/800 ELECTRONIC DISCUSSION

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The remainder of this section provides a detailed discussion of the functions of the seven major modules.

Central Processing Unit

The Central Processing Unit (CPU) PCB contains the 6502 CPU (or MPU) chip (A303), the CTIA or GTIA chip (A301), the ANTIC chip (A302), tri-level address buffers (Z303 and Z304), and the clock generator (Z302A and Z302B).

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CPU Board

The 800/PAL CPU board has the most changes, (see Figures 1-5 thru 1-6). One 74LS244 (C014313) and one 74LS02 (C014340-301) chip have been removed from the board and a 4.433618 MHz (C012284-Y301) has been added to develop the color delay on PAL CPU Board.

The following IC's are also changed:

Location	Domestic	PAL & UK	Description
A303	CO14377	CO14806	The domestic 6502 operates at 2.0 MHz, and the PAL & UK 6502 operates at 3.0 MHz. The increased speed is required to operate within PAL & UK television standards.
A301	CO14805	CO14889	A special PAL and UK version.
A302	C012296	CO14887	A faster version for PAL and UK version.



Figure 1-5. 800 PAL/CPU Board

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CPU 6502 Integrated Circuit

The 6502 microprocessor contains register flags, interconnections, arithmetic logic, and control logic, all recognized operation codes. The characteristics of the 6502 microprocessor are:

- o Byte-oriented structure
- o 151 opcodes
- o Decimal and binary arithmetic modes
- o Seven addressing modes
- o True indexing
- o Stack pointer
- o Two interrupt levels
- o 64K address range
- o Integral clock circuit
- o Single +5 volt dc power requirement

Figure 1-6 is an illustration of the 6502 pin assignments. The functions of the pins are explained on the following pages.

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Figure 1-6. MPU Pin Assignments

Alphanumeric Television Interface Controller

The primary function of the Alphanumeric Television Interface Controller (ANTIC) chip is to fetch data from memory, independent of the processor, for display on the video screen.

Figure 1-7 is an illustration of ANTIC Pin Assignments.

GROUND CTIA Data CTIA Data Light Pen CTIA Data Interrupt Input Interrupt Output Refresh HALT Address Bus Address Bus Address Bus Read/Write Ready Address Bus Address Bus Address Bus Address Bus Address Bus Address Bus	VSS ANØ AN1 LP AN2 RNM1 NM1 REF HALT A3 A2 A1 AØ R/W RDY A10 A12 A13 A14	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	• ANTIC	40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22	D4 D5 D6 D7 RES FPhØ D3 D2 D1 DØ Ph2 A4 A5 A6 A7 A8 A9 A11	Data Bus Data Bus Data Bus Data Bus Data Bus Reset Fast Phase 0 Clock Phase 0 Clock Data Bus Data Bus Data Bus Data Bus Phase 2 Clock Address Bus Address Bus Address Bus Address Bus Address Bus
Address Bus	A13	18		23	A9	Address Bus
Address Bus	A14	19		22	A11	Address Bus
Address Bus	A15	20 L		21	VDD	5V Power

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Figure 1-7. ANTIC Pin Assignments

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Color Television Interface Adaptor

The Color Television Interface Adaptor (CTIA) chip retrieves graphics data from memory via the ANTIC DMA process. This data is routed to the CTIA graphics registers. Figure 1-8 illustrates the pin assignments for the CTIA and GTIA.

Address Bus Address Bus Ground Data Bus Data Bus Data Bus Data Bus Trigger 0 Trigger 1 Trigger 2 Trigger 3	A1 AØ VSS D3 D2 D1 DØ TØ T1 T2 T3	1 2 3 4 5 6 7 8 9 10 11	стіа	40 39 38 37 36 35 34 33 321 31 30	A2 A3 A4 D4 D5 D6 D7 R/W CS1 CS2 PH2 FD40	Address Bus Address Bus Address Bus Data Bus Data Bus Data Bus Data Bus Read/Write Chip Select 1 Chip Select 2 Phase 2 Input
Data Bus	DØ	7		34	D7	Data Bus
Trigger 0	TØ	8		33	R/W	Read/Write
Trigger 1	T1 -	9		321	CS1	Chip Select l
Trigger 2	T2	10	CTIA	31	CS2	Chip Select 2
Trigger 3	T3	11		30	PH2	Phase 2 Input
Console Sw 0	SØ	12		29	FPHO	Clock OUt
Console Sw 1	S 1	13		28	OSC	Oscillator Input
Console SW 2	S2	14		27		Power
Console SW 3	S3	15		26	HALT	HALT
PAL Colr Delay	PAL	16		25	CSYNC	Output Sync
Color Delay	DEL	17		24	LUM 2	Luminance 2 Output
Alphanum. Data 0	AN0	18		23	LUM 1	Luminance 1 Output
Alphanum. Data 1	ANI	19		22	LUM Ø	Luminance 0 Output
' Alphanum. Data 2	AN2	20		21	COL	Color

Figure 1-8. CTIA/GTIA Pin Assignments

Graphics Television Interface Adaptor

The Graphic Television Interface Adaptor (GTIA) is an extended capabilities version of the CTIA, having additional high-resolution modes.

Motherboard Console - 400

The 400 Console Motherboard contains the Pot Keyboard (POKEY) chip (A101), the Peripheral Interface Adaptor Chip (PIA) (A102), the ROM Personality chips (A103 thru A105), the Keyboard Key-In/Key-Out analog multiplexers, the Memory Map Decoder (Z103), the controller jacks (J101 thru J104), the CPU connector jack (J110), the Keyboard connector jack, RAM connectors and Cartridge connectors. The following parts are changed on the motherboard (Figure 1-9 illustrate chip placement on the 400.)

<u>Location</u>	Domestic	PAL & UK	Description
A103	CO14599	CO15299	Custom Rom "F"
A104	CO12499	CO15199	Custom ROM "E"
L102	2.Ouh	.82 uh	Audio indicator, changed from 2.0 uh to .82 uh to accommodate the different subcarrier used by PAL and UK versions.
X101	3.57 MHz	3.54MHz	Crystal Change (Not shown in illustration)

Composite Video

The 400 and 800 Motherboards route the Composite video signals (COMP CHROMA, COMP LUM, MOD, and COMP VIDEO) to the Power Supply to build the RF video output.

Pot Keyboard Integrated Circuit

The Pot Keyboard Integrated Circuit (POKEY) provides the interface between the Keyboard, the Serial I/O ports, and the microprocessor. It also contains four semiindependent audio channels, each with its own frequency, noise, and volume control. Figure 1-9 shows the pin assignments of the POKEY.

Ground	VSS	1		40	D2	Data Bus
Data Bus	D3	2	1	39	DI	Data Bus
Data Bus	D4	3	· [38	D0	Data Bus
Data Bus	D5	4		37	AUDIO	Audio Out
Data Bus	D6	5		36	A0	Address Bus
Data Bus	D7	6		35	A1	Address Bus
Phase 2 Clock	02	7	-	34	A2	Address Bus
Pot Scan	P6	8		33	A3	Address Bus
Pot Scan	P7	9		32	R/W	Read/Write Control
Pot Scan	P4	10	POKEY	31	CS1	Chip Select
Pot Scan	P5	11		30	<u>CS0</u>	Chip Select
Pot Scan	P2	12		2 9	ĪRQ	Interrupt Request
Pot Scan	P3	13		28	SOD	Serial Output Data
Pot Scan	P0	14		27	OCLK	Serial Output Clock
Pot Scan	<u>P1</u>	15		26	BCLK	Bidirectional Clock
Keyboard Scan	KR2	16	1	25	KRI	Keyboard Scan
5 V Power	VDD	17		24	SID	Serial Input Data
Keyboard Scan .	<u>K5</u>	18		23	K0	Keyboard Scan
Keyboard Scan	<u>K4</u>	19	1	22	<u>KI</u>	Keyboard Scan
Keyboard Scan	K3	20		21	K2	Keyboard Scan

Figure 1-9. POKEY Pin Assignments

Peripheral Interface Adaptor

The Peripheral Interface Adaptor (PIA) (6520) has two 8-bit programmable I/O ports and two control bits for each port, for a total of ten lines per port. Figure 1-10 shows the pin assignments of the PIA.



Figure 1-10. PIA Pin Assignments

Key-In Key-Out Integrated Circuits

These two 4051 (Z101 and Z102) integrated circuits are used to scan the Keyboard for input data on the 400 and 800 Computer Consoles. The 4051 integrated circuits are analog multiplexers controlled by the input lines A, B, C and X.

Memory Map Decoder

The Memory Map Decoder integrated circuit (Z103) on the 400/800 Motherboard is a one-of-ten decoder. Four input lines (pins 12, 13, and 14, and 15) determine which output line is selected. The 400/800 Computer Console uses only three of the input lines (pins 13, 14, and 15 and pin 12 being grounded) for a total of eight selected output lines (SO -S7). Refer to Table 1-1 for the line selected for each input combination.

Signal - Grd		A15	A14	A13	Active		
Pin	-	12	13	14	15	Line	Device
		L	L	Ļ	L	1 - SO	8K RAM BLOCK
		L	L	L	н	2 - S1	8K RAM BLOCK
		L	L	Н	L	3 - S2	8K RAM BLOCK
		L	L	Н	н	4 - \$3	8K RAM BLOCK
		L	Н	L	L	5 - S4	8K RAM/CARTRIDGE L,R
		L	Н	L	н	6 - S5	8K RAM/CARTRIDGE L
		L	н	Н	L	7 - S6	2K ROM
		L	н	Н	L	7 - S6	I/O DECODER (Z105)
		L	Н	Н	Н	9 - S7	4K ROMs (2-"E" & "A")

Table 1-1

Memory Map Selected Lines

I/O Decoder

The I/O Decoder integrated circuit (Z105) is a one-of-eight decoder/demultiplexer. The I/O Decoder is used to select the different output devices, such as PIA chip, POKEY chip and the CTIA chip. Only four of the possible output selections are used. (See Table 1-2.) The I/O Decoder is enabled by inputs on pins 4, 5, and 6; pin 4 input coming from the Memory Map Decoder (S6); pin 5 input coming the Address Bus and pin 6 input coming from the Chip Select (CS) line. The Binary Decode is provided by the Address Bus (A08, A09 and A10).

Figure 1-11 illustrates placement of the audio inductor on the 800 Motherboard. L102 is changed from 2.0uh to .82 uh.



Figure 1-11 800 PAL and UK Audio Inductor

Table 1	-2
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Pin	Enable			Binary I	Decode			
	A12 6	2 A11 6	S6 4	A10 3	A59 2	A8 1	Active Pin	Device Selected
	н	L	L	L	L	L	YO - 15	CTIA
	н	L	L	L	L	Н	14	Not used
	н	L	L	L	н	L	Y2 -13	POKEY
	Н	L	L	L	н	Н	Y3 -12	PIA
	Н	L	L	Н	L	L	 11	Not Used
	Н	L	L	Н	L	Н	Y 5 - 10	External Select
							9	Not Used
							7	Not Used

I/O Decoder Select Line

Motherboard Console - 800

Provided in Motherboard Console - 400, for items similar in both the 400 and 800 Console Motherboards. The following paragraphs describe those items unique to the 800 Console Motherboard.

The 800 Console Motherboard contains the POKEY chip (A101), the PIA chip (A102), the Keyboard Key-In/Key-Out analog multiplexers (Z103 and Z104), the I/O Decoder (Z101), Bi-directional Data Buffers (Z105 and Z106), the controller jacks (J101 through J104), the Keyboard connector jack (J106), the left and right Program Cartridge jacks (J108 and J109), the CPU connector jack (J101), the ROM Personality connector jack (J107), and the RAM Memory connector jacks (J102, J103, and J104). See Figures 1-12 and 1-13.

Bi-directional Data Buffer

The Bi-directional Data Buffers (Z105 and Z106) are 74LS243 quad transceivers, commonly referred to as tri-level buffers. Tri-level refers to the three levels that can occur in the device; the first level pin 1 going high and pin 13 staying low, allows data to flow through the data buffer in the direction of the CPU; the second level, pin 13 going high and pin 1 staying low, allows data to flow through the data buffer in the direction of the POU; the second level, pin 13 going high and pin 1 staying low, allows data to flow through the data buffer in the direction of the POKEY chip, the PIA chip and the Personality PCB; the third level, with pin 1 and pin 13 both staying low, creates a high impedance condition in the data buffers and allows other devices to transmit data on the Data Bus lines. This high impedance state also isolates the CPU and the RAM PCB from noise generated from a device using the Data Bus lines.

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I/O Decoder

The I/O Decoder integrated circuit (Z101) is a one-eight decoder demultiplexer. The I/O Decoder is the same in the 400 and 800, but is labeled Z101 in the 800 Console and Z105 in the 400 Console.

ROM Personality Board

The ROM Personality printed circuit board plugs into connector Jack J107 and occupies memory locations D800 through FFFF. The Personality board contains the operating system on three ROM chips, two 4K chips and one 2K chip (see Figures 1-13 and 1-14). The two 4K ROM chips (A401 and A403) contain the I/O subsystem, interrupt processing, initialization Power-Up and Reset. The 2K ROM chip (A402) contains the floating point arithmetic package. Different ROMs are used in PAL & UK versions.

o I/O Subsystem

The I/O subsystem contained in the ROM Operating System provides a high-level interface between the user programs and the Console and peripheral hardware. All peripheral devices capable of dealing with character data have symbolic names (such as K, D, P, E) and may be accessed using a Central I/O (CIO) routine.

o Interrupt Processing

All hardware interrupts are handled by the interrupt subsystem in the Operating System. Vectored addresses contained in RAM memory point to subroutines in ROM to handle each type of interrupt.

o Initialization

There are two levels of initialization provided by the system, Power-Up and Reset. Power-Up initialization is performed each time the system power is turned on, and Reset initialization is performed each time the Reset key is pressed.

Whenever the system power is turned on, the Operating System examines and notes the configuration of the unit. The Operating System performs the following actions at Power-Up:

- Determines the highest available RAM address
- Clears all RAM to zeroes
- Establishes all RAM interrupt vectors
- Initializes the ROM Cartridges
- Sets-up the video screen (24 x 40 text mode)
- Boots the cassette if desired
- Checks ROM Cartridge for disk boot instructions
- Boots the disk if desired and a disk drive is attached
- Transfers control to the ROM cartridge, and booted program.

Whenever the Reset key is pressed, the Operating System performs some, but not all, of the functions performed at Power-Up. The Operating System performs the following actions after the Reset key is pressed:

- Clears the Operating System portion of RAM memory
- Re-establishes all RAM interrupt vectors
- Formats the Handler Address table
- Initializes the ROM Cartridges
- Sets-Up the video screen for 24 x 40 text mode
- Transfers control to the ROM Cartridge and booted program

The remaining 2K of Operating System ROM is a floating point program which is not used by the other parts of the Operating System itself, but is available to non-resident programs such as BASIC, Calculator, PASCAL, etc. The following routines are among those found in the ROM program:

- ASCII to floating point and floating point to ASCII conversion
- Integer to floating point and floating point to integer conversion
- Floating point log, exponent, and ploynomial evaluation
- Floating point number clear, load, store and move

POWER SUPPLY

The 400 and 800 Power Supply have identical circuitry, with a few exceptions. (See Figures 1-13 and 1-15.) The Console Power Supplies receive 9Vac (J204 and J206, 400 and 800 respectively) from the external power adaptor (transformer) provides +5 Vdc, and +12 Vdc, and -5 Vdc for the Console. Both the 400 and 800 Power Supplies have two power ON/OFF switches, S202 and S203 for the 400 Console, and S201 and S202 for the 800 Console. S202 and S201, respectively, are Power Interlock switches.

The RF signal is generated in both the 400 and 800 Power Supplies from the MOD signal received from the motherboard. It is routed through the A203, the RF MOD, to develop the RF output through.

A peripheral connector jack, J202 for the 400 Console and J204 for the 800 Console, provides the serial data-in/data-out port for the system. Devices are "daisy chained" together from this one output port. Each peripheral device is identified by a unique address, enabling all devices to reside on one output port.

Also contained on the 800 Power Supply board is the Monitor connector jack (J205). Present at J205 are the Composite video signals to drive a video monitor. The 800 Power Supply board also contains switches S204 through S207. These switches are the System Reset, Option, Select, and Start, respectively.

ROM CARTRIDGE

The Atari ROM Cartridge contains two ROM chips designed to provide a specific program application (See Figure 1-20). The 6502 microprocessor reads the information contained within the ROM chips by addressing memory locations 8000 through BFFF Hex. When the ROM Cartridges are inserted in the motherboard, they disable the RAM Memory address locations 8000 to BFFF, in 8K increments. The "left" ROM Cartridge overlays memory locations A000 to BFFF, and the "right" ROM Cartridge overlays locations 8000 to 9FFF.

ACCESSORIES

AC Power Adaptor

The AC Power Adaptor plugs into a standard wall outlet to provide the 9Vac used by the Consoles. The other end of the power adaptor plugs into the power jack on either Console.

TV Switch Box

The TV Switch Box allows the Console to be connected to the 300 ohm RF antenna or 75 ohm cable inputs on a typical televison set.

'BASIC' Program Cartridge

The 'BASIC' Program Cartridge (provided) is a standard feature for both Consoles and contains the ATARI BASIC Interpreter.









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PAL/UK

1-25

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POWER SUPPLY BOARD ATARI 400


Figure 1-15. 800 Power Supply Flow Diagram



POWER SUPPLY BOARD ATARI 800

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PAL/UK

ADDRESS BUS . ADDRESS DECORDER/ DEMULTIPLEXER FOR ROM "F" ROM "E" ROM "D" OUTPUT DEVICES PIA, POKEY, GTIA & D5XX-D6XX ADDRESSES TO MOTHERBOARD DATA BUS DATA BUFFER SEL & I/O CONTROL **R/W EARLY** RAM S5 DATA BUFF RAM S4 DECODE A15 Ø2, ADDR D5XX, D6XXX & POKEY, GTIA, PIA CS RASTIME 1 p2 В U RASTIME DELAY WRITIME F CIRCUIT F E R ØI . •

> PERSONALITY BOARD **ATARI 800**

Figure 1-16.

800 Personality Board





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PAL/UK

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¹⁶K DYNAMIC RAM ATARI



GAME CARTRIDGE BOARD

PAL/UK

1-33

ATARI Home Computers



810

1

3

S D I

0

1



SERIAL DATA I/O

410

PROGRAM

RECORDER

ATARI HOME COMPUTER SYSTEM BLOCK DIAGRAM

3-RS232 PORTS I - 20MA CURRENT LOOP PORT

850

INTERFACE

830

MODEM

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SECTION 2

SILKSCREEN AND SCHEMATICS

The following pages contain representative silkscreens and schematics for the ATARI 400/800 Computer Consoles. Minor variations in design may be encountered depending upon the production date of the Console. These drawings provide all details required for an in-depth understanding of both the 400 and 800 Consoles.

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400 Motherboard Scehmatic Page 1 of 2

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Figure 2-3. 400 Power Supply Silkscreen



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Figure 2-7. 800 Power Supply Silkscreen

ATARI Home Computer

Figure 2-8. 800 Power Supply Schematic







SO



Z403







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PERSONALITY BOARD 0+5 Q+5 Q+5 -0+5 Vcc C403 C406 C405 C402 **C**401 侵 **ATARI 800** 22 GND 7 12 12 GND D0 D1 D2 D3 D4 D5 D6 D7 GND 9 Vcc Vcc 9 GND Vcc DO DI D2 D3 DO DO 10 11 13 14 15 16 10 10 11 Di D2 01 D2 13 14 15 16 DATA BUS 13 D3 D3 mm B 14 _____ D4 D5 D6 D4 D5 D4 15 c D5 D6 D 16 D6 Figure 2-10. 4 17 17 17 D7 D7 D7 AO AI A2 A3 A4 A5 A6 A7 A8 A9 AIO AII AI2 S7 8 80 A0 A1 A2 A3 'A4 A5 A0 A1 A2 A3 A4 A5 A6 A7 A8 A402 ROM "D" C012389 7 7 6 5 4 3 A403 ROM "E" 7 6 5 4 3 A L 4401 ROM"F" C.O.IS.299 C015199 E A2 10 A3 A4 A5 9 ADDRESS BUS 2 2 ł **A**6 A6 800 Personality Board Schematic 6 A7 A7 A6 23 22 19 23 8 2 84 22 A9 A9 A9 Ш 19 19 AIO AIO AIQ CS (AII) 18 21 20 L 18 AII AH 12 21 CS (AI2) ČŠ CS (A12) CS (AI2) CS H 20 čŝ **S**6 м D6XX W (G1) (G2B) (C) (B) (A) AI2 5 AII 5 AI0 3 A 9 2 DSXX PIA CS POKEY CS 10 12 13 15 X 18 19 -<5 -<3 -<2 G TIA ČŠ 13 1 < 0 84 Q+5 EXSEL 14 Z 4 01 ₹ 8402 2.2K Q +5 Z403A 74L5138 R401 4.7K 0+5 Q+5 .01 .01 Z4038 7 GBA (G2A) N.U. _14 12 A 14 Z403C Z4030 8 GND Vcc NC Z 402 ĞΒΑ 15 -**||** C404 .01 -0+5 ۵ 4 ₹R404 74L500 £ R/W EARLY RAM 55 RAM 54 2402A Ą U N P AIS R Q+5 ø 2 S 14 Z 402C RASTIME 16 a T L401 L22µh T C408 T 68pf Z403 Z4028 74 L 509 ¥ Taig WRITIME T \$499 T \$1%7 øı 17

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2-15



Figure 2-11. CPU Board Silkscreen 2-16

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TADI II----

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Figure 2-14. 8K RAM Board Schematic

CO14331 = RAM



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1. . . .

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Figure 2-16. 16K RAM Board Schematic

SECTION 3

TROUBLESHOOTING AND TESTING

OVERVIEW

This section describes the procedures to maintain, troubleshoot, and test the ATARI 400/800 Computer Consoles. The section is divided into two major categories:

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- I. TESTS
- 2. TROUBLESHOOTING

TESTS

The following discussions pertain to the troubleshooting procedures required to checkout the ATARI 400/800 Home Computer Consoles.

Equipment Needed

You require 6 basic pieces of equipment in order to analyze the failures of the ATARI 400/800 Home Computer Console. These items include:

- 15MHz oscilloscope
- Stand Alone Test Cartridge (SALT II)
- Peripheral Port Test Connector
- Hand Controller Jack Test Connector
- Television Set (properly adjusted)
- Small Tool Kit

ATARI Home Computer

Testing With And Without The SALT II Cartridge

All tests are reviewed in this section. Procedures for the use of the tests are detailed in Section 5, 400 Diagnostic Flowchart, and Section 7, 800 Diagnostic Flowchart.

OVERVIEW OF TESTS

A variety of test routines can assist you in identifying probable sources of problems within the computer console.

Power-Up Test

This test prepares the Console for the remainder of the tests. Should the Console fail this test, no other test results can be considered valid.

• Format: Connect the power adaptor to the Computer and the Computer to the television set. Make sure there is not a cartridge in the console --turn the POWER switch ON. The words <u>ATARI COMPUTER - MEMO PAD</u> should appear on the screen in the upper left corner.

Keyboard Test

This test verifies that all keys of the keyboard are properly functioning. This test also verfies that the POKEY chip's keyboard functions are operating properly. If one key fails, then the problem is likely the keyboard. If more than one key fails, you must perform further tests. (These tests are discussed later in this section.)

• Format: Depress each key of the keyboard. As you press each key, watch the screen to verify if the computer is echoing the key struck on it. Be certain to use the CTRL key with other keys. This checks special graphics functions not tested elsewhere. (See Figure 3-1)

RAM and ROM Test

This test verifies that the CPU, RAM, and ROM chips are all properly functioning.

- Format: Due to the possible complexity of this test, it has been broken into four subsections.
 - 1. Turn the POWER off, insert the SALT II cartridge (for the 800, use the left cartridge slot), and turn the POWER on. The SALT Header should appear on the television screen (See Figure 3-2). This verifies that the CPU, Operating System (OS) ROMS, and the lower RAM are functioning.



Figure 3-1. Special Graphics Test



Figure 3-2. SALT Header

- 2. If a green/yellow colored screen is returned, this indicates a probable OS ROM malfunction. Swap-out the set with a known good set (make certain to test after each ROM is replaced), this allows you to pinpoint the defective ROM.
- 3. If the words, SYSTEM FAILURE appear on the television screen, this indicates that the lower RAM is not functioning. When this happens and a 400 Computer is under test, turn the POWER off, swap-out the RAM board with a known good one and turn the Power on. If the SALT Header is returned to the screen, this indicates a probable malfunction in the RAM board which was removed. Refer to the DIAGNOSTIC FLOWCHARTS, Section 5 and 7 for troubleshooting procedures.

If the 800 Computer is under test, turn the POWER off and swap-out the front RAM Card with a know good one. Place the suspected defective RAM CARD into the number 2 RAM slot (the third slot behind the OS), and turn the POWER back on. This lets the SALT II cartridge troubleshoot the suspected RAM CARD later in the DIAGNOSTIC FLOWCHARTS.

4. If RAM and ROM boards have been swapped and the condition continues to persist, swap the CPU board with a known good board to isolate the problems.

* * * NOTE * * *

Once you have isolated the problem to either the RAM, ROM, or CPU boards, clean the board edge connectors and retest the boards.

The SALT II cartridge takes you through the next phase of tests. Use the SALT II cartridge to perform the following tests.

SALT II Menu

Figure 3-3 illustrates the SALT II menu of tests. The highlighted character is the command letter for each test.



Figure 3-3. SALT II Menu

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Color Bar Test

This test verfies and allows for adjustment to the color circuitry. With SALT II properly in place, enter the command letter C and press RETURN. Figure 3-4 is a black and white representation of what your television display screen should look like.





A 15-color rainbow scale is displayed above the reference bar with a single color bar below. The color bars directly above and below the reference bar should be the same color (golden rod). If not, proper adjustment of R309 makes the color bars above and below the reference bar identical.
Proper operation of the unit is indicated by you being able to make this adjustment and by consistent color within the entire span of each bar on the screen. Minor glitches on the edges of the color bars are acceptable. Leave this test on for at least 10 seconds in order to catch any intermittent problems, such as a bar momentarily changing colors or blanking out.

Any Video Test

This test verifies the console's ability to generate a video (TV) display. This test also checks for pattern sensitivity of the ANTIC chip.

By entering the command letter A and pressing RETURN, this test is activated.

Figure 3-5 illustrates the screen display for the Any Video Test. NOTE: Figure 3-5 is a black and white representation of a colored screen.

The screen should have a black background with eight vertical bars. Half of the vertical bars should be narrow, and the other half, much wider. A horizontal bar should appear across the top of the screen. From the left to right, the shade of color on the horizontal bar should change. On the right of the bar, two Vs should be displayed, right side up.



Figure 3-5. Any Video Test Screen

Gray Bar Test

This test verifies that the CTIA (GTIA) is generating three LUM bits. By pressing the command letter G and then **RETURN**, this test activates. Figure 3-6 illustrates the screen display of the Gray Bar Test. The screen is divided into eight equal sized horizontal bars. The bar at the top of the screen should be black and subsequent bars should progress to white at bar eight. The bars should lighten in even shades. The screen should be steady and unchanging. These lines may have minor glitches at their edges. A thin white line should always appear just over the top (black) bar. No color should appear anywhere on the screen. The areas above the top (black) bar and below the bottom (white) bar are of no importance to this test. This test should be left on for at least 10 seconds to ensure that there is no "flashing" of color or shifting of the gray bars.



Figure 3-6. Gray Bar Test Screen

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Keyboard Test

This test verifies the Console's ability to accurately accept operator input from the keyboard.

By pressing the command letter K and RETURN, this test is activated. You are to press each of the keys <u>EXCEPT</u>, the SPACE BAR, CNTL and both SHIFT keys. Each letter pressed is returned to the display screen. Once this portion of the test is completed, hold down the CNTL key and press the letter A. The letters <u>CTRL</u> are returned to the screen. Now, hold down the left SHIFT key and press A. The word <u>SHIFT</u> is returned to the screen. By holding down the right SHIFT key and pressing A, the word <u>SHIFT</u> is again returned to the display screen. Finally, press the SPACE BAR and then, RETURN. The words <u>KEYBOARD PASS</u> or <u>KEYBOARD FAIL</u> appear on the screen below the keyboard test. If the SALT II cartridge detects any key failures during the test, the defective keys appear on the screen in the color red.

Switch Test

This test verifies the proper operation of the four Console Switches (START, SELECT, OPTION, and SYSTEM RESET). By pressing the command letter **S** and pressing **RETURN**, this test is activated. As you press each of the Console Switches their names should be returned to the display screen. Upon pressing the final switch, the word **PASS** or **FAIL** is returned to the screen.

Tone Test

_ ___ _ __ _

This test verifies the ability of the system to generate four sound registers through its sound generation circuits. Press the command letter T and **RETURN**. A prompt (question) is returned to the screen asking you which register you want to test. You must press the key with the number of the register you want to test (1, 2, 3, or 4) and then press **RETURN**.

The test generates eight tones in descending order. The first three tones are very high and may be inaudible to some people. Each tone begins at maximum volume and fades to minimum volume. It is necessary for you to enter a number for each additional test sequence. Make certain to test all four sound registers.

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NOTE: The television volume control may have to be turned up in order for you to hear the first three tones.

Display Options

This function, which is not a test, displays a diagnostic matrix when used in conjunction with either the RAM TEST or the PORT TEST. It allows you to identify which ROM chip has failed when used with the VERIFY ROM TEST.

By pressing command letter D and RETURN you access to this function. The screen returns the prompt to enter a test format. To use the PASS/FAIL indicator, enter the command letter P and press RETURN. To display the ERROR TABLE, enter the command letter E and press RETURN. For the following PORT, VERIFY ROM, and RAM TESTs, press the command letter E and RETURN. The screen prompts you to enter the command letter S for a single test pass, or C for continuous test passes.

You are now ready for the three tests. To terminate any of the following three tests, press the **SPACE BAR**. <u>NOTE</u>: The RAM test continues its current test pass before it stops.

Port Test

This test verifies the ability of the computer system to communicate with the operator through the controller jacks and the peripheral I/O port.

The command letter **P** and **RETURN** activates this test. Make certain that the Peripheral Jumpers are in place, and press **RETURN** again. Figure 3-7 illustrates the Port Test Matrix Display. This figure is a black and white representation of a color television screen. The zeros should be a blue tint.



Figure 3-7. Port Test Screen

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The four digit number in the lower-right corner of the display screen shows the number of tests completed. In addition, the four digit number above it in red is a error counter which indicates the number of times the test has failed.

If a failure occurs, a Red 1 is displayed in the matrix, this shows you the location of the errored condition. Table 3-1, Port Test Legend should be used to determine the cause of the failure condition. (Please note, a blinking 1 at location A, 5 does not indicate a failure.)

A passing condition for all test is indicated by a Blue 0 in that location (i.e., C, 0 or D4). If the failed test passes on the next test pass, the Red 1 is replaced by a Blue 0. The error counter in the lower-right corner of the screen increments by one for each error .

Verify ROM Test

This test checks the Console's ROMs by performing checksum tests on them. By entering the command letter V and pressing **RETURN** you activate this test. The screen displays a checksum for each ROM and the value returned by the MATH PACK together with a PASS or FAIL indicator for each. Upon completion of the test, the screen displays **VERIFY ROM** and either **PASS** or FAIL for the entire test. This test can be used to pinpoint which ROM is failing. If you suspect a ROM is intermittently failing; run this test for 15 or 20 minutes.

RAM Test

This automatically uses six different tests to verify the operation of the RAM boards. Enter the command letter R and press **RETURN** to begin this test. A prompt is returned to the screen asking how many 8K blocks of memory to check (maximum of five). Type the number of memory blocks in the unit and press **RETURN**. (Remember that, l equals each 8K RAM card and 2 equals each 16K RAM.)

The computer displays the amount of RAM it is testing. If the amount is not what you entered, one of two conditions may exist: 1) the unit does not contain the amount of memory you thought it did; or, 2) the unit has defective RAM card(s).

Figure 3-8 illustrates a defective RAM test system response screen. The four digit number in white at the bottom right of the screen indicates the number of tests completed. A red four digit number directly above this is used to count the number of failures.







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As was the case with the PORT Test, failures appear as Red 1s in this display. If the pattern is in a state of constant change, one of the RAM boards probably has a set of defective 74LS158 chips. If you replace the chips make certain that the new chips have the same manufacturer and the same date code. This ensures compatibility. To determine which board(s) is(are) defective, perform the following three steps:

- 1) Turn off the power.
- 2) Remove one of the boards.
- 3) Start the test from Display Options, page 3-10.

If the pattern is stable, look at line B, Columns 4 thru 7 to determine which board is defective. (See Table 3-2).



Figure 3-8. RAM Test Screen

Table 3-2

Defective RAM Boards

Defect		
Indicator	Description	
B , 4	lst 8K Block	
B,5; or	2nd 8K Block	
B,4 and B,5	•	
B,6; or	3rd 8K Block	
B,4 and B,6		
B,5 and B,6;	4th 8K Block	
or		
B,4, B,5 and	. •	
В,6		
B.7: or	5th 8K Block	
B,4 and B,7		

Compare rows D and E, if there is a difference between any one column use Table 3-3 to identify specific defective chips. If more than one column is different replace the 74LS244 chip and retest.

ATARI Home Computer

Table 3-3

Defective RAM Identifier

Difference	
Column	Description
0	Z512
1	Z511
2	Z510
3	2509
4	Z508
5.	2507
6	Z506
7	Z505

<u>M Test</u>

This test verifies the proper operation of the Video Buffer Chip (400-All1 and 800-Al03).

To perform this test, turn off the Console POWER, remove the SALT II cartridge and insert the BASIC cartridge. Turn the POWER on and perform the following three key entries:

- 1) Type: **NEW** and press **RETURN**.
- 2) Type: 10?"M"; :GOTO 10 and press RETURN.
- 3) Type: RUN and press RETURN.

The system starts printing Ms, character after character, line after line. If any are blurred and/or run together, the Video Buffer Chip or another of the discrete components in the video summing circuitry on the mainboard is probably defective.

To stop this test, press BREAK or SYSTEM RESET.

Star Raiders Test

If the Console has effectively passed all previous tests and performs this game without any visible problems, it is almost certainly operating properly.

Turn POWER off, remove the BASIC cartridge, insert the STAR RAIDERS cartridge, and turn the POWER on. Now, go through the game's various screens and functions (play the game).

Shake Test

Disconnect the unit, grasp it firmly with both hands and shake it vigorously for approximately 10 to 20 seconds. DO NOT HIT or STRIKE the unit against the bench or other hard object without having your fingers between the unit and the surface being struck. Reconnect the unit and turn the POWER on. Perform the MEMO PAD test to make certain that none of the connections, boards, and/or components have become unseated, and that the unit is properly operational.

<u>Burn-In</u>

After the unit has successfully passed all the previous procedures and is operating correctly, it is ready for BURN-IN.

Operating the system on BURN-IN continuously for a recommended 24-hour period. Use one of the following three methods.

- I) Insert the SALT II cartridge and run it with continuous RAM or PORT test.
- 2) Insert Star Raiders or another game cartridge and run it.
- 3) Perform the 400/800 Console Test (810 Disk Drive required).

ATARI Home Computer

At the end of the BURN-IN period, check the unit again for any malfunctions, using SALT II Test checks. Once the unit has passed all the final checkout procedures, it is ready to be returned to the customer.

DESCRIPTION OF THE OTHER FUNCTIONS FOLLOWS:

Production Test

Command letter "Z". This function allows you to run through the series of test semiautomatically by pressing the space bar. It will ask you the serial number of the unit and print it out on a printer with the word PASS or FAIL.

Boot B

This function is not used at this time.

Examine

Command letter "E". This allows you to test a specified RAM location (address).

<u>Adjust</u>

Command letter "J". This is used to debug audio and serial port control lines (Motor Go & Command) on the system console. A fixed frequency audio signal is produced while PIA ports are exercised.

SUMMARY

This section has taken you step-by-step through all the tests and general troubleshooting steps required for evaluation of a suspect defective 400/800 console. Now read through the section, DISASSEMBLY and ASSEMBLY, before going on to Section 5, Diagnostic Flowcharts, and Section 7, 800 Diagnostic Flowchart.

SECTION 4

DISSASSEMBLLY/ASSEMBLY MAINTENANCE

ATARI 400 HOME COMPUTER CONSOLE - DISASSEMBLY

The following describes the procedures required to disassemble the 400 Computer Console. Read the following NOTES first, then proceed.

* * * NOTE * * *

- I. Be very careful about mixing screws. Plastic and aluminum parts can be easily stripped if the wrong size screw is used.
- 2. Excessive torque on screws can strip the plastic and aluminum parts.
 - Plastic 6-inch pounds torque maximum.
 - Aluminum 10-inch pounds torque maximum.
- 3. Protect the plastic surfaces of the console by working on a soft surface (a grounding pad works very well) when the Console is turned over, bottom up.
- 4. Use <u>ALL</u> static control precautions when handling any printed circuit board.

KEYBOARD AND POWER SUPPLY ACCESS

To remove the top cover, perform the following steps in the exact order given.

- Turn the unit side down.
- Remove four screws from the bottom cover. (See Figure 4-1.)



Figure 4-1. 400 Console, Bottom Cover Screw Location

- Turn unit upright.
- Unhook top cover from keyboard (see Figure 4-2).
- Open cartridge door.
- Lift top cover off.



Figure 4-2. 400 Console Top Cover Removal

KEYBOARD REMOVAL

To remove the keyboard, perform the following steps in the exact order given. Use Figure 4-3 as a reference for the following two steps.

- Remove single keyboard screw.
- Lift left end of keyboard and disconnect keyboard ribbon cable.



Figure 4-3. 400 Console, Keyboard Removal

POWER SUPPLY REMOVAL

To remove the power supply, perform the following steps in the exact order given. Use Figure 4-4 as a reference for the following four steps.

- Disconnect RF cable from power supply.
- Remove two screws from power supply.
- Gently pull power supply away from casting 1/4 inch and lift out the interlock switch plunger.
- Lift the power supply straight-up off the motherboard connector pins.



Figure 4-4. Atari 400 Console, Power Supply Removal

CPU, RAM, AND MOTHERBOARD ACCESS

To remove the module assembly, perform the following steps in the exact order given. Use Figure 4-5 as a reference for the following two step.

- Disconnect and remove speaker assembly.
- Lift module assembly out of the bottom cover.

CPU AND RAM REMOVAL

To remove the CPU and RAM printed circuit boards, perform the following steps in the exact order given. Use Figure 4-5 as a reference for the following six steps.

- Close and latch the cartridge door.
- Set the module on its back.
- Remove the eight screws from the bottom shield and lift off the shield.
- Lift the motherboard assembly out of the aluminum casting.
- Carefully unplug the CPU and/or RAM boards.
- Unhook and remove the plastic cartridge guide.



Figure 4-5. Atari 400 Console, Module Assembly

This concludes the disassembly of the 400 computer console.

ATARI Home Computer

ATARI 800 HOME COMPUTER CONSOLE - DISASSEMBLY

The following describes the procedures required to disassemble the ATARI 800 Home Computer console. Read the NOTES on pages I thru 3 first, and then proceed.

ACCESS TO RAM BOARDS AND ROM BOARD

To gain access to the RAM and ROM boards, perform the following steps in the exact order given.

Remove the cartridge door assembly. Use Figure 4-6 as a reference for the following eight steps.

- Turn the system power switch to the OFF position.
- Open the cartridge door.
- Turn the cartridge door clamps towards the outside of the Console.
- Lift the cartridge door assembly 1/4 inch, pull it towards you, and lift it off.

Remove the RAM and ROM modules.

- Lift out the RAM module(s).
- Lift out the ROM module.
- Lift out any cartridge(s).
- Turn cartridge door clamps to original position.

CARTRIDGE DOOR ASSEMBLY	
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Figure 4-6. Atari 800 Console, Cartridge Door Assembly Removal

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ATARI Home Computer

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ACCESS TO POWER SUPPLY AND KEYBOARD ASSEMBLY

To gain access to the power supply and keyboard assembly, perform the following steps in the exact order given.

REMOVE TOP COVER

Use Figure 4-7 as reference for the following three steps.

- Turn unit upside down.
- Remove five screws from the bottom cover.
- Tilt the back of the bottom cover up and towards you to remove it.



Figure 4-7. Atari 800 Console, Bottom Cover Removal

REMOVE THE PCB MODULE

Use Figure 4-8 as a reference for the following seven steps.

- Remove two screws from the aluminum casting flange.
- Remove the single screw from the power supply board (lower left corner).
- Disconnect speaker cable, remove speaker and set it aside.
- Turn the unit over.
- Pull the back of the console top cover assembly to 90^o separating it from the PCB module.
- Reach over the top cover and unplug the keyboard's ribbon cable.
- Set the top cover assembly aside.
- Lift the power supply board straight up.
- Remove plastic cartridge guide by unhooking the latches from the bottom side of the motherboard.



Figure 4-8. 800 Console, Module Assembly Removal

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REMOVE THE POWER SUPPLY

Use Figure 4-9 as a reference for the following five steps.

- Unplug the RF cable from the power supply board.
- Unplug the power supply harness.
- Remove three screws from power supply board.



Figure 4-9. Atari 800 Console, Power Supply Removal

ACCESS TO CPU PRINTED CIRCUIT BOARD

Use Figure 4-10 as reference for the following four steps.

- Turn the unit upside down.
- Remove the nine screws from the lower shield.
- Lift the motherboard and lower shield out of the aluminum casting.
- Remove the CPU PCB.



Figure 4-10. Atari 800 Console, CPU Printed Circuit Board Removal

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ACCESS TO MOTHERBOARD

Use Figure 4-11 as reference for the following three steps.

• Carefully slide the tip of a screwdriver underneath the motherboard next to the nylon clip. Gently raise the handle of the screwdriver, prying off the nylon clip. Repeat this operation for the remaining three nylon clips.

* * * CAUTION * * *

Be careful not to bend any of the pins on the Motherboard Connector.

Do NOT allow the tip of the screwdriver to damage traces.

- Lift the motherboard off the lower shield.
- Remove the plastic cartridge guide by unhooking the four latches from the bottom side of the motherboard.

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Figure 4-11. Atari 800 Console, Motherboard Removal

KEYBOARD REMOVAL

Use Figure 4-12 as reference for the following three steps, to remove the keyboard from its case.

- Turn the top cover upside down.
- Remove four screws from the four corners of the keyboard.
- Lift the keyboard out of the top cover.

This concludes the disassembly of the Atari 800 Home Computer console.

ATARI Home Computer



Figure 4-12. ATARI 800 Console, Keyboard Removal

ATARI 400 HOME COMPUTER CONSOLE ASSSEMBLY

The following outlines the steps required to reassemble the Atari 400 Home Computer console and it's related printed circuit boards.

MODULE ASSEMBLY REASSEMBLY

Refer to Figure 4-5 as reference for the following five steps.

- Snap the cartridge guide into the motherboard (it only goes in one way).
- Insert RAM and CPU printed circuit boards into the motherboard with the component side of the PCBs facing away from you. Before reassembling the PCBs, make certain that they have been cleaned and lubricated. (Refer to pages 4-21 and 4-22 for instructions.)
- Set aluminum casting upside down, invert the motherboard and gently lower it into the casting.

* * * NOTE * * *

The CPU PCB must fit into the guides in the aluminum casting.

- Install lower shield and secure it with eight screws.
- Install the module assembly in the bottom cover.

KEYBOARD INSTALLATION

Refer to Figure 4-3 as a reference for the following three steps.

- Plug the speaker cable into the motherboard (no Polarity) and set the speaker into the bottom cover.
- Plug the keyboard ribbon cable into the connector on the motherboard.
- Gently lower the keyboard over the Power-ON LED and guide posts on the aluminum casting.

POWER SUPPLY INSTALLATION

Use Figure 4-4 as reference for the following five steps.

- Align the power supply over the motherboard connector pins and bottom cover guide posts and gently press it down.
- Install the interlock switch plunger into the aluminum casting. Make certain that the lower end of the plunger is positioned over the interlock switch and the plunger shaft rides in its notch in the power supply heat sink.
- Insert and tighten the two power supply mounting screws.

* * * CAUTION * * *

Be sure that the RF cable is not trapped under the module assembly.

- Route the RF cable through its slot in the power supply board and plug it into the power supply jack.
- Insert and tighten the single keyboard mounting screw.

Atari Home Computer

TOP COVER INSTALLATION

- Open the cartridge door.
- Slide the top cover down over the open cartridge door and the power-ON LED (Refer to Figure 4-2)
- Guide the top cover locator pins into the keyboard holes and snap the top cover hood under the keyboard.
- Close the cartridge door and set the console on its face.
- Align the top and bottom covers and insert the four screws into the bottom cover and tighten (Refer to Figure 4-1).

ATARI 800 HOME COMPUTER CONSOLE ASSEMBLY

The following outlines the steps required to reassemble the Atari 800 Home Computer Console and its related printed circuit boards.

KEYBOARD INSTALLATION

Refer to Figure 4-12 as reference for the following two steps.

- Set the top cover upside down with the keyboard in it.
- Insert and tighten the four mounting screws.

* * * NOTE * * *

Check the spacebar and keys to make sure that they are not binding before proceeding.

MOTHERBOARD INSTALLATION

Refer to Figure 4-11 as reference for the following two steps.

- Snap the plastic cartridge guide into the top side of the motherboard.
- With the motherboard right side up, snap on the four nylon clips of the lower shield. Make certain all four clips are firmly seated.

CPU PCB INSTALLATION

Refer to Figure 4-10 as reference for the following five steps.

- Plug in CPU PCB. Make certain the component side of the board faces away from the plastic cartridge guide and is firmly seated.
- Turn the aluminum casting over.
- Turn the motherboard upside down and set the motherboard and lower shield into the aluminum casting.

* * * CAUTION * * *

Make certain that the CPU PCB sets in its slot in the aluminum casting.

Insert and secure the nine screws in the lower shield.

• Set the console on its feet.

POWER SUPPLY INSTALLATION

Refer to Figure 4-9 as reference for the following six steps.

- Carefully align the power supply connector with the motherboard pins.
- Set the power supply down over the guide pins on the aluminum casting and gently press down.
- Attach strip connector between power supply and motherboard.
- Insert and tighten the three screws of the power supply board.
- Recommend the power supply harness.

* * * CAUTION * * *

Plug the power supply harness cable from the motherboard to the power supply pins with the orange or purple wire towards the aluminum casting.

• Plug the RF cable, the short end, into the power supply jack.

MODULE ASSEMBLY INSTALLATION INTO TOP COVER

Refer to Figure 4-8 as reference for the following six steps.

- Set the top cover upside down.
- Invert the module assembly and lower it into the top cover. Turn the cartridge door latches toward the inside in order to clear the top cover.

* * * CAUTION * * *

Make certain that the RF cable is not trapped between the power supply board and the top cover standoff (upper left screw hole).

- Lift the motherboard one-inch out of the top cover and plug in the keyboard harness.
- Insert and tighten two screws into the front holes of the aluminum casting and into the top cover.
- Set the speaker into its receptacle foam side down.
- Connect the speaker cable to the jack (no polarity).

BOTTOM COVER INSTALLATION

Refer to Figure 4-7 as reference for the following four steps.

- Align the bottom cover with the four-hand-controller ports.
- Seat bottom cover firmly, all the way around. Make certain the RF cable exists through its hole and is not trapped between the covers.
- Insert and tighten the five bottom cover screws.
- Set the console right side up.

RAM AND ROM MODULE INSTALLATION

Refer to Figure 4-6 as reference for the following two steps.

- Insert the ROM Module in the slot closest to the keyboard.
- Insert a maximum of three RAM modules in the remaining slots.

CARTRIDGE DOOR ASSEMBLY

Refer to Figure 4-7 as reference for the following two steps.

- Set the cartridge door assembly on the top cover and slide it to the rear of the cover. This action engages the tab of the door into the aluminum casting.
- Lock the cartridge door assembly down with the two clamps next to the program cartridge slots.

PCB CONTACT CLEANING AND LUBRICATION

The following instructions explain the procedures required to properly clean and lubricate the PCB contacts of the CPU, RAM and ROM boards once they have been removed from the motherboard.

Tools Required

- ZEP Safety Solvent or Isopropyl Alcohol
- Dust-Free Cloth
- Acid Brush
- Board Cleaning Brush
- Libriplate (DS-ES Lubricant)

Procedures

- 1. Inspect the PCB contact for flux, dirt, foreign material, and deeply serated contact fingers.
- 2. Moisten the dust-free cloth with solvent and clean the finger contacts. Make sure both sides of the contracts are clean and free of residual lubricant and contamination.

* * * NOTES * * *

Avoid touching the contact after cleaning.

- 3. If corrosion or residue remain on the contacts it is necessary to clean the contacts further using the board cleaning brush. Use the following procedures.
 - Moisten the board cleaning brush with solvent and firmly brush the contacts. Four to six strokes is enough. Be careful and do not touch any other part of the board.
 - Perform step 2 again.
- 4. Dip the acid brush into the lubricant.
- 5. Apply an even coating of lubricant to the contact fingers on both sides of the PCB. The coating of lubricant should be thick enough to protect the contact fingers from corrosion. Do not spread the lubricant to areas other than the contact fingers.

VISUAL INSPECTION

The following instructions explain specific areas to check on the Consoles for damage or abuse.

- Inspect the controller jacks and peripheral jacks for broken and/or bent pins.
- 2. Check the RF cable for cracks in the insulation, bare, or pinched areas.
- 3. With the console power ON and MEMO PAD on the screen, open the cartridge door to check the interlock switch. Using a small blade screwdriver, press the plunger down. Release the plunger and see that it is returns to its open position. In its open position the console is powered-down.
- 4. Inspect the cartridge slot for foreign objects or damage.
- 5. Inspect the power jack for bent and/or damaged pins.

If any of the above damage is found, repair the defective area. Use the disassembly and assembly instructions at the beginning of this section.

SECTION 5

400 DIAGNOSTIC FLOWCHART

The Diagnostic Flowchart is intended to be easy to use and the primary aid when troubleshooting the ATARI 400 Computer Console. Follow the prompts in the order presented. When a question is asked, follow the line from that box which best applies to the unit's situation. The flowchart leaves little to chance, it tells you when to perform a specific test and when to replace components.

Swap Out Procedure

At many places in the diagnostic flowchart, a box tells you to "swap-out" a chip or a number of chips in a particular order. The "swap-out" instruction means that you should replace the indicated components (one at a time) with a known good component of the same type. The 400 should then be tested with the new, known-good component in place to see whether the "swap-out" solved the problem being checked. If the swap-out did not fix the problem, the known-good component should be removed, and the original component reinserted. In this way, you avoid needlessly replacing good components.

CAUTION:

Extreme care should be taken when handling the integrated circuit chips. They are all <u>very</u> sensitive to static electricity and can easily be erased by careless handling. <u>Always</u> keep the chips in their plastic carrier tubes or on conductive foam when not handling them. Make certain you are well grounded when handling the chips. Atari strongly recommends that you wear a conductive grounding band (which ties from your arm to ground) when handling the chips.

The chips are also susceptible to damage from stress when being removed from or inserted into the sockets. Always use a chip-puller when removing the chips. Do not pry the chip out with a screwdriver or any other tool.

Failure to follow the above guidlines results in unusally high chip failure rates and extra expense.

ATARI Home Computer



400 POWER-UP CATASTROPHIC FAILURES AND BASIC OPERATIONS

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400 POWER-UP CATASTROPHIC FAILURES AND BASIC OPERATIONS

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400 POWER-UP CATASTROPHIC FAILURES AND BASIC OPERATIONS SOLID BLUE SCREEN

400 POWER-UP, PART II



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ATARI Home Computer

400 COLOR BAR TROUBLESHOOTING START Swap-out A301 and A302, on CPU Board Does screen look YES Go to TIA, Page 5-13 like Figure 3-4 NO Swap CPU Board Does screen look like Figure 3-4 Trace color circuitry on CPU Board. YES Make cetain to check color delay circuit and R309 NO Swap-out Alll, Q107 on Motherboard Does screen look like Figure 3-4 YES Go to TIA, Page 5-13 NO Go to next page

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400 COLOR BAR TROUBLESHOOTING (cont)



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400 GREY BAR



400 GREY BAR TROUBLESHOOTING



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400 GREY BAR

TROUBLESHOOTING (cont)



400 GREY BAR TROUBLESHOOTING (cont)



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400 ANY VIDEO TROUBLESHOOTING



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400 ANY VIDEO

TROUBLESHOOTING (cont)





KEYBOARD



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KEYBOARD (cont)



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400 TONE TEST



400 TONE TEST (cont)



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400 TONE TEST (cont)



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400 CONSOLE SWITCH TEST



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400 VERIFY ROM (cont)

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ATARI Home Computer

400 RAM (cont)

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ATARI Home Computer

400 PORT (cont)

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ATARI Home Computer

Table 5-1

CLOCK CIRCUIT

PIN NUMBER	BOARD	FREQUENCY	SCOPE CHART # *
21 of J101	CPU	1.789	. 1
22 of J101	CPU	1.789	2
8 of Z302	CPU	1.789	2
9 of Z302	CPU	1.789	1
10 of Z302	CPU	1.789	2
13 of Z302	CPU	1.789	3
37 of A303	CPU	1.140	4
6 of Z301	CPU	1.789	3
34 of A302	CPU	1.789	3
35 of A302	CPU	3.579	5
29 of A301	CPU	3.579	5
28 of A301	CPU	3.579	6
Collector of Q102	800 Main Board	3.579	6
Collector of Q104	400 Main Board	3.579	6
7 of AlOl	400/800 Main Board	1.789	1
25 of A102	400/800 Main Board	1.789	1

* Use Scope Waveform Legend on next page to see illustration of waveform.



Scope Waveform Legend

ATARI Home Computer

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Legend

1. ESC	15. BREAK	29. RETURN	43. CAPS LOWR
2. 1	16. CLR SET TAB	30. CRTL	44. SHIFT
3. 2	17. Q	31. A	45. Z
4. 3	18. W	32. S	46. X
5. 4	19. E	33. D	47. C
6. <u>%</u>	20. R	34. F	48. V
7. 6	21. T	35. G	49. B
8. 7	22• Y	36. н	50• N
9.8	23. U	37. J	51. M
10. 9	24. I	38. К	52· [
11. 0	25, 0	39. L	53.]
12. CLEAR	26. P	40.	54. ?
13. INSERT	27. +	41, +,	55. / 1
14. DELETE BACK S	28. * _	42. → ^ *	56. SHIFT
	57. SPAC	E BAR	


Defective RAM Boards

Defective RAM Identifier

Defect		Difference	
Indicator	Description	Columa	Decerition
B,4	lst 8K Block		Description
		0	Z512
B,5; or	2nd 8K Block	1	Z511
B,4 and B,5		2	Z510
		3	Z 509
B,6; or	3rd 8K Block	4	Z 508
B,4 and B,6		5	Z <i>5</i> 07
		6	Z 506
B,5 and B,6;	4th 8K Block	7	Z 50 5
or			·
B,4, B,5 and			
B,6			
B,7; or	5th 8K Block		
B,4 and B,7			

Figure and Table 5-2

ATARI Home Computer

Table 5-3

Port Test Legend



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SECTION 6

SYMPTOM CHECKLIST

The Symptom Checklist is designed to assist the experience technician arrive at a rapid diagnosis for problems. The checklist is not intended to replace the Diagnostic Flowchart as the primary troubleshooting guide, but rather, to supplement the flowchart.

Each symptom is accompanied by some possible causes and the best point to enter the Diagnostic Flowchart to locate the problem.

Symptom	Possible Cause	Diagram Entry Point
Snowy Screen	SW Box, AC Adaptor CH. Select SW, Modulator Adjustment, RF Cable Damage	AA 400, Page 5-3 800, Page 7-3
Black/Gray Screen	Verify +5V, -5V & +12V Power Supplies, CR201-209, C201-205, C210, A201, A302, A303, A301, A103, A111, Z103-Z105, Q103-4, X101	BB 400, Page 5-4 800, Page 7-4
Green/Yellow Screen	Z103-5, A03, Z303 & 4 all on ROM Board	CC 400, Page 5-6 800, Page 7-6
Solid Blue Screen	A101, Q107, X101	DD 400, Page 5-7 800, Page 7-7
No Color or Bad Color Bars with SALT II	R309 Adjust, A301-2 on CPU Board; A111, Q107 on Mainboard, X101, Q103, Q104	EE 400, Page 5-9 800, Page 7-9
	Modulator Adjustment	FF 400, Page 5-12 800, Page 7-12
No Color Bars on TIA Test	A301 on CPU Board	GG 400, Page 5-12 800, Page 7-12

ATARI Home Computer

Symptom	Possible Cause	Diagram Entry Point
No Gray Bars	A301, A111, Q107 R309 Adjustment X101, Q103 & 4 Modulator	HH 400, Page 5-14 800, Page 7-14
Upside Down Alpha/ Numerics or Player Field	A302 on CPU Board, A301 A111, Q107	II 400, Page 5-1 800, Page 7-14
	Modulator	JJ 400, Page 5-21 800, Page 7-21
Some Keyboard Keys Fail	Keyboard Failure	KK 400, Page 5-22 800, Page 7-22
All Keyboard Keys Fail	A101, Z103 & 4	LL 400, Page 5-22 800, Page 7-22
Tones Missing During Sound or Games	A101, R160, R161, R166, R170 C164, C179, C184, Q105 L101, Q106, L118, A203	MM 400, Page 5-24 800, Page 7-24
Console (Game) Switches Will Not Function	A301 on CPU Board, R119-122 C121-124	NN 400, Page 5-28 800, Page 7-28
ROM Test Failed	A401-403 on ROM Board 1403	00 400, Page 5-29 800, Page 7-29
RAM Test Failed	See RAM test Matrix, Figure 5 Table 5	PP 400, Page 5-31 800, Page 7-31
Hand Controllers Will Not Work	See Port Test Matrix, Table 5	QQ 400, Page 5-33 800, Page 7-33

SECTION 7

800 DIAGNOSTIC FLOWCHART

The Diagnostic Flowchart is intended to be easy to use and the primary aid when troubleshooting the ATARI 800 Computer Console. Follow the prompts in the order presented. When a question is asked, follow the line from that box which best applies to the unit's situation. The flowchart leaves little to chance, it tells you when to perform a specific test and when to replace components.

Swap Out Procedure

At many places in the diagnostic flowchart, a box tells you to "swap-out" a chip or a number of chips in a particular order. The "swap-out" instruction means that you should replace the indicated components (one at a time) with a known good component of the same type. The 800 should then be tested with the new, known-good component in place to see whether the "swap-out" solved the problem being checked. If the swap-out did not fix the problem, the known-good component should be removed, and the original component reinserted. In this way, you avoid needlessly replacing good components.

CAUTION:

Extreme care should be taken when handling the integrated circuit chips. They are all <u>very</u> sensitive to static electricity and can easily be erased by careless handling. <u>Always</u> keep the chips in their plastic carrier tubes or on conductive foam when not handling them. Make certain you are well grounded when handling the chips. Atari strongly recommends that you wear a conductive grounding band (which ties from your arm to ground) when handling the chips.

The chips are also susceptible to damage from stress when being removed from or inserted into the sockets. Always use a chip-puller when removing the chips. Do <u>not</u> pry the chip out with a screwdriver or any other tool.

Failure to follow the above guidlines results in unusally high chip failure rates and extra expense.

ATARI Home Computer



800 POWER-UP CATASTROPHIC FAILURES AND BASIC OPERATIONS

ATARI Home Computer



CATASTROPHIC FAILURES AND BASIC OPERATIONS SNOWY SCREEN

800 POWER-UP

ATARI Home Computer









800 POWER-UP CATASTROPHIC FAILURES AND BASIC OPERATIONS

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800 POWER-UP, PART II



ATARI Home Computer



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800 COLOR BAR TROUBLESHOOTING (cont)

Verify that each of the following levels and/or signal wave forms exist before proceeding to the next step. Use SALT II, COLOR BARS, locked into the continuous mode.



ATARI Home Computer



TIA TEST



ATARI Home Computer



800 GREY BAR



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800 GREY BAR

TROUBLESHOOTING (cont)

Verify that each of the following levels and/or signal wave forms exist before proceeding to the next step. Use SALT II, COLOR BARS, locked into the continuous mode.



800 GREY BAR TROUBLESHOOTING (cont)







800 ANY VIDEO

TROUBLESHOOTING (cont)

Verify that each of the following levels and/or signal wave forms exist before proceeding to the next step. Use SALT II, COLOR BARS, locked into the continuous mode.







KEYBOARD (cont)



ATARI Home Computer

800 TONE TEST



800 TONE TEST (cont)



ATARI Home Computer

800 TONE TEST (cont)





800 CONSOLE SWITCH TEST





800 VERIFY ROM (cont)







800 RAM (cont)

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ATARI Home Computer

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800 PORT TEST (cont)

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ATARI Home Computer

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Table 7-1

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CLOCK CIRCUIT

PIN NUMBER	BOARD	FREQUENCY	SCOPE CHART # *
21 of J101	CPU	1.789	l
22 of J101	CPU	1.789	2
8 of Z302	CPU	1.789	2
9 of Z302	CPU	1.789	1
10 of Z302	CPU	1.789	2`
13 of Z302	CPU	1.789	3
37 of A303	CPU	1.140	4
6 of Z301	CPU	1.789	3
34 of A302	CPU	1.789	3
35 of A302	CPU	3.579	5
29 of A301	CPU	3.579	5
28 of A301	CPU	3.579	6
Collector of Q102	800 Main Board	3.579	6
Collector of Q104	400 Main Board	3.579	6
7 of A101	400/800 Main Board	1.789	1
25 of A102	400/800 Main Board	1.789	1

 * Use Scope Waveform Legend on next page to see illustration of waveform.

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Scope Waveform Legend

ATARI Home Computer

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Keyboard Connection Chart

Legena	Le	g	er	1	d
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1.	ESC	15.	BREAK	29.	RETURN	43.	CAPS LOWR
2.	1	16.	CLR SET TAB	30.	CRTL	44.	SHIFT
3.	2	17.	Q	31.	A	45.	Z
4.	# 3	18.	W	32.	S	46.	x
5.	\$. 4	19.	E	33.	D	47.	С
6.	% 5	20.	R	34.	F	48.	v
7.	& 6	21.	T	35.	G	49.	В
8.	/ .	22.	Y	36.	н	50.	N
9.	ଜ ୫	23.	υ	37.	J	51.	м
10.	(9	24.	I	38.	ĸ	52.	[,
11.) 0	25.	0	39.	L	53.	
12.	CLEAR <	26.	P	40.	1 7	54.	? /
13.	INSERT	27.	• <u>-</u> .	41,	← _`	55.	/1\
14.	DELETE BACK S	28.	}	42.	→ ∧ [±]	56.	SHIFT
			57. SPACE	BAR			

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Defective RAM Boards

Defective RAM Identifier

	Defect		Difference	
I	ndicator	Description	Column	Descriptio
В,4	÷	lst 8K Block		Description
		•	ο .	Z512
в,5	5; or	2nd 8K Block	1	Z511
в,4	and B,5		2	Z510
	•		3	Z 509
в,е	i; or	3rd 8K Block	4	Z 508
в,4	4 and B ,6		5	Z507
			, 6	Z 506
в,	δ and B,6;	4th 8K Block	7	Z 505
	or		•	
в,4	4, B,5 and			
	B ,6			
В,7	⁷ ; or	5th 8K Block		

Figure and Table 7-2

ATARI Home Computer

B,4 and B,7

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Table 7-3

Port Test Legend



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SECTION 8

GAME CONTROLLERS

The following pages contain descriptions, schematics, and test procedures for the four game controllers used with the Atari 400/800 Computer Consoles.

ATARI Home Computer

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PAL/UK

JOYSTICK (X-Y CONTROLLER)

Inside each joystick is a small PC board that has 5 calculator-type keypads mounted on it. Four of these are positioned beneath the stick in square shaped pattern, and the fifth is located beneath the pushbutton (See Figure 8-1). When the stick is pushed forward, the bottom surface of the stick presses against the forward keypad, causing it to "make", thus completing the circuit connected to it. In the same way, pushing the stick back, left and right causes the respective keypad underneath that position to close and complete the circuit.





If the stick is pushed forward and to the right at the same time (that is, in a northeast direction), both the forward and right keypad close simultaneously, which causes the POKEY to see two switch closures happening at once (See Figure 8-2). The result is that the object being controlled on the screen moves diagonally. With the four keypads, 8 different directions can be attained. The pushbutton determines whether the keypad beneath it is either open or closed. (Earlier models were spring loaded.)





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JOYSTICK (X-Y CONTROLLER) CHECK

Equipment Needed

1) T.V. Set

- 2) Known good console
- 3) StarraiderTMcartridge

Procedure

- 1) Check for cosmetic damage.
- 2) Plug in cartridge and plug controller to be tested in the left player port.
- 3) Press game reset.
- 4) Move the joystick in the eight possible directions and see that the cursor leaves a trail.
- 5) Test is now completed.

GAME PADDLE

Each game paddle consists of 1 Megaohm potentiometer that, when varied, causes different values to be seen and acted upon by the POKEY IC. Also contained in the paddle is a simple spring loaded push-to-make pushbutton switch (See Figure 8-3). There are two game paddles connected to each I/O plug.



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8-5



- Figure 8-4. Game Paddle Schematic

GAME PADDLE CONTROLLER CHECK

Equipment Needed

- l) T.V. set
- 2) Known good console
- 3) SuperbreakoutTM cartridge

Procedure

- l) Check for cosmetic damage.
- 2) Plug in cartridge and plug controllers to be tested into the left player port.
- 3) Press game reset.
- 4) Press the button on one of the controllers. A ball should be served.
- 5) By turning the knob the paddle can be placed beneath the ball.
- 6) Repeat steps 3, 4, & 5 for the other controller.

SECTION 9

This section is divided into two parts. The first part contains a complete listing of all ATARI 400 Computer parts; and, the second part contains a complete listing of all ATARI 800 Computer parts.

ATARI Home Computer

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PARTS LIST

Assy	Part No.	Description	Location
CPU	14-5102	RESISTOR 1/4W IK	R302-306,313
CPU	14-5103	RESISTOR 1/4W 10K	R314
CPU	14-51R0	RESISTOR 1/4W1 OHM	R317
CPU	14-5334	RESISTOR 1/4W 330K	R308
CPU	14-5471	RESISTOR 1/4W 470 OHM	R316
CPU	14-5472	RESISTOR 1/4W 4.7K	R301,307,310,
			311,312
CPU	14-5682	RESISTOR 1/4W 6.8K	R315
CPU	19-411504	RESISTOR VARIABLE 500K	R309
CPU	34-2N3904	TRANSISTOR 2N3904	0301
CPU	C010821	CAP, POLY 820pF (50V)	C308
CPU	C014179-01	CAP. CERAMIC AXIAL 22pF (50V)	C309
CPU	C014179-14	CAP. CERAMIC AXIAL 56pF (50V)	C310
CPU	C014181-01	CAP CERAMIC AXIAI	C307
0.0	001+101-01	00111F (25V)	0,00
CPU	C014181-02	CAP CERAMIC AXIAI	C303 306
	0014101-02	0111F (25V)	0,000
CPU	C014181-03	CAP CERAMIC AXIAI	C301 302 30/ 305
	014181-05	$1 \times (25V)$	0,001,002,004,000
CPU	C01//313	101 (201)	7302
CPU	$C014386_02$	SOCKETIC (1/1 Bin)	7301 302
CPU	$C014386_{02}$	SOCKET IC (20 Pin)	7303 30/
CPU	$C014386_09$	SOCKET IC (10 Pin)	A 301-303
CPU	C014206	IC 6502 (Modified)	A 303
CPU	C01/1887	$IC \Delta NTIC (PAI)$	A 202
CPU	C014889	IC GTIA (PAL)	A 301
CPU	C014005	$\frac{1}{10} \frac{1}{2} \frac{1}{10} $	7301
CPU	C010040		1 202
CPU	C017222		V201
CPU	CA015967		1 501
CABLE	78 24001		
	C010290		
CADLE	CU10389	TORROID CORE	
CADLE	CA016254	COAXIAL CABLE ASSY	
CABLE	CAU16294		
CONSOLE	88-1006		
CONSOLE	C014013	CONSOLE DASE	
CONSOLE	C014014	CONSOLE TOP	
CONSOLE	CA014782	TOP COVER ASSY	
CONSOLE	CAU16108-01	CONSOLE ASSY (16K)	
CONSOLE	CA016108-02	CONSOLE ASSY (8K)	
CONSOLE	CA016147-01	CONSOLE BASE ASSY (16K)	
CONSOLE	CA017504	CONSOLE BASE ASSY (8K)	
DOOR	C014016	CARTRIDGE DOOR	

PARTS LIST (cont)

Assy	Part No.	Description	Location
DOOR	C014018	DOOR LATCH	
DOOR	C014019	HINGE BRACKET	
DOOR	C014020	DOOR SHIELD	
DOOR	C014103	FOAM PAD	
DOOR	C014104	CARTRIDGE DOOR SPRING	
DOOR	CA014153	DOOR ASSY	
KEYBOARD	CA014031	KEYBOARD ASSY	REPLACEMENT LISTED
KEYBOARD	CA017999	KEYBOARD ASSY	(REPLACEMENT FOR P/N CA014031)
MAIN	14-5101	RESISTOR 1/4W 100 OHM	R101-118.155.157
MAIN	14-5102	RESISTOR 1/4W1K	R160.162.169.172
MAIN	14-5103	RESISTOR 1/4W 10K	R165
MAIN	14-5104	RESISTOR 1/4W 100K	R182
MAIN	14-5105	RESISTOR 1/4W1MEG	R181
MAIN	14-5123	RESISTOR 1/4W 12K	R168.173.176
MAIN	14-5124	RESISTOR 1/4W 120K	R179
MAIN	14-5151	RESISTOR 1/4W 150 OHM	R119-123,134-149
			151-154
MAIN	14-5153	RESISTOR 1/4W 15K	R167,176
MAIN	14-5182	RESISTOR 1/4W 1.8K	R126-133,164
MAIN	14-5183	RESISTOR 1/4W 18K	R161,171
MAIN	14-5271	RESISTOR 1/4W 270 OHM	R158
MAIN	14-5272	RESISTOR 1/4W 2.7K	R185
MAIN	14-5303	RESISTOR 1/4W 30K	R178
MAIN	14-5332	RESISTOR 1/4W 3.3K	R175
MAIN	14-5471	RESISTOR 1/4W 470 OHM	R156,184
MAIN	14-5472	RESISTOR 1/4W 4.7K	R170,174
MAIN	14-5473	RESISTOR 1/4W 47K	R124,125
MAIN	14-5474	RESISTOR 1/4W 470K	R183
MAIN	14-5623	RESISTOR 1/4W 62K	R180
MAIN	14-5682	RESISTOR 1/4W 6.8K	R166
MAIN	14-5912	RESISTOR 1/4W 9.1K	R163
MAIN	21-101473	CAP. POLY .047uF (100V)	C135-142,181
MAIN	31-IN914	DIODE 1N914	CR101,103
MAIN	33-2N3906	TRANSISTOR 2N3906	Q103,104,106
MAIN	34-2N3563	TRANSISTOR 2N3563	Q105
MAIN	34-2N3904	TRANSISTOR 2N3904	Q107
MAIN	C010727	CONNECTOR (9 PIN)	J101-104 (ALTERNATE
			FOR P/N C010448)
MAIN	C010816	HEX CMOS BUFFER (CD4050B)	A111
MAIN	C010821	CAP. POLY 820uF (50V)	C177,178

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UK

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PARTS LIST (cont)

<u>Assy</u>	Part No.	Description	Location
MAIN	C010823	INDUCTOR VARIABLE 0.6-1.2uH	L101
MAIN	C012285	CRYSTAL 3.546894 MHz	Y101
MAIN	C012294	IC POKEY	A101
MAIN	C012399	IC ROM	A105
MAIN	C014179-03	CAP. CERAMIC AXIAL 10pF (50V)	C187
MAIN	C014179-05	CAP. CERAMIC AXIAL 47pF (50V)	C183,194,196
MAIN	C014179-12	CAP. CERAMIC AXIAL 68pF (50V)	C193,195
MAIN	C014180-03	CAP. CERAMIC AXIAL 100pF (50V)	C185
MAIN	C014181-01	CAP. CERAMIC AXIAL	C101-125,127-134,
		.001uF (25V)	143-162,165-171,
			184,201
MAIN	C014181-02	CAP. CERAMIC AXIAL	173-176,180,
		.01uF (25V)	197-199
MAIN	C014181-03	CAP. CERAMIC AXIAL	C126,163,164,172,
		.1uF (25V)	179,182,186,188-191
			202
MAIN	C014322	CONNECTOR EDGE (22/44)	J109
MAIN	C014323	CONNECTOR EDGE (28/56)	J110
MAIN	C014336	IC 4051	Z101,102
MAIN	C014339	IC 74LS10	Z104
MAIN	C014344	IC 74LS138	Z105
MAIN	C014361	IC 74LS42	Z103
MAIN	C014371	CAP. ELEC AXIAL 10uF (16V)	C192
MAIN	C014379	RESISTOR NETWORK (9 X 4.7K)	R150,159
MAIN	C014380	INDUCTOR 22uH	L115-117
MAIN	C014384	INDUCTOR FERRITT BEAD	L103-114,118
MAIN	C014386-02	SOCKET IC (14 PIN)	Z104
MAIN	C014386-03	SOCKET IC (16 PIN)	A111,Z101-103,105
MAIN	C014386-07	SOCKET IC (24 PIN)	A103-105
MAIN	C014386-09	SOCKET IC (40 PIN)	A101,102
MAIN	C014389	Edge Connector (15/30)	J108
MAIN	C014394	TRANSISTOR MPS06	Q101 ·
MAIN	C014718-01	CONNECTOR HEADER (20 Pin)	J107
MAIN	C014720-01	HEADER RT ANGLE	J106
MAIN	C014778-02	CONNECTOR (22 PIN)	J105
MAIN	C014785	CONNECTOR SUPPORT BRACKET	
MAIN	C014795	IC PIA (6520)	A102 (ALTERNATE
		,	LISTED)
MAIN	C014796	FASTENER LATCHING	·
MAIN	C014809	TRANSISTOR (MPSA55)	0102
MAIN	C014812	IC PIA	A102 (ALTERNATE
	001.012		FOR P/N C014795)

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PARTS LIST (cont)

Assy	Part No.	Description	Location
MAIN	C015199	IC ROM - OS	A104
MAIN	C015299	IC ROM - OS	A103
MAIN	C015367	FISHPAPER INSULATOR	
MAIN	C015925	INDUCTOR AXIAL .83uH	L102
MAIN	C016326	PC BOARD STABILIZER	
MAIN	C060163-02	CAP. CERAMIC AXIAL .01uF	C203 (EPOXY INSULATED TYPE ONLY))
MAIN	CA011840	SPEAKER ASSY 63 OHM	
MAIN	CA015960	PC BOARD ASSY (400 MAIN Assy)	
MODULE	C014015	CASTING	
MODULE	C014017	BOTTOM COVER	
MODULE	CA014714	CASTING ASSY	
MODULE	CA016107-01	MODULE ASSY (16K)	
MODULE	CA017505-02	MODULE Assy (8K)	2001
PWR SUPP	14-5331	RESISTOR 1/4W 330 OHM	R201
PWR SUPP	14-2682	RESISTOR 1/4W 6.8K	R_{203}
PWR SUPP	C010173	SWITCH CHANNEL SELECT	for P/N C012242)
PWR SUPP	C010394	CAP. POLY FILM .22uF	C203,208,211
PWR SUPP	C012242	SWITCH CHANNEL SELECT	S201 (ALTERNATE LISTED)
PWR SUPP	C012995	CONNECTOR RT ANGLE (13 PIN)	J202
PWR SUPP	C014059	PC BOARD	
PWR SUPP	C014069	LED STANDOFF	
PWR SUPP	C014075	PLUNGER INTERLOCK SWITCH	
PWR SUPP	C014092	HEATSINK	
PWR SUPP	C014181-01	CAP. CERAMIC AXIAL .001uF (25V)	213
PWR SUPP	C014181-03	CAP. CERAMIC AXIAL .1uF (25V)	C206
PWR SUPP	C014348	VOLTAGE REGULATOR (5V) (7805)	A202
PWR SUPP	C014349	VOLTAGE REGULATOR (12V) (78M12)	A201
PWR SUPP	C014370	CAP. ELEC AXIAL 470uF (16V)	C201,202
PWR SUPP	C014371	CAP. ELEC AXIAL 10uF (16V)	C207
PWR SUPP	C014373	CAP. ELEC AXIAL 2200uF (16V)	C204,205
PWR SUPP	C014374-01	CAP. ELEC RADIAL 4700uF (16V)	C209 (ALTERNATE
PWR SUPP	C014374-02	CAP. ELEC RADIAL 4700uF (16V)	C209 (ALTERNATE
PWR SUPP	C014383	INDUCTOR AXIAL luH	L201
PWR SUPP	C014384	INDUCTOR FERRITT BEAD	L202-205
PWR SUPP	C014387	INTERLOCK SWITCH	S202
PWR SUPP	C014393	CAP. ELEC AXIAL 22uF (16V)	C210

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UK

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PARTS LIST (cont)

Assy	Part No.	Description	Location
PWR SUPP	C014397	SWITCH POWER	S203
PWR SUPP	C014715	POWER JACK	J204
PWR SUPP	C014716-02	CONNECTOR SOCKET	J201
PWR SUPP	C014718-03	CONNECTOR Header (5 Pin)	J203
PWR SUPP	C014771	RESISTOR 2W 33 OHM	R202
PWR SUPP	C014777	LED DIODE	CR210
PWR SUPP	C014796	FASTENER LATCHING	
PWR SUPP	C014808-01	DIODE ZENER IN5231B (5.IV)	CR201
PWR SUPP	C015344	RIVET NYLON	
PWR SUPP	C017988	DIODE (1N5391)	CR206-209
PWR SUPP	CA014708	HEATSINK ASSY	
PWR SUPP	CA016040	PC BOARD (POWER SUPPLY)	
RAM	14-5221	RESISTOR 14W 220 OHM	R501
RAM	C014179-05	CAP. CERAMIC AXIAL 47pF (50V)	C518
RAM	C014181-01	CAP. CERAMIC AXIAL .001uF (25V)	C521-523
RAM	C014181-02	CAP. CERAMIC AXIAL .01uF (25V)	C503,507,511,515
RAM	C014181-03	CAP. CERAMIC AXIAL .1uF (25V)	C501,502,504-506
			508-510,512-519
RAM	C014313	IC 74LS244	Z502
RAM	C014331	IC RAM	2505-512
RAM	C014339	IC 74LS10	Z501
RAM	C014345	IC 74LS158	Z503,504
RAM	C014386-02	SOCKET IC (14 PIN)	A 501
RAM	C014386-03	SOCKET IC (16 PIN)	A503-512
RAM	C014386-05	SOCKET IC (20 PIN)	A 502
RAM	C014804	INDUCTOR AXIAL LEAD 4.7uH	L501
RAM	CA014801-02	PC BOARD ASSY (8K)	
RAM	CA014802-01	PC BOARD ASSY (16K)	
RF MOD	C014716-04	CONNECTOR SOCKET (5 PIN)	
RF MOD	C016011	UHF MODULATOR	
KF MOD	C016042	PC BOARD	1 2) 7 2 2
RF MOD	CA015952-01	RF ADAPTOR PC BOARD ASSY (REV	V 2)TOP

PARTS LIST

Assy	Part No.	Description	Location
CPU	14-5102	RESISTOR 1/4W IK	R302-306,313
CPU	14-5103	RESISTOR 1/4W 10K	R314
CPU	14-51R0	RESISTOR 1/4W1 OHM	R317
CPU	14-5334	RESISTOR 1/4W 330K	R308
CPU	14-5471	RESISTOR 1/4W 470 OHM	R316
CPU	14-5472	RESISTOR 1/4W 4.7K	R301,307,310,
			311,312
CPU	14-5682	RESISTOR 1/4W 6.8K	R315
CPU	19-411504	RESISTOR VARIABLE 500K	R309
CPU	34-2N3904	TRANSISTOR 2N3904	Q301
CPU	C010821	CAP. POLY 820pF (50V)	C308
CPU	C014179-01	CAP. CERAMIC AXIAL 22pF (50V)	C309
CPU	C014179-14	CAP. CERAMIC AXIAL 56pF (50V)	C310
CPU	C014181-01	CAP. CERAMIC AXIAL	C307
CPU	C014181-02	CAP. CERAMIC AXIAI	C303 306
010	001/101 02	.01UF (25V)	0,0,,,,00
CPU	C014181-03	CAP. CERÀMIC AXIAL	C301,302,304,305
		.1UF (25V)	
CPU	C014313	IC 74LS244	Z302
CPU	C014386-02	SOCKET IC (14 Pin)	Z301,302
CPU	C014386-05	SOCKET IC (20 Pin)	Z303,304
CPU	C014386-09	SOCKET IC (40 Pin)	A301-303
CPU	C014806	IC 6502 (Modified)	A303
CPU	C014887	IC ANTIC (PAL)	A302
CPU	C014889	IC GTIA (PAL)	A301
CPU	C016045	IC 74LS74	Z301
CPU	C017222	INDUCTOR 1.5uH	L303
CPU	C017536	CRYSTAL 4.433618 MhZ	Y301
CPU	CA015967	PC BOARD (CPU)	
CABLE	78-24001	CABLE TIE	
CABLE	C010389	TORROID CORE	
CABLE	CA016234	COAXIAL CABLE ASSY	
CABLE	CA016294	CABLE ASSY	
CONSOLE	88-1006	RUBBER FEET	
CONSOLE	C014013	CONSOLE BASE	
CONSOLE	C014014	CONSOLE TOP	
CONSOLE	CA014782	CONSOLE ASSY (1/K)	
	CA016100-01	CONSOLE ASSY (16K) CONSOLE ASSY (97)	
CONSOLE	CA016100-02	CONSOLE BASE ASSY $(1/r)$	
CONSOLE		CONSOLE BASE ASSY (PV)	
DOOR	CAUIGIUI-UZ	CAPTRINCE DOOD	
DOOK	C014016	CARTRIDGE DOOR	

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PAL

PARTS LIST (cont)

Assy	Part No.	Description	Location
DOOR	C014018	DOOR LATCH	<i>,</i>
DOOR	C014017	DOOR SHIFLD	
DOOR	C014103	FOAM PAD	
DOOR	C014104	CARTRIDGE DOOR SPRING	
DOOR	CA014153	DOOR ASSY	
KEYBOARD	CA014031	KEYBOARD ASSY	REPLACEMENT LISTED
KEYBOARD	CA017999	KEYBOARD ASSY	(REPLACEMENT FOR
			P/N CA014031)
MAIN	14-5101	RESISTOR 1/4W 100 OHM	R101-118,155,157
MAIN	14-5102	RESISTOR 1/4W1K	R160,162,169,172
MAIN	14-5103	RESISTOR 1/4W 10K	R165
MAIN	14-5104	RESISTOR 1/4W 100K	R182
MAIN	14-5105	RESISTOR 1/4WIMEG	R181
MAIN	14-5123	RESISTOR 1/4W 12K	R168,173,176
MAIN	14-5124	RESISTOR 1/4W 120K	R179
MAIN	14-5151	RESISTOR 1/4W 150 OHM	R119-123,134-149
			151-154
MAIN	14-5153	RESISTOR 1/4W15K	R167,176
MAIN	14-5182	RESISTOR 1/4W 1.8K	R126-133,164
MAIN	14-5183	RESISTOR 1/4W 18K	R161,171
MAIN	14-5271	RESISTOR 1/4W 270 OHM	R158
MAIN	14-5272	RESISTOR 1/4W 2.7K	R185
MAIN	14-5303	RESISTOR 1/4W 30K	R178
MAIN	14-5332	RESISTOR 1/4W 3.3K	R175
MAIN	14-5471	RESISTOR 1/4W 470 OHM	R156,184
MAIN	14-5472	RESISTOR 1/4W 4.7K	R170,174
MAIN	14-5473	RESISTOR 1/4W 47K	R124,125
MAIN	14-5474	RESISTOR 1/4W 470K	R183
MAIN	14-5623	RESISTOR 1/4W 62K	R180
MAIN	14-5682	RESISTOR 1/4W 6.8K	R166
MAIN	14-5912	RESISTOR 1/4W 9.1K	R163
MAIN	21-101473	CAP. POLY .047uF (100V)	C135-142,181
MAIN	31-IN914	DIODE 1N914	CR101,103
MAIN	33-2N3906	TRANSISTOR 2N3906	Q103,104,106
MAIN	34-2N3563	TRANSISTOR 2N3563	Q105
MAIN	34-2N3904	TRANSISTOR 2N3904	Q107
MAIN	C010448	CONNECTOR SOLDER (9 PIN)	J101-104 (ALTERNATE
			LISTED)
MAIN	C010727	CONNECTOR (9 PIN)	J101-104 (ALTERNATE
			FOR P/N C010448)
MAIN	C010816	HEX CMOS BUFFER (CD4050B)	Alll
MAIN	C010821	CAP. POLY 820uF (50V)	C177,178

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PARTS LIST (cont)

MAIN C010823 INDUCTOR VARIABLE 0.6-1.2uH L101 MAIN C012285 CRYSTAL 3.546894 MHz A101 MAIN C012294 IC POKEY A101 MAIN C012399 IC ROM A105 MAIN C014179-03 CAP. CERAMIC AXIAL 470F (50V) C183,194,196 MAIN C014179-05 CAP. CERAMIC AXIAL 470F (50V) C183,194,196 MAIN C014180-03 CAP. CERAMIC AXIAL 470F (50V) C183,194,195 MAIN C014181-01 CAP. CERAMIC AXIAL C101-125,127-134, .001uF (25V) 143-162,165-171, MAIN C014181-02 CAP. CERAMIC AXIAL IT73-176,180, .01uF (25V) 197-199 MAIN C014181-03 CAP. CERAMIC AXIAL I73-176,180, .01uF (25V) 197-199 MAIN C014322 CONNECTOR EDGE (22/44) J109 202 MAIN C014323 CONNECTOR EDGE (22/44) J109 MAIN C014326 C 4051 Z104, MAIN C014336 IC 74L5138 Z103 MAIN C0143361 IC 74L5138 <th>Assy</th> <th>Part No.</th> <th>Description</th> <th>Location</th>	Assy	Part No.	Description	Location
MAIN C012285 CRYSTAL 3.546894 MHz Y101 MAIN C012294 IC POKEY A101 MAIN C012399 IC ROM A105 MAIN C014179-03 CAP. CERAMIC AXIAL 10pF (50V) C183,194,196 MAIN C014179-03 CAP. CERAMIC AXIAL 47pF (50V) C183,194,196 MAIN C014180-03 CAP. CERAMIC AXIAL 47pF (50V) C183,194,196 MAIN C014180-03 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014181-01 CAP. CERAMIC AXIAL 100pF (50V) C184 MAIN C014181-02 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014181-03 CAP. CERAMIC AXIAL 100pF (50V) C184 MAIN C014181-03 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014181-03 CAP. CERAMIC AXIAL 179,179,182,186,188-191, 202 103 MAIN C014322 CONNECTOR EDGE (22/44) 1109 MAIN C014326 IC 74LS10 Z104 MAIN C014336 IC 74LS13 Z105 MAIN C01	MAIN	C010823	INDUCTOR VARIABLE 0.6-1.2uH	L101
MAIN MAIN MAIN MAIN C012399 IC POKEY IC ROM CROM CROM C014179-03 Al01 CROM CAP, CERAMIC AXIAL 10pF (50V) C1837 C183194,196 C183194,196 MAIN MAIN C014179-03 CAP, CERAMIC AXIAL 47pF (50V) C1837 C183,194,196 C183,194,196 MAIN MAIN C014179-03 CAP, CERAMIC AXIAL 45pF (50V) C1837 C183,194,196 C183,194,196 MAIN C014181-01 CAP, CERAMIC AXIAL 100pF (50V) MAIN C014181-02 CAP, CERAMIC AXIAL C20, CERAMIC AXIAL 010F (25V) C101-125,127-134, 143-162,165-171, 184,201 MAIN C014181-02 CAP, CERAMIC AXIAL 010F (25V) 173-176,180, 197-199 MAIN C014181-03 CAP, CERAMIC AXIAL 010F (25V) C197-199 MAIN C014322 CONNECTOR EDGE (22/44) J109 MAIN C014336 C4951 Z101,102 MAIN C014336 C74L510 Z104 MAIN C014336 C74L513 Z105 MAIN C014336 CAP, ELEC AXIAL 100F (16V) C192 MAIN C014336 INDUCTOR FERRITT BEAD L103-114,118 MAIN C014386-03 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (24 PIN) A103,105 MAIN C014386-03 SOCKET IC (14 PIN) A101,120 <t< td=""><td>MAIN</td><td>C012285</td><td>CRYSTAL 3.546894 MHz</td><td>Y101</td></t<>	MAIN	C012285	CRYSTAL 3.546894 MHz	Y101
MAIN MAIN MAIN C014179-05 IC ROM CAP. CERAMIC AXIAL 10PF (50V) CAP. CERAMIC AXIAL 47PF (50V) C183,194,196 A105 MAIN MAIN C014179-05 CAP. CERAMIC AXIAL 47PF (50V) C183,194,196 C183,194,196 C183,194,196 MAIN MAIN C014180-03 CAP. CERAMIC AXIAL 68pF (50V) MAIN C014181-01 CAP. CERAMIC AXIAL C010-125,127-134, .001uF (25V) C101-125,127-134, .001uF (25V) MAIN C014181-02 CAP. CERAMIC AXIAL .01uF (25V) C101-125,127-134, .01uF (25V) 143-162,165-171, .148,201 MAIN MAIN C014181-02 CAP. CERAMIC AXIAL .01uF (25V) 179,182,186,188-191, .01uF (25V) 202 MAIN MAIN C014322 CONNECTOR EDGE (22/44) J109 J104 MAIN C014323 CONNECTOR EDGE (28/56) J110 J102 MAIN C014336 IC 74L513 Z104 J109 MAIN C014344 IC 74L5138 Z105 J104 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014384 INDUCTOR Z2uH L115-117 MAIN C014386-02 SOCKET IC (14 PIN) A103-105 MAIN C014386-03 SOCKET IC (14 PIN) A103-105 MAIN C014386-03 SOCKET IC (14 PIN) A104,102	MAIN	C012294	IC POKEY	A101
MAIN MAIN MAIN MAIN C014179-05 CAP. CERAMIC AXIAL 10pF (50V) C183, 194, 196 C187 CAP. CERAMIC AXIAL 47pF (50V) C183, 194, 196 MAIN MAIN MAIN MAIN C014180-03 CAP. CERAMIC AXIAL 47pF (50V) C193, 195 C193, 195 MAIN MAIN MAIN MAIN C014181-01 CAP. CERAMIC AXIAL 100pF (50V) CAP. CERAMIC AXIAL 001uF (25V) C191-125, 127-134, 148, 201 MAIN MAIN MAIN C014181-02 CAP. CERAMIC AXIAL 0.01uF (25V) 143-162, 165-171, 184, 201 MAIN MAIN C014181-03 CAP. CERAMIC AXIAL 0.01uF (25V) 173-176, 180, 197-199 MAIN MAIN C014322 CONNECTOR EDGE (22/44) 1109 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014336 IC 4051 Z101, 102 MAIN C014336 IC 74L510 Z104 MAIN C014336 IC 74L513 Z105 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (24 PIN) A103-105 MAIN C014386-03 SOCKET IC (24 PIN) A103, 102 MAIN C014386-03 SOCKET IC (24 PIN) A103, 105 MAIN C014386-03 SOCKET IC (24 PIN) A101, 102 <td>MAIN</td> <td>C012399</td> <td>IC ROM</td> <td>A105</td>	MAIN	C012399	IC ROM	A105
MAIN MAIN C014179-05 C014179-12 CAP. CERAMIC AXIAL 47pF (50V) C193,195 C183,194,196 MAIN C014180-03 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014180-03 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014181-01 CAP. CERAMIC AXIAL C101-125,127-134, .001uF (25V) 184,201 MAIN C014181-02 CAP. CERAMIC AXIAL 173-176,180, .01uF (25V) 197-199 MAIN C014181-03 CAP. CERAMIC AXIAL C126,163,164,172, .1uF (25V) 197-199 MAIN C014322 CONNECTOR EDGE (22/44) J109 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014344 IC 74LS10 Z104 MAIN C014361 IC 74LS138 Z105 MAIN C014379 RESISTOR NETWORK (9 X 4.7K) R150,159 MAIN C014386-03 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (24 PIN) A103-105 MAIN C014386-03	MAIN	C014179-03	CAP. CERAMIC AXIAL 10pF (50V)	C187
MAIN C014179-12 CAP. CERAMIC AXIAL 68PF (50V) C193,195 MAIN C014180-03 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014181-01 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014181-01 CAP. CERAMIC AXIAL 100pF (50V) 143-162,165-171, 184,201 MAIN C014181-02 CAP. CERAMIC AXIAL 173-176,180, .01uF (25V) 197-199 MAIN C014181-03 CAP. CERAMIC AXIAL C126,163,164,172, .1uF (25V) 179,182,186,188-191, .0202 MAIN C014322 CONNECTOR EDGE (22/44) J109 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014336 IC 4051 Z101,102 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014384 INDUCTOR Z2uH L105-117 MAIN C014386-03 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (24 PIN) A103,-103,1	MAIN	C014179-05	CAP. CERAMIC AXIAL 47pF (50V)	C183,194,196
MAIN C014180-03 CAP. CERAMIC AXIAL 100pF (50V) C185 MAIN C014181-01 CAP. CERAMIC AXIAL C101-125,127-134, .001uF (25V) 143-162,165-171, 184,201 MAIN C014181-02 CAP. CERAMIC AXIAL 173-176,180, .01uF (25V) 197-199 MAIN C014181-03 CAP. CERAMIC AXIAL C126,163,164,172, .1uF (25V) 197-199 MAIN C014322 CONNECTOR EDGE (22/44) J109 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014336 IC 4051 Z101,102 MAIN C014344 IC 74LS10 Z104 MAIN C014361 IC 74LS138 Z105 MAIN C014379 RESISTOR NETWORK (9 X 4.7K) R150,159 MAIN C014386 INDUCTOR 22uH L115-117 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (24 PIN) A103-105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-09 SOCKET IC (24 PIN) A1	MAIN	C014179-12	CAP. CERAMIC AXIAL 68pF (50V)	C193,195
MAIN C014181-01 CAP. CERAMIC AXIAL C101-125,127-134, 143-162,165-171, 184,201 MAIN C014181-02 CAP. CERAMIC AXIAL 173-176,180, 197-199 MAIN C014181-03 CAP. CERAMIC AXIAL 173-176,180, 197-199 MAIN C014181-03 CAP. CERAMIC AXIAL C126,163,164,172, 10F (25V) MAIN C014322 CONNECTOR EDGE (22/44) J109 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014336 IC 4051 Z101,102 MAIN C014361 IC 74LS138 Z105 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014384 INDUCTOR Z2uH L115-117 MAIN C014384 INDUCTOR FERRITT BEAD L103-114,118 MAIN C014384 INDUCTOR FERRITT BEAD L103-105-114,118 MAIN C014386-03 SOCKET IC (14 PIN) A104,102 MAIN C014386-03 SOCKET IC (24 PIN) A103-105 MAIN C014386-03 SOCKET IC (24 PIN) A103,105 MAIN C014386-03 SOCKET IC (24 PIN) A101,102	MAIN	C014180-03	CAP. CERAMIC AXIAL 100pF (50V)	C185
.001uF (25V) 143-162,165-171, 184,201 MAIN C014181-02 CAP. CERAMIC AXIAL 173-176,180, .01uF (25V) MAIN C014181-03 CAP. CERAMIC AXIAL C126,163,164,172, .1uF (25V) MAIN C014322 CONNECTOR EDGE (22/44) J109 MAIN C014322 CONNECTOR EDGE (28/56) J110 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014336 IC 4051 Z101,102 MAIN C014344 IC 74LS10 Z104 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014379 RESISTOR NETWORK (9 X 4.7K) R150,159 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (24 PIN) A103-105 MAIN C014386-07 SOCKET IC (24 PIN) A101,102 MAIN C014386-03 SOCKET IC (24 PIN) A103-105 MAIN C014386-04 SOCKET IC (24 PIN) A103-105 <td>MAIN ⁻</td> <td>C014181-01</td> <td>CAP. CERAMIC AXIAL</td> <td>C101-125,127-134,</td>	MAIN ⁻	C014181-01	CAP. CERAMIC AXIAL	C101-125,127-134,
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MAIN C014181-02 CAP. CERAMIC AXIAL 173-176,180, .01uF (25V) 197-199 MAIN C014181-03 CAP. CERAMIC AXIAL C126,163,164,172, .1uF (25V) 179,182,186,188-191, 202 MAIN C014322 CONNECTOR EDGE (22/44) J109 MAIN C014323 CONNECTOR EDGE (28/56) J110 MAIN C014336 IC 4051 Z101,102 MAIN C014339 IC 74LS10 Z104 MAIN C014361 IC 74LS138 Z105 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014379 RESISTOR NETWORK (9 X 4.7K) R150,159 MAIN C014380 INDUCTOR 22uH L103-114,118 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (14 PIN) A103-105 MAIN C014386-03 SOCKET IC (24 PIN) A103-105 MAIN C014386-09 SOCKET IC (24 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C014386-09 SOCKET IC (24 PIN) A101,102 MAI				184,201
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	MAIN	C014181-03	CAP. CERAMIC AXIAL	C126.163.164.172.
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MAIN C014339 IC 74LS10 Z104 MAIN C014344 IC 74LS138 Z105 MAIN C014361 IC 74LS138 Z103 MAIN C014361 IC 74LS12 Z103 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014379 RESISTOR NETWORK (9 X 4.7K) R150,159 MAIN C014380 INDUCTOR 22uH L115-117 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (14 PIN) Z104 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-07 SOCKET IC (24 PIN) A101,102 MAIN C014386-09 SOCKET IC (40 PIN) A101,102 MAIN C014386-09 SOCKET IC (40 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C01478-01 CONNECTOR HEADER (20 Pin) J107 MAIN C014778-02 CONNECTOR SUPPORT BRACKET MAIN <	MAIN	C014336	IC 4051	Z101.102
MAIN C014344 IC 74LS138 Z105 MAIN C014361 IC 74LS42 Z103 MAIN C014371 CAP. ELEC AXIAL 10uF (16V) C192 MAIN C014379 RESISTOR NETWORK (9 X 4.7K) R150,159 MAIN C014380 INDUCTOR 22uH L115-117 MAIN C014384 INDUCTOR FERRITT BEAD L103-114,118 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (16 PIN) A111,Z101-103,105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-09 SOCKET IC (24 PIN) A101,102 MAIN C014386-09 SOCKET IC (40 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C014389 Edge Connector (15/30) J107 MAIN C01478-01 CONNECTOR HEADER (20 Pin) J107 MAIN C01478-01 CONNECTOR SUPPORT BRACKET A102 (ALTERNATE MAIN C014795 IC PIA (6520) A102 (ALTERNATE MAIN C014796 FASTENER LATCHING </td <td>MAIN</td> <td>C014339</td> <td>IC 74LS10</td> <td>Z104</td>	MAIN	C014339	IC 74LS10	Z104
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MAIN C014379 RESISTOR NETWORK (9 X 4.7K) R150,159 MAIN C014380 INDUCTOR 22uH L115-117 MAIN C014384 INDUCTOR FERRITT BEAD L103-114,118 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (16 PIN) A111,Z101-103,105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-09 SOCKET IC (40 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C014394 TRANSISTOR MP506 Q101 MAIN C014718-01 CONNECTOR HEADER (20 Pin) J107 MAIN C014778-02 CONNECTOR SUPPORT BRACKET A102 (ALTERNATE MAIN C014795 IC PIA (6520) A102 (ALTERNATE MAIN C014796 FASTENER LATCHING A102 (ALTERNATE MAIN C014812 IC PIA A102 (ALTERNATE	MAIN	C014371	CAP. ELEC AXIAL 10uF (16V)	C192
MAIN C014380 INDUCTOR 22uH L115-117 MAIN C014384 INDUCTOR FERRITT BEAD L103-114,118 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (16 PIN) A111,Z101-103,105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-07 SOCKET IC (24 PIN) A101,102 MAIN C014386-09 SOCKET IC (40 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C014394 TRANSISTOR MPS06 Q101 MAIN C014718-01 CONNECTOR HEADER (20 Pin) J107 MAIN C014720-01 HEADER RT ANGLE J106 MAIN C014778-02 CONNECTOR SUPPORT BRACKET A102 (ALTERNATE MAIN C014795 IC PIA (6520) A102 (ALTERNATE MAIN C014796 FASTENER LATCHING A102 (ALTERNATE MAIN C014809 TRANSISTOR (MPSA55) Q102 MAIN C014812 IC PIA A102 (ALTERNATE	MAIN	C014379	RESISTOR NETWORK (9 X 4.7K)	R150.159
MAIN C014384 INDUCTOR FERRITT BEAD L103-114,118 MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (16 PIN) A111,2101-103,105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-09 SOCKET IC (24 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C014394 TRANSISTOR MPS06 Q101 MAIN C014718-01 CONNECTOR HEADER (20 Pin) J107 MAIN C014720-01 HEADER RT ANGLE J106 MAIN C01478-02 CONNECTOR SUPPORT BRACKET A102 (ALTERNATE MAIN C014785 CONNECTOR SUPPORT BRACKET A102 (ALTERNATE MAIN C014796 FASTENER LATCHING A102 (ALTERNATE MAIN C014809 TRANSISTOR (MPSA55) Q102 MAIN C014812 IC PIA A102 (ALTERNATE	MAIN	C014380	INDUCTOR 220H	L115-117
MAIN C014386-02 SOCKET IC (14 PIN) Z104 MAIN C014386-03 SOCKET IC (16 PIN) A111,Z101-103,105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-09 SOCKET IC (24 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C014394 TRANSISTOR MPS06 Q101 MAIN C014718-01 CONNECTOR HEADER (20 Pin) J107 MAIN C014720-01 HEADER RT ANGLE J106 MAIN C014778-02 CONNECTOR SUPPORT BRACKET M102 (ALTERNATE MAIN C014795 IC PIA (6520) A102 (ALTERNATE MAIN C014796 FASTENER LATCHING A102 (ALTERNATE MAIN C014812 IC PIA A102 (ALTERNATE	MAIN	C014384	INDUCTOR FERRITT BEAD	L103-114-118
MAIN C014386-03 SOCKET IC (16 PIN) A111,Z101-103,105 MAIN C014386-07 SOCKET IC (24 PIN) A103-105 MAIN C014386-09 SOCKET IC (40 PIN) A101,102 MAIN C014389 Edge Connector (15/30) J108 MAIN C014394 TRANSISTOR MPS06 Q101 MAIN C014718-01 CONNECTOR HEADER (20 Pin) J107 MAIN C014720-01 HEADER RT ANGLE J106 MAIN C014778-02 CONNECTOR (22 PIN) J105 MAIN C014785 CONNECTOR SUPPORT BRACKET A102 (ALTERNATE MAIN C014795 IC PIA (6520) A102 (ALTERNATE MAIN C014809 TRANSISTOR (MPSA55) Q102 MAIN C014812 IC PIA A102 (ALTERNATE	MAIN	C014386-02	SOCKET IC (14 PIN)	Z104
MAINC014386-07SOCKET IC (24 PIN)A103-105MAINC014386-09SOCKET IC (40 PIN)A101,102MAINC014389Edge Connector (15/30)J108MAINC014394TRANSISTOR MPS06Q101MAINC014718-01CONNECTOR HEADER (20 Pin)J107MAINC014720-01HEADER RT ANGLEJ106MAINC014778-02CONNECTOR (22 PIN)J105MAINC014785CONNECTOR SUPPORT BRACKETA102 (ALTERNATEMAINC014795IC PIA (6520)A102 (ALTERNATEMAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE	MAIN	C014386-03	SOCKET IC (16 PIN)	A111.7101-103.105
MAINC014386-09SOCKET IC (40 PIN)A101,102MAINC014389Edge Connector (15/30)J108MAINC014394TRANSISTOR MPS06Q101MAINC014718-01CONNECTOR HEADER (20 Pin)J107MAINC014720-01HEADER RT ANGLEJ106MAINC014778-02CONNECTOR (22 PIN)J105MAINC014785CONNECTOR SUPPORT BRACKETA102 (ALTERNATEMAINC014795IC PIA (6520)A102 (ALTERNATEMAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE	MAIN	C014386-07	SOCKET IC (24 PIN)	A103-105
MAINC014389Edge Connector (15/30)J108MAINC014394TRANSISTOR MPS06Q101MAINC014718-01CONNECTOR HEADER (20 Pin)J107MAINC014720-01HEADER RT ANGLEJ106MAINC014778-02CONNECTOR (22 PIN)J105MAINC014785CONNECTOR SUPPORT BRACKETA102 (ALTERNATEMAINC014795IC PIA (6520)A102 (ALTERNATEMAINC014796FASTENER LATCHINGA102 (ALTERNATEMAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE	MAIN	C014386-09	SOCKET IC (40 PIN)	A101.102
MAINC014394TRANSISTORMPS06Q101MAINC014718-01CONNECTOR HEADER (20 Pin)J107MAINC014720-01HEADER RT ANGLEJ106MAINC014778-02CONNECTOR (22 PIN)J105MAINC014785CONNECTOR SUPPORT BRACKETMAINC014795IC PIA (6520)A102 (ALTERNATEMAINC014796FASTENER LATCHINGLISTED)MAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE	MAIN	C014389	Edge Connector $(15/30)$.1108
MAINC014718-01CONNECTOR HEADER (20 Pin)J107MAINC014720-01HEADER RT ANGLEJ106MAINC014778-02CONNECTOR (22 PIN)J105MAINC014785CONNECTOR SUPPORT BRACKETMAINC014795IC PIA (6520)A102 (ALTERNATEMAINC014796FASTENER LATCHINGMAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE	MAIN	C014394	TRANSISTOR MPS06	0101
MAINC014720-01HEADER RT ANGLEJ106MAINC014778-02CONNECTOR (22 PIN)J105MAINC014785CONNECTOR SUPPORT BRACKETMAINC014795IC PIA (6520)A102 (ALTERNATEMAINC014796FASTENER LATCHINGMAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE	MAIN	C014718-01	CONNECTOR HEADER (20 Pin)	1107
MAINC014778-02CONNECTOR (22 PIN)J105MAINC014785CONNECTOR SUPPORT BRACKETJ105MAINC014795IC PIA (6520)A102 (ALTERNATEMAINC014796FASTENER LATCHINGLISTED)MAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE	MAIN	C014720-01	HEADER RT ANGLE	1106
MAINC014785CONNECTOR SUPPORT BRACKETMAINC014795IC PIA (6520)A102 (ALTERNATE LISTED)MAINC014796FASTENER LATCHINGMAINC014809TRANSISTOR (MPSA55)Q102 A102 (ALTERNATE FOR P/N C014795)	MAIN	C014778-02	CONNECTOR (22 PIN)	1105
MAINC014795IC PIA (6520)A102 (ALTERNATE LISTED)MAINC014796FASTENER LATCHINGMAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATE FOR P/N C014795)	MAIN	C014785	CONNECTOR SUPPORT BRACKET	5102
MAINC014796FASTENER LATCHINGLISTED)MAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATEFOR P/N C014795)	MAIN	C014795	IC PIA (6520)	A102 (ALTERNATE
MAINC014796FASTENER LATCHINGMAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATEFOR P/N C014795)		001/////	10 1 11 (0)20)	LISTED)
MAINC014809TRANSISTOR (MPSA55)Q102MAINC014812IC PIAA102 (ALTERNATEFOR P/N C014795)	MAIN	C014796	FASTENER LATCHING	
MAIN C014812 IC PIA A102 (ALTERNATE FOR P/N C014795)	MAIN	C014809	TRANSISTOR (MPSA55)	0102
FOR P/N C014795)	MAIN	C014812	IC PIA	A102 (ALTERNATE
		Q41.016		FOR P/N C014795)

ATARI Home Computer

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PARTS LIST (cont)

Assy	Part No.	Description	Location
MAIN	C015199	IC ROM - OS	A104
MAIN	C015299	IC ROM - OS	A103
MAIN	C015367	NDUCTOR AVIAL \$2	1102
MAIN	C015725	PC BOARD STABILIZER	L102
MAIN	C060163-02	CAP. CERAMIC AXIAL .01uF	C203 (EPOXY INSULATED TYPE ONLY))
MAIN	CA011840	SPEAKER ASSY 63 OHM	•
MAIN	CA015960	PC BOARD ASSY (400 MAIN Assy)	
MODULE	C014017	BOTTOM COVER	
MODULE	C014075	CASTING ASSV	
MODULE	CA016098-01	MODULE ASSY (16K)	
MODULE	CA016098-02	MODULE ASSY (8K)	
PWR SUPP	14-5331	RESISTOR 1/4W 330 OHM	R201
PWR SUPP	14-5682	RESISTOR 1/4W 6.8K	R203
PWR SUPP	31-1N4001	DIODE 1N4001	CR202-209
PWR SUPP	79-5903	CONNECTOR PHONO JACK	
PWR SUPP	C010173	SWITCH CHANNEL SELECT	S201 (Replacement for P/N C012242)
PWR SUPP	C010394 -	CAP. POLY FILM .22uF	C203.208.211
PWR SUPP	C012242	SWITCH CHANNEL SELECT	S201 (ALTERNATE
			LISTED)
PWR SUPP	C012995	CONNECTOR RT ANGLE (13 PIN)	J202
PWR SUPP	C014059	PC BOARD	
PWR SUPP	C014069	LED STANDOFF	
PWR SUPP	C014092		212
PWR SUPP	014181-01	.001uF (25V)	215
PWR SUPP	C014181-03	CAP. CERAMIC AXIAL .1uF (25V)	C206
PWR SUPP	C014348	VOLTAGE REGULATOR (5V) (7805)	A202
PWR SUPP	C014349	VOLTAGE REGULATOR (12V)	A201
PWR SUPP	C014370	CAP, ELEC AXIAL 470uF (16V)	C201.202
PWR SUPP	C014371	CAP. ELEC AXIAL 10uF (16V)	C207
PWR SUPP	C014373	CAP. ELEC AXIAL 2200uF (16V)	C204,205
PWR SUPP	C014374-01	CAP. ELEC RADIAL 4700uF (16V)	C209 (ALTERNATE FOR P/N C014374-02)
PWR SUPP	C014374-02	CAP. ELEC RADIAL 4700uF (16V)	C209 (ALTERNATE
PWR SHPP	C014383	INDUCTOR AXIAL WH	L201
PWR SUPP	C014384	INDUCTOR FERRITT BEAD	L202-205
PWR SUPP	C014387	INTERLOCK SWITCH	S202
PWR SUPP	C014393	CAP. ELEC AXIAL 22uF (16V)	C210

PARTS LIST (cont)

Assy	Part No.	Description	Location
PWR SUPP	C014397	SWITCH POWER	S203
PWR SUPP	C014715	POWER JACK	J204
PWR SUPP	C014716-02	CONNECTOR SOCKET	J201
PWR SUPP	C014718-03	CONNECTOR Header (5 Pin)	J203
PWR SUPP	C014771	RESISTOR 2W 33 OHM	R202
PWR SUPP	C014777	LED DIODE	CR210
PWR SUPP	C014796	FASTENER LATCHING	
PWR SUPP	C014808-01	DIODE ZENER IN5231B (5.IV)	CR201
PWR SUPP	C015344	RIVET NYLON	
PWR SUPP	CA014155	PC BOARD (POWER SUPPLY)	
PWR SUPP	C017988	DIODE (1N5391)	CR206-209
PWR SUPP	CA014708	HEATSINK ASSY	
RAM	14-5221	RESISTOR 14W 220 OHM	R <i>5</i> 01
RAM	C014179-05	CAP. CERAMIC AXIAL 47pF (50V)	C518
RAM	C014181-01	CAP. CERAMIC AXIAL .001uF (25V)	C521-523
RAM	C014181-02	CAP. CERAMIC AXIAL .01uF (25V)	C503.507.511.515
RAM	C014181-03	CAP. CERAMIC AXIAL .1uF (25V)	C501,502,504-506
			508-510,512-519
RAM	C014313	IC 74LS244	Z502
RAM	C014331	IC RAM	Z505-512
RAM	C014339	IC 74LS10	Z501
RAM	C014345	IC 74LS158	2503,504
RAM	C014386-02	SOCKET IC (14 PIN)	A 501
RAM	C014386-03	SOCKET IC (16 PIN)	A503-512
RAM	C014386-05	SOCKET IC (20 PIN)	A 502
RAM	C014804	INDUCTOR AXIAL LEAD 4.7uH	L501
RAM	CA014801-02	PC BOARD ASSY (8K)	
RAM	CA014802-01	PC BOARD ASSY (16K)	
RF MOD	C010470	SHIELD	
RF MOD	C010471	COVER	
RF MOD	C016071	RF MODULE	
KF MOD	CA012174	RF MODULE "B" ASSY	
KF MOD	CAU12175	PC BOARD	

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PAL

PARTS LIST

Assy	Part No.	Description	Location
CPU	14-5102	RESISTOR 1/4W IK	R302-306,313
CPU	14-5103	RESISTOR 1/4W 10K	R314
CPU	14-51R0	RESISTOR 1/4W10HM	R317
CPU	14-5334	RESISTOR 1/4W 330K	R308
CPU	14-5471	RESISTOR 1/4W 470 OHM	R316
CPU	14-5472	RESISTOR 1/4W 4.7K	R301,307,310,311
			312
CPU	14-5682	RESISITOR 1/4W 6.8K	R315
CPU	19-411504	RESISTOR VARIABLE 500K	R309
CPU	34-2N3904	TRANSISTOR 2N3904	Q301
CPU	C010821	CAP. POLY 820pF (50V)	C308
CPU	C014179-01	CAP. CERAMIC AXIAL 22pF (50V)	C309
CPU	C014179-14	CAP. CERAMIC AXIAL 56pF (50V)	C310
CPU	C014181-01	CAP. CERAMIC AXIAL	C307
		.001uF (25V)	
CPU	C014181-02	CAP. CERAMIC AXIAL	C303,306
		.01uF (25V)	
CPU	C014181-03	CAP. CERAMIC AXIAL .1uF (25V)	C301,302,304,305
CPU	C014313	IC 74LS244	Z302
CPU	C014386-02	SOCKET IC (14 PIN)	Z301,302
CPU	C014386-05	SOCKET IC (20 PIN)	Z303,304
CPU	C014386-09	SOCKET IC (40 PIN)	A301-303
CPU	C014806	IC MPU (6502 Modified)	A303
CPU	C014887	IC ANTIC (PAL)	A302
CPU	C014889	IC GTIA (PAL)	A301
CPU	C016045	IC 74LS74	Z301
CPU	C016074	NEOPRENE PAD	
CPU	C017222	Inductor 1.5uH	L303
CPU	C017536	CRYSTAL 4.433618 Mhz	Y301
CPU	CA015967	PC BOARD ASSY (CPU PAL/UK)	
CABLE	78-24001	CABLE TIE	
CABLE	C010389	TORROID CORE	
CABLE	CA016234	COAXIAL CABLE	
CABLE	CA016294	CABLE ASSY (UK)	
CONSOLE	88-1006	RUBBER FEET	
CONSOLE	C012947	TOP COVER	
CONSOLE	C012948	LOWER COVER	
CONSOLE	C012970	LATCH	
CONSOLE	C012971	ACTUATOR	
CONSOLE	C012991	LENS	
CONSOLE	C014170	SPRING LATCH	
CONSOLE	CA014115	TOP COVER ASSY	

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PARTS LIST (cont)

Assy	Part No.	Description	Location
CONSOLE CONSOLE DOOR DOOR DOOR DOOR DOOR DOOR DOOR DOO	CA016209-03 CA016218-02 CA016218-03 C012778 C012779 C012939 C012940 C014093 C014843 C014847-01 C014847-02 C015324 CA014038 CA014848 CA016238-01 CA016238-02	LOWER COVER ASSY CONSOLE ASSY CONSOLE ASY REAR SHIELD CARTRIDGE SHIELD CARTRIDGE COVER REAR COVER SPRING INNER SHIELD FOAM STRIP FOAM STRIP FOAM STRIP PAD DOOR ASSY SHIELD ASSY ATARI 800/UK COMPUTER (16K) ATARI 800/UK COMPUTER (8K)	
KEYBOARD	C014710-03	CONNECTOR HOUSING (18 PIN)	
KEYBOARD	CA012952-02	KEYBOARD ASSY	PRESENT VERSION
			(MULTICOLOR RIBBON)
KEYBOARD	CA015319	CABLE ASSY	
MAIN	14-5101	RESISTOR 1/4W 100 OHM	R101,105,107, 110-126,168-174, 184-187
MAIN	14-5102	RESISTOR 1/4W IK	R102,157,160,162, 165,166,199,202
MAIN	14-5103	RESISTOR 1/4W 10K	R161,198
MAIN	14-5104	RESISTOR 1/4W 100K	R155
MAIN	14-5105	RESISTOR 1/4W1 MEG	R154
MAIN	14-5121	RESISTOR 1/4W 120 OHM	R201
MAIN	14-5182	RESISTOR 1/4W 1.8K	R130-137,190
MAIN	14-5183	RESISTOR 1/4W 18K	R167,181,191,206
MAIN	14-5221	RESISTOR 1/4W 220 OHM	R138-153,175-178,
MAIN	14-5222	RESISTOR 1/4W 2.2K	200 R163.179
MAIN	14-5271	RESISTOR 1/4W 270 OHM	R106.203
MAIN	14-5272	RESISTOR 1/4W 2.7K	R159
MAIN	14-5332	RESISTOR 1/4W 3.3K	R164,196
MAIN	14-5363	RESISTOR 1/4W 36K	R180
MAIN	14-5392	RESISTOR 1/4W 3.9K	R205

PARTS LIST (cont)

Assy	Part No.	Description	Location
MAIN	14-5471	RESISTOR 1/4W 470 OHM	R104
MAIN	14-5472	RESISTOR 1/4W 4.7K	R183,192-195,197
MAIN	14-5473	RESISTOR 1/4W 47K	R127,128
MAIN	14-5474	RESISTOR 1/4W 470K	R156
MAIN	14-5681	RESISTOR 1/4W 680 OHM	R103,108,109
MAIN	14-5750	RESISTOR 1/4W 75 OHM	R189,204
MAIN	14-5912	RESISTOR 1/4W 9.1K	R182.188
MAIN	21-101473	CAP. MYLAR .047UF (100V)	C127-134
			(ALTERNATED LISTED)
MAIN	31-1N914	DIODE 1N914	CR101,102,104-108
MAIN	33-2N3906	TRANSISTOR 2N3906	Q102,103107
MAIN	34-2N3563	TRANSISTOR 2N3563	Õ106
MAIN	34-2N3904	TRANSISTOR 2N3904	Õ101.104.105
MAIN	C010174	TRANSISTOR ARRAY	À104
MAIN	C010394	CAP. POLY FILM .22uF (100V)	C103.180
Main	C010448	CONNECTOR SOLDER RT ANGLE	J110-113
		(9 Pin)	(ALTERNATED LISTED)
MAIN	C010727	CONNECTOR RT ANGLE (9 PIN)	J110-113
			(ALTERNATE LISTED
			FOR P/N C010448))
MAIN	C010816	HEX CMOS (4050B)	A103
MAIN	C010821	CAP. POLY 820pF (50V)	C169.173
MAIN	C010823	INDUCTOR VARIABLE 0.6-1.20H	L101
MAIN	C012285	CRYSTAL 3.546894 MHZ	X101
MAIN	C012294	IC POKEY	A101
MAIN	C014179-02	CAP. CERAMIC AXIAL 47pF (50V)	C171
MAIN	C014179-03	CAP. CERAMIC AXIAL 10pF (50V)	C161
MAIN	C014179-04	CAP. CERAMIC AXIAL 33pF (50V)	C163
MAIN	C014180-03	CAP. CERAMIC AXIAL 100pF (50V)	C164.170
MAIN	C014180-05	CAP. CERAMIC AXIAL 200pF (50V)	C174-176
MAIN	C014180-09	CAP. CERAMIC AXIAL .047uF (50V)	C127-134 (ALTERNATE
			FOR P/N 21-101473)
MAIN	C014181-01	CAP. CERAMIC AXIAL .001uF (25V)	C104-121.123.
			135-160-165-177-178
			182-188,194-197.
			200
MAIN	C014181-02	CAP. CERAMIC AXIAL .010F (25V)	C101.124.125
	0011101 02		190-193
MAIN	C014181-03	CAP, CERAMIC AXIAL, JUE (25V)	C122.126.162.172.
			181.189.198
MAIN	C014181-05	CAP. CERAMIC AXIAL .22uF (25V)	C103.180 (ALTERNATE
			FOR P/N C010394)
MAIN	CO14322	CONNECTOR EDGE (22/44)	J102-104,107
MAIN	C014323	CONNECTOR EDGE (28/56)	J101

PARTS LIST (cont)

Assy	Part No.	Description	Location
MAIN	C014336	IC (CD4051)	Z103,104
MAIN	C014347	IC 74LS243	Z105,106
MAIN	C014361	IC 74LS42	Z101
MAIN	C014362	IC 74LS32	· Z102
MAIN	C014371	CAP. ELEC AXIAL 10UF (16V)	C199
MAIN	C014379	RESISTOR (9 x 4.7K)	R129,158
MAIN	C014384	INDUCTOR FERRITT BEAD	L103-112
MAIN	C014386-02	SOCKET IC (14 PIN)	Z105-106,A103-104
MAIN	C014386-03	SOCKET IC (16 PIN)	Z101-104
MAIN	C014386-09	SOCKET IC (40 PIN)	A101,102
MAIN	C014389	CONNECTOR EDGE (15/30)	J108,109
MAIN	C014392	CAP. ELEC RADIAL 10uF (16V)	C179
MAIN	C014718-02	CONNECTOR HEADER (22 PIN)	J115
MAIN	C014720-01	CONNECTOR HEADER RT ANGLE (2 PIN)	J105
MAIN	C014795	IC PIA (6520)	A102 (ALTERNATE
			LISTED)
MAIN	C014796	FASTENER .	(JACK PANEL TO
			MAIN)
MAIN	C014812	IC PIA	A102 (ALTERNATE FOR P/N C014795)
MAIN	C015306-01	CONNECTOR HEADER (18 PIN)	J106
MAIN	C015344	RIVET NYLON (SMALL)	
MAIN	C015352	INSULATOR LOWER SHIELD	
MAIN	C015925	INDUCTOR .82uH	L102
MAIN	C016103	SUPPORT BLOCK	
MAIN	CA011840	SPEAKER ASSY (63 OHM)	
MAIN	CA014709	CABLE ASSY	J114
MAIN	CA015965	PC BOARD ASSY (800/UK)	
MODULE	C012763	PRIMARY SHIELD (CASTING)	
MODULE	C012764	LOWER SHIELD	
MODULE	C012955	CARTRIDGE GUIDE	
MODULE	C014001	CLAMP	(MODULE ASSY - SECURES CARTRIDGE
			DOOR ASSY)
MODULE	C014837	GROUNDING CLIP	
MODULE	CA016219	MODULE ASSY	
MODULE	CA016236	CARTRIDGE LOCATOR ASSY	
PWR SUPP	14-5331	RESISTOR 1/4W 330 OHM	R201,202
PWR SUPP	14-5912	RESISTOR 1/4W 9.1K	R204
PWR SUPP	21-101474M	CAP. MYLAR .47UF (100V)	C215
PWR SUPP	31-1N4001	DIODE (1N4001)	CR202-205
			ALTERNATE LISTED)

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PARTS LIST (cont)

Assy	Part No.	Description	Location
PWR SUPP	C010173	SWITCH CHANNEL SELECT	S203 (REPLACEMENT FOR P/N C012242)
PWR SUPP	C010394	CAP. POLY FILM .22uF (100V)	C203.206
PWR SUPP	C012242	SWITCH CHANNEL SELECT	S203 (REPLACEMENT LISTED)
PWR SUPP	C012980-04	KEYTOP (START)	
PWR SUPP	C012980-05	KEYTOP (SELECT)	
PWR SUPP	C012980-06	KEYTOP (OPTION)	
PWR SUPP	C012990	KEYTOP (SYSTEM RESET)	
PWR SUPP	C012995	CONNECTOR RT ANGLE (13 PIN)	J204
PWR SUPP	C014092	HEATSINK	
PWR SUPP	C014179-03	CAP. CERAMIC AXIAL (10pF (50V)	C214
PWR SUPP	C014181-01	CAP. CERAMIC AXIAL . 00luF (25V)	C212,216
PWR SUPP	C014181-03	CAP. CERAMIC AXIAL .luF (25V)	C209
PWR SUPP	C014348	VOLTAGE REGULATOR (5V)	A202
PWR SUPP	C014349	VOLTAGE REGULATOR (12V)	A201
PWR SUPP	C014370	CAP. ELEC AXIAL 470pF (16V)	C201,202
PWR SUPP	C014371	CAP. ELEC AXIAL 10uF (16V)	C210,211
PWR SUPP	C014373	CAP. ELEC AXIAL 2200uF (16V)	C204,205
PWR SUPP	C014374-01	CAP. ELEC RADIAL 4700uF (16V)	C207,208
			(ALTERNATE FOR
	0014074 00		P/N C0143674-02)
PWR SUPP	C0143/4-02	CAP. ELEC RADIAL 4/00uF (16V)	LISTED)
PWR SUPP	C014383	INDUCTOR AXIAL 1uH	L201
PWR SUPP	C014384	INDUCTOR FERRITE BEAD	L202-205
PWR SUPP	C014387	SWITCH INTERLOCK	S201
PWR SUPP	C014388	CONNECTOR SOCKET (DIN)	J205
PWR SUPP	C014397-01	SWITCH POWER	S202 (ALTERNATE
			LISTED)
PWR SUPP	C014397-02	SWITCH POWER	S202 (ALTERNATE FOR
	~~~~~		P/N C014397-01
PWR SUPP	C014398	DIODE RECTIFIER (MR501)	CR206-209
PWR SUPP	C014715	CONNECTOR POWER JACK	J206
PWR SUPP	C014716-01	CONNECTOR SOCKET (22 PIN)	J201
PWR SUPP	C017418-03	HEADER CONNECTOR (5 PIN)	J207
PWR SUPP	C014/21-01	CONNECTOR RT ANGLE (4 PIN)	J202
PWR SUPP	C014//1	RESISTOR 2W 33 OHM	R2U3
PWR SUPP	CU14//6	LED PILOT LAMP (MR501)	CR210,211
PWR SUPP	C014796	FASTENER LATCHING	CD 201
PWR SUPP	C014808-01	DIODE ZENER (IN5231B)	CK201
PWR SUPP	C015344	RIVEI NYLON	
PWR SUPP	C016076	JACK PANEL	

## PARTS LIST (cont)

Assy	Part No.	Description	Location
PWR SUPP	C017988	DIODE (1N4001)	CR202-205 (ALTERNATE FOR P/N 31-1N4001)
PWR SUPP	CA011620-01	SWITCH PUSHBUTTON	S204-207 (ALTERNATE
PWR SUPP	CA01162002	SWITCH PUSHBUTTON	S204-207 (ALTERNATE FOR P/N CA011620-01)
PWR SUPP	CA0014708	HEATSINK ASSY	
PWR SUPP	CA016041	PC BOARD (800/UK PWR SUPP)	
RAM	14-5221	RESISTOR 220 OHM	R 501
RAM	C014179-05	CAP. CERAMIC AXIAL 47pF (50V)	C518
RAM	C014181-01	CAP. CERAMIC AXIAL .001UF (25V)	C521-523
RAM	C014181-02	CAP. CERAMIC AXIAL .01UF (25V)	C503.507.511.515
RAM	C014181-03	CAP. CERAMIC AXIAL .1UF (25V)	C501,502,504-506,
		· · · · · · · · · · · · · · · · · · ·	508-510.512-519
RAM	C014313	IC 74LS244	Z502
RAM	C014331	IC RAM (16K)	Z505-512
RAM	C014339	IC 74LS10	Z501
RAM	C014345	IC 74LS158 .	2503,504
RAM	C014386-02	SOCKET IC (14 PIN)	A 501
RAM	C014386-03	SOCKET IC (16 PIN)	A503-512
RAM	C014386-05	SOCKET IC (20 PIN)	A 502
RAM	C014804	INDUCTOR AXIAL 4.7UH	L501
RAM	CA014802-01	PC BOARD ASSY (16K)	
RAM	CA014802-02	PC BOARD ASSY (8K)	
RF MOD	C014716-04	CONNECTOR SOCKET (5 PIN)	
RF MOD	C016011	UHF MODULATOR	
RF MOD	C016042	PC BOARD	
RF MOD	CA015952-02	RF ADAPTOR PC BOARD	
		ASSY (REV 2)	
ROM	14-51R0	RESISTOR 1 OHM	R404
ROM	14-5222	RESISTOR 2.2K	R402
ROM	14-5471	RESISTOR 470 OHM	R403
ROM	14-54/2	RESISTOR 4.7K	R401
ROM	C012399		A402
ROM	C0141/9-05	CAP. CERAMIC AXIAL 4/pF (50V)	C407,409
ROM	C0141/9-12	CAP. CERAMIC AXIAL $68PF(50V)$	C408,410
ROM	C014181-01	CAP. CERAMIC AXIAL $10010F(25V)$	
ROM	C014181-03	CAP. CERAMIC AXIAL $.10F(25V)$	C401,403,405,406
ROM	C014101-12	CAP. CERAMIC AXIAL JUIUF (208)	C404,41 7/03
ROM	C014341		2403 7/102
ROM	C014344	IC 74I S138	2+02 7/101
ROM	C014380	INDUCTOR 22UH	L 401_403

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## PARTS LIST (cont)

Assy	Part No.	Description	Location
ROM	C014386-02	SOCKET IC (14 PIN)	Z402,403
ROM	C014386-03	SOCKET IC (16 PIN)	Z401
ROM	C014386-07	SOCKET IC (24 PIN)	A401-403
ROM	C015199	IC ROM - OS	A403
ROM	C015299	IC ROM - OS	A401
ROM	CA015961	PC BOARD (10K ROM)	

### PARTS LIST

Assy	Part No.	Description	Location
CPU	14-5102	RESISTOR 1/4W IK	R302-306,313
CPU	14-5103	RESISTOR 1/4W 10K	R314
CPU	14-51R0	RESISTOR 1/4W10HM	R317
CPU	14-5334	RESISTOR 1/4W 330K	R308
CPU	14-5471	RESISTOR 1/4W 470 OHM	R316
CPU	14-5472	RESISTOR 1/4W 4.7K	R301,307,310,311
			312
CPU	14-5682	RESISITOR 1/4W 6.8K	R315
CPU	19-411504	RESISTOR VARIABLE 500K	R309
CPU	34-2N3904	TRANSISTOR 2N3904	Q301
CPU	C010821	CAP. POLY 820pF (50V)	C308
CPU	C014179-01	CAP. CERAMIC AXIAL 22pF (50V)	C309
CPU	C014179-14	CAP. CERAMIC AXIAL 56pF (50V)	C310
CPU	C014313	IC 74LS244	Z302
CPU	C014386-02	SOCKET IC (14 PIN)	Z301,302
CPU	C014386-05	SOCKET IC (20 PIN)	Z303,304
CPU	C014386-09	SOCKET IC (40 PIN)	A301-303
CPU	C014806	IC MPU (6502 Modified)	A303
CPU	C014887	IC ANTIC (PAL)	A302 ·
CPU	C014889	IC GTIA (PAL)	A301
CPU	C016045	IC 74LS74	Z301
CPU	C016074	NEOPRENE PAD	
CPU	C017222	Inductor 1.5uH	L303
CPU	C017536	CRYSTAL 4.433618 Mhz	Y301
CPU	CA015967	PC BOARD ASSY (CPU PAL/UK)	
CPU	C014181-01	CAP. CERAMIC AXIAL .001uF (25V)	C307
CPU	C014181-02	CAP. CERAMIC AXIAL .01uF (25V)	C303,306
CPU	C014181-03	CAP. CERAMIC AXIAL .1uF (25V)	C301,302,304,305
CABLE	78-24001	CABLE TIE	
CABLE	C010389	TORROID CORE	
CABLE	CA014851	CABLE ASSY (PAL)	
CABLE	CA016234	COAXIAL CABLE	
CONSOLE	88-1006	RUBBER FEET	
CONSOLE	C012947	TOP COVER	
CONSOLE	C012970	LATCH	
CONSOLE	C012971	ACTUATOR	
CONSOLE	C012991	LENS	
CONSOLE	C014170	SPRING LATCH	
CONSOLE	CA014115	TOP COVER ASSY	

### PARTS LIST (cont)

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Assy	Part No.	Description	Location
CONSOLE	CA016206-01	CONSOLE ASSY (8K)	
CONSOLE	CA016206-02	CONSOLE ASSY (16K)	
CONSOLE	CA016209-01	LOWER COVER ASSY (16K)	
CONSOLE	C012948	LOWER COVER	
DOOR	C012778	REAR SHIELD	
DOOR	C012779	CARTRIDGE SHIELD	
DOOR	C012939	CARTRIDGE COVER	
DOOR	C012940	REAR COVER	
DOOR	C014093	SPRING	
DOOR	C014843	INNER SHIELD	
DOOR	C014847-01	FOAM STRIP	
DOOR	C014847-02	FOAM STRIP	
DOOR	C015324	PAD	
DOOR	CA014038	DOOR ASSY	
DOOR	CA014848	SHIELD ASSY	
FINAL	CA016205-01	ATARI 800 PAL COMPUTER (16K)	
KEYBOARD	C014710-03	CONNECTOR HOUSING (18 PIN)	
KEYBOARD	C014778-01	CONNECTOR FLAT CABLE (18 PIN)	
KEYBOARD	C015318	RIBBON CABLE	
KEYBOARD	CA012952-01	KEYBOARD ASSY	EARLY VERSION
			(WHITE RIBBON)
KEYBOARD	CA015319	CABLE ASSY	
MAIN	14-5101	RESISTOR 1/4W 100 OHM	R101,105,107,
		·	110-126,168-174,
			184-187
MAIN	14-5102	RESISTOR 1/4W IK	R102,157,160,162,
			165,166,199,202
MAIN	14-5103	RESISTOR 1/4W 10K	R161,198
MAIN	14-5104	RESISTOR 1/4W 100K	R155
MAIN	14-5105	RESISTOR 1/4W1 MEG	R154
MAIN	14-5121	RESISTOR 1/4W 120 OHM	R201
MAIN	14-5182	RESISTOR 1/4W 1.8K	R130-137.190
MAIN	14-5183	RESISTOR 1/4W 18K	R167,181,191,206
MAIN	14-5221	RESISTOR 1/4W 220 OHM	R138-153,175-178,
			200
MAIN	14-5222	RESISTOR 1/4W 2.2K	R163,179
MAIN	14-5271	RESISTOR 1/4W 270 OHM	R106.203
MAIN	14-5272	RESISTOR 1/4W 2.7K	R159
MAIN	14-5332	RESISTOR 1/4W 3.3K	R164.196
MAIN	14-5363	RESISTOR 1/4W 36K	R180
MAIN	14-5392	RESISTOR 1/4W 3.9K	R205

## PARTS LIST (cont)

<u>Assy</u>	Part No.	Description	Location
MAIN	14-5471	RESISTOR 1/4W 470 OHM	R104
MAIN	14-5472	RESISTOR 1/4W 4.7K	R183,192-195,197
MAIN	14-5473	RESISTOR 1/4W 47K	R127,128
MAIN	14-5474	RESISTOR 1/4W 470K	R156
MAIN	14-5681	RESISTOR 1/4W 680 OHM	R103,108,109
MAIN	14-5750	RESISTOR 1/4W 75 OHM	R189,204
MAIN	14-5912	RESISTOR 1/4W 9.1K	R182.188
MAIN	21-101473	CAP. MYLAR .04/UF (100V)	C12/-134
			(ALTERNATED LISTED)
MAIN	31-1N914	DIODE IN914	CR101,102,104-108
MAIN	33-2N3906	TRANSISTOR 2N3906	Q102,103107
MAIN	34-2N3563	TRANSISTOR 2N3563	Q106
MAIN	34-2N3904	TRANSISTOR 2N3904	Q101,104,105
MAIN	C010174	TRANSISTOR ARRAY	A104
MAIN	C010394	CAP. POLY FILM .22uF (100V)	C103,180
Main	C010448	CONNECTOR SOLDER RT ANGLE	J110-113
		(9 Pin)	(ALTERNATED LISTED)
MAIN	C010727	CONNECTOR RT ANGLE (9 PIN)	J110-113
			(ALTERNATE LISTED
			FOR P/N C010448))
MAIN	C010816	HEX CMOS (4050B)	A103
MAIN	C010821	CAP. POLY 820pF (50V)	C169,173
MAIN	C010823	INDUCTOR VARIABLE 0.6-1.2uH	LIOI
MAIN	C012285	CRYSTAL 3.546894 MHZ	X101
MAIN	C012294		AIUI
MAIN	C014179-02	CAP. CERAMIC AXIAL $4/pr(50V)$	
MAIN	C014179-03	CAP. CERAMIC AXIAL TUPF (50V)	
MAIN	C0141/9-04	CAP. CERAMIC AXIAL 33pr (50V)	
MAIN	C014180-03	CAP. CERAMIC AXIAL 100PF (50V)	C164,170
MAIN	C014180-05	CAP. CERAMIC AXIAL 200PF (50V)	C1/4-1/6
MAIN	C014180-09	CAP. CERAMIC AXIAL .04/uF (50V)	CI2/-I34 (ALTERNATE
1 8 A TNT	C01/191_01		FOR P/N 21-1014/3)
MAIN	C014181-01	CAP. CERAMIC AXIAL JUILIF (25V)	C104-121,123,
			133-160,163,177,178
			182-188,194-197,
MATN	C01/181 02		200
WAIN	C014181-02	CAP. CERAMIC AXIAL JUIUF (25V)	(101, 124, 12),
ΝΑΔΙΝΙ	C01/181 02	CAR CERAMIC AVIAL $1.1 \in (25V)$	(170-175)
	C014181-05	CAP. CERAINIC AXIAL .TUP (2))	191 199 199
ΜΔΙΝ	C01/181_05	CAD CEDAMIC AVIAL 220E (2511)	C102 190 (AT TEDNATE
IVIALIN	C014101-0J	CAF. CERAMIC AXIAL .220F (209)	$E \cap P P N \cap (A \cup E \in N \cap A \cup E)$
MAIN	CO14322	CONNECTOR FDCF (22/1/1/1)	1102-104 107
MAIN	C014323	CONNECTOR EDGE (22/44)	1101
			0101

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### PARTS LIST (cont)

Assy	Part No.	Description	Location
MAIN	C014336	IC (CD4051)	Z103,104
MAIN	C014347	IC 74LS243	Z105,106
MAIN	C014361	IC 74LS42	Z101
MAIN	C014362	IC 74LS32	Z102
MAIN	C014371	CAP. ELEC AXIAL 10UF (16V)	C199
MAIN	C014379	RESISTOR (9 x 4.7K)	R129,158
MAIN	C014384	INDUCTOR FERRITT BEAD	L103-112
MAIN	C014386-02	SOCKET IC (14 PIN)	Z105-106,A103-104
MAIN	C014386-03	SOCKET IC (16 PIN)	Z101-104
MAIN	C014386-09	SOCKET IC (40 PIN)	A101,102
MAIN	C014389	CONNECTOR EDGE (15/30)	J108,109
MAIN	C014392	CAP. ELEC RADIAL 10uF (16V)	C179
MAIN	C014718-02	CONNECTOR HEADER (22 PIN)	J115
MAIN	C014720-01	CONNECTOR HEADER RT ANGLE (2 PIN)	J105
MAIN	C014795	IC PIA (6520)	A102 (ALTERNATE LISTED)
MAIN	C014812	IC PIA	A102 (ALTERNATE
MAIN	C015306-01	CONNECTOR HEADER (18 PIN)	T106
MAIN	C015344	RIVET NYLON (SMALL)	5100
MAIN	C015352	INSULATOR LOWER SHIFLD	
MAIN	C015925	INDUCTOR 820H	1.102
MAIN	C016103	SUPPORT BLOCK	2102
MAIN	CA011840	SPEAKER ASSY (63 OHM)	
MAIN	CA014709	CABLE ASSY	3114
MAIN	CA015965	PC BOARD ASSY (800/UK)	
MODULE	C012763	PRIMARY SHIELD (CASTING)	
MODULE	C012764	LOWER SHIELD	
MODULE	C012955	CARTRIDGE GUIDE	
MODULE	C014001	CLAMP	(MODULE ASSY - SECURES CARTRIDGE
			DOOR ASSY)
MODULE	C014837	GROUNDING CLIP	
MODULE	CA016207	MODULE ASSY	
MODULE	CA016236	CARTRIDGE LOCATOR ASSY	
PWR SUPP	14-5331	RESISTOR 1/4W 330 OHM	R201.202
PWR SUPP	14-5912	RESISTOR 1/4W 9.1K	R204
PWR SUPP	21-101474M	CAP. MYLAR .47UF (100V)	C215
PWR SUPP	31-1N4001	DIODE (1N4001)	CR202-205
			ALTERNATE LISTED)
### ATARI 800 COMPUTER CONSOLE PARTS LIST

# PARTS LIST (cont)

Assy	Part No.	Description	Location
PWR SUPP	C010173	SWITCH CHANNEL SELECT	S203 (REPLACEMENT FOR P/N C012242)
PWR SUPP	C010394	CAP. POLY FILM .22uF (100V)	C203.206
PWR SUPP	C012242	SWITCH CHANNEL SELECT	S203 (REPLACEMENT LISTED)
PWR SUPP	C012980-04	KEYTOP (START)	,
PWR SUPP	C012980-05	KEYTOP (SELECT)	
PWR SUPP	C012980-06	KEYTOP (OPTION)	
PWR SUPP	C012990	KEYTOP (SYSTEM RESET)	
PWR SUPP	C012995	CONNECTOR RT ANGLE (13 PIN)	J204
PWR SUPP	C014092	HEATSINK	
PWR SUPP	C014179-03	CAP. CERAMIC AXIAL (10pF (50V)	C214
PWR SUPP	C014181-01	CAP. CERAMIC AXIAL . 00luF (25V)	C212,216
PWR SUPP	C014181-03	CAP. CERAMIC AXIAL .luF (25V)	C209
PWR SUPP	C014348	VOLTAGE REGULATOR (5V)	A202
PWR SUPP	C014349	VOLTAGE REGULATOR (12V)	A201
PWR SUPP	C014370	CAP. ELEC AXIAL 470pF (16V)	C201,202
PWR SUPP	C014371	CAP. ELEC AXIAL 10uF (16V)	C210,211
PWR SUPP	C014373	CAP. ELEC AXIAL 2200uF (16V)	C204,205
PWR SUPP	C014374-01	CAP. ELEC RADIAL 4700uF (16V)	C207,208
			(ALTÉRNATE FOR
			P/N C0143674-02)
PWR SUPP	C014374-02	CAP. ELEC RADIAL 4700uF (16V)	C207,208 (ALTERNATE
			LISTED)
PWR SUPP	C014383	INDUCTOR AXIAL 1uH	L201
PWR SUPP	C014384	INDUCTOR FERRITE BEAD	L202-205
PWR SUPP	C014387	SWITCH INTERLOCK	S201
PWR SUPP	C014388	CONNECTOR SOCKET (DIN)	J205
PWR SUPP	C014397-01	SWITCH POWER	S202 (ALTERNATE
			LISTED)
PWR SUPP	C014397-02	SWITCH POWER	S202 (ALTERNATE FOR
			P/N C014397-01
PWR SUPP	C014398	DIODE RECTIFIER (MR501)	CR206-209
PWR SUPP	C014715	CONNECTOR POWER JACK	J206
PWR SUPP	C014716-01	CONNECTOR SOCKET (22 PIN)	J201
PWR SUPP	C017418-03	HEADER CONNECTOR (5 PIN)	J207
PWR SUPP	C014721-01	CONNECTOR RT ANGLE (4 PIN)	J202
PWR SUPP	C014771	RESISTOR 2W 33 OHM	R203
PWR SUPP	C014776	LED PILOT LAMP (MR501)	CR210,211
PWR SUPP	C014796	FASTENER LATCHING	
PWR SUPP	C014808-01	DIODE ZENER (1N5231B)	CR201
PWR SUPP	C015344	RIVET NYLON	
PWR SUPP	C016076	JACK PANEL	

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### ATARI 800 COMPUTER CONSOLE PARTS LIST

# PARTS LIST (cont)

Assy	Part No.	Description	Location
PWR SUPP	C017988	DIODE (1N4001)	CR202-205 (ALTERNATE FOR P/N 31-1N4001)
PWR SUPP	CA011620-01	SWITCH PUSHBUTTON	S204-207 (ALTERNATE
PWR SUPP	CA011620-02	SWITCH PUSHBUTTON	S204-207 (ALTERNATE FOR P/N CA011620-01)
PWR SUPP	CA014171	PC BOARD ASSY (800/PAL PWR SLIPP)	
PWR SUPP RAM RAM RAM RAM RAM	CA0014708 14-5221 C014179-05 C014181-01 C014181-02 C014181-03	HEATSINK ASSY RESISTOR 220 OHM CAP. CERAMIC AXIAL 47pF (50V) CAP. CERAMIC AXIAL .001UF (25V) CAP. CERAMIC AXIAL .01UF (25V) CAP. CERAMIC AXIAL .1UF (25V)	R 501 C 518 C 521-523 C 503,507,511,515 C 501,502,504-506,
RAM RAM RAM RAM RAM RAM RAM RAM RAM RAM	C014313 C014331 C014339 C014345 C014386-02 C014386-03 C014386-05 C0143804 CA014802-01 CA014802-02 C010470 C010471 C016071	IC 74LS244 IC RAM (16K) IC 74LS10 IC 74LS158 SOCKET IC (14 PIN) SOCKET IC (16 PIN) SOCKET IC (20 PIN) INDUCTOR AXIAL 4.7UH PC BOARD ASSY (16K) PC BOARD ASSY (16K) PC BOARD ASSY (8K) SHIELD COVER RF MODULE	2502 2505-512 2501 2503,504 A501 A503-512 A502 L501
RF MOD RF MOD ROM ROM ROM ROM ROM ROM ROM ROM ROM ROM	CA012174 CA01217504 14-51R0 14-5222 14-5471 14-5472 C012399 C014179-05 C014179-12 C014181-01 C014181-03 C014181-02 C014312 C014341 C014344 C014380	RF MODULE "B" ASSY PC BOARD (RF MODULE) RESISTOR 1 OHM RESISTOR 2.2K RESISTOR 470 OHM RESISTOR 4.7K IC ROM CAP. CERAMIC AXIAL 47pF (50V) CAP. CERAMIC AXIAL 47pF (50V) CAP. CERAMIC AXIAL 68PF (50V) CAP. CERAMIC AXIAL .001uF (25V) CAP. CERAMIC AXIAL .01uF (25V) CAP. CERAMIC AXIAL .01uF (25V) IC 74LS09 IC 74LS138 INDUCTOR 22UH	R404 R402 R403 R401 A402 C407,409 C408,410 C402 C401,403,405,406 C404,411 Z403 Z402 Z401 L401-403

### ATARI 800 COMPUTER CONSOLE PARTS LIST

# PARTS LIST (cont)

Assy	Part No.	Description	Location
ROM	C014386-02	SOCKET IC (14 PIN)	Z402,403
ROM	C014386-07	SOCKET IC (24 PIN)	A401-403
ROM ROM	C015199 C015299 CA015961	IC ROM - OS IC ROM - OS PC BOARD (10K ROM)	A403 A401
ROM	CA015961	PC BOARD (TOK ROM)	

ATARI Home Computer

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#### SECTION 10

#### SERVICE BULLETINS

This section is to be used by you to file the three classification of service bulletins which are periodically released by the Manager of Technical Support.

The following are brief descriptions of each classification:

#### FIELD CHANGE ORDER

A Field Change Order describes hardware or software changes to ATARI Computer products and instructs how to implement these changes.

To indicate your **required** action, a Field Change Order is issued as one of the following two categories:

MANDATORY - This identifies a failure mode which affects reliability and describes a procedure to correct the failure. This procedure must be performed on all units serviced or repaired.

AS FAILS - This identifies a failure mode which affects reliability and describes a procedure to correct the failure mode. This procedure must be performed on all units in for service or repair.

#### UPGRADE BULLETINS

An Upgrade Bulletin describes product inprovements or modifications which the consumer may wish to purchase. These Bulletins allow you to modify the customer's unit to add capabilities which may not have been available when the unit was originally manufactured.

#### TECH TIPS

A Tech Tip is a document of a general nature which transmits routine service or repair information. By communicating methods developed since you attended training classes, Tech Tips aid to continuously improve repair skills and increase knowledge of ATARI Computer Products.

Other times, Tech Tips alert you to units which have been modified and are now standard from ATARI Manufacturing, but are different from many existing units and require different repair techniques.

ATARI Home Computer

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number

MODEL: ATARI 400/800 COMPUTERS

DATE: May 28, 1982

### SUBJECT:

GTIA Chip

#### CHANGE DESCRIPTION:

New units manufactured by Atari contain the Graphic Television Interface Adapt (GTIA) chip on the CPU printed circuit board. The GTIA chip is an enhancement of the Color Television Interface Adapter (CTIA) chip and may be purchased as an upgrade to existing units.

Part Location - CPU printed circuit board location A301.

#### INSTALLATION PROCEDURES:

For troubleshooting, installation, and testing, observe warnings or cautions stated in Atari Home Computer Division 400/800 Home Computer System Field Service Manual. Before a chip or board is added to or removed from the system, power the system down.

Follow disassembly instructions in 400/800 Field Service Manual.

Remove CO12295 from location A301 on CPU printed circuit board.

Install CO14805 in location A301 on CPU printed circuit board.

#### **TESTING PROCEDURES:**

Follow standard Test Procedures using Atari Stand Alone Test (Diagnostic) as outlined in Atari 400/800 Computer System Service Manual.

#### CONSUMER INFORMATION:

The GTIA chip adds three graphics modes accessible with BASIC for a total of eleven different graphics modes in BASIC and 256 different colors.

The GTIA chip is fully compatible with software written to run on existing CTIA units. Software which is written to run on the GTIA chip using its enhanced features is not displayed correctly with CTIA units.



number _

MODEL: ATARI 400/800 COMPUTERS	DATE:
PARTS DISPOSITION:	
Not Applicable	
ENCLOSUBES.	
ENCLOSURES:	
CPU Silk Screen	
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number .

DATE:

### MODEL: ATARI 400/800 COMPUTERS

May 28, 1982

### SUBJECT:

GTIA Chip

#### CHANGE DESCRIPTION:

New units manufactured by Atari contain the Graphic Television Interface Adapt (GTIA) chip on the CPU printed circuit board. The GTIA chip is an enhancement of the Color Television Interface Adapter (CTIA) chip and may be purchased as an upgrade to existing units.

Part Location - CPU printed circuit board location A301.

#### **INSTALLATION PROCEDURES:**

For troubleshooting, installation, and testing, observe warnings or cautions stated in Atari Home Computer Division 400/800 Home Computer System Field Service Manual. Before a chip or board is added to or removed from the system, power the system down.

Follow disassembly instructions in 400/800 Field Service Manual.

Remove CO12295 from location A301 on CPU printed circuit board.

Install CO14805 in location A301 on CPU printed circuit board.

#### **TESTING PROCEDURES:**

Follow standard Test Procedures using Atari Stand Alone Test (Diagnostic) as outlined in Atari 400/800 Computer System Service Manual.

#### CONSUMER INFORMATION:

The GTIA chip adds three graphics modes accessible with BASIC for a total of eleven different graphics modes in BASIC and 256 different colors.

The GTIA chip is fully compatible with software written to run on existing CTIA units. Software which is written to run on the GTIA chip using its enhanced features is not displayed correctly with CTIA units.



number

ODEL: ATARI 400/800 COMPUTERS	DATE:
PARTS DISPOSITION:	
Not Applicable	
ENCLOSURES:	
CPU Silk Screen	





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# Consumer Product Service Manager of Tehnical Support TECH TIP

number ___

MODEL: Atari 400/800 Computers

DATE: May 28, 1982

#### SUBJECT:

Revision B, Operating System ROMS.

#### **DESCRIPTION:**

New Atari 400/800 computers contain Revision B ROMs — a refined version of an Operating System ROM, which has a different checksum from Revision A ROMs. When replacing these components, <u>do not mix revision levels</u>. System will not operate if Revision A is paired with Revision B.

#### Parts:

Old ROMS: C012499A and C014599A

Rev B ROMS: C012499B and C014599B

#### Part Location:

400 Computer System - Motherboard location A103 (CO14599) and A104 (CO12499)

800 Computer System - Personality Board Location A401 (CO14599) and A403 (C012499).

You can recognize the new part in this manner:

Top is imprinted with a copyright symbol followed by 1981 Atari.

### **TROUBLESHOOTING AND MAINTENANCE PROCEDURES:**

For troubleshooting, maintenance and testing, observe warnings and cautions stated in Atari 400/800 Home Computer System Service Manual. Before a component or board is added to or removed from the system, power the system down.

If ROM chips are defective or if printer overprints (hiccups), replace ROM chips.



# Consumer Product Service Manager of Tehnical Support TECH TIP

number _

MODEL:	Atari 400/800 Computers	DATE:
	400 Computer	· · · · · · · · · · · · · · · · · · ·
	Follow 400 computer disassembly instructions i System Service Manual to access motherboard.	in 400/800 Home Computer
	Remove ROM chips located at A103 (CO14599A)	) and A104 (CO12499A).
	Replace CO14599A and CO12499A with A103 (C (CO 12499B).	CO14599B) and A104
	Follow reassembly instructions in 400/800 Home Manual.	e Computer System Service
	800 Computer	
	Follow 800 computer disassembly instructions i System Service Manual Section to access ROM n	in 400/800 Home Computer
	Remove ROM chips located at A401 (CO14599) ROM module.	A) and A403 (C012499A) on
	Replace C014599A and C012499A with A4 (CO12499).	01 (C014599B) and A403
	Follow reassembly instructions in your 400/80 Service Manual under ROM Module Installation.	0 Home Computer System
1		

### **TESTING PROCEDURES:**

Follow standard test procedures using Atari Stand Alone Test (Diagnostic) as outlined in Atari 400/800 Computer System Service Manual.

#### **ENCLOSURE:**

- 1. 400 Motherboard, placement
- 2. 800 Personality Board, placement
- 107







# Consumer Product Service Manager of Tehnical Support TECH TIP

number

### MODEL: Atari 400/800 Computers

DATE: May 28, 1982

3 O .

#### SUBJECT:

Revision B, Operating System ROMS.

#### **DESCRIPTION:**

New Atari 400/800 computers contain Revision B ROMs -- a refined version of an Operating System ROM, which has a different checksum from Revision A ROMs. When replacing these components, <u>do not mix revision levels</u>. System will not operate if Revision A is paired with Revision B.

#### Parts:

Old ROMS: C012499A and C014599A

Rev B ROMS: C012499B and C014599B

#### Part Location:

400 Computer System - Motherboard location A103 (CO14599) and A104 (CO12499)

800 Computer System - Personality Board Location A401 (CO14599) and A403 (CO12499).

You can recognize the new part in this manner:

Top is imprinted with a copyright symbol followed by 1981 Atari.

### **TROUBLESHOOTING AND MAINTENANCE PROCEDURES:**

For troubleshooting, maintenance and testing, observe warnings and cautions stated in Atari 400/800 Home Computer System Service Manual. Before a component or board is added to or removed from the system, power the system down.

If ROM chips are defective or if printer overprints (hiccups), replace ROM chips.



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# Consumer Product Service Manager of Tehnical Support TECH TIP

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MODEL:	Atari 400/800 Computers	DATE:	د 1996ء 1915ء 1917ء 1917ء 1917ء 1917ء 1917ء
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	400 Computer		- 2000 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010 - 2010
	Follow 400 computer disassembly instructions in System Service Manual to access motherboard.	in 400/800 Home Co	omputer
	Remove ROM chips located at A103 (CO14599A)	) and A104 (CO1249	9A).
	Replace CO14599A and CO12499A with A103 (C (CO 12499B).	:014 <b>599B)</b> and A104	s jort or standing galactic standing standing s
	Follow reassembly instructions in 400/800 Home Manual.	e Computer System	Service 🧯
	800 Computer		
	Follow 800 computer disassembly instructions in System Service Manual Section to access ROM m	n 400/800 Home Co nodule.	omputer
	Remove ROM chips located at A401 (CO14599) ROM module.	A) and A403 (C0124	99A) on
	Replace C014599A and C012499A with A4 (C012499).	01 (C014599B) an	d A403
	Follow reassembly instructions in your 400/80 Service Manual under ROM Module Installation.	0 Home Computer	System
	n sa an		م م م
TES	TING PROCEDURES:		متې د پښو پا <del>من</del> ې
Foll in A	low standard test procedures using Atari Stand Alone T Atari 400/800 Computer System Service Manual.	est (Diagnostic) as	outlined
ENC	CLOSURE:		
	1. 400 Motherboard, placement		
	2. 800 Personality Board, placement		and the second
1	•		







Z402

R404 R401

R402

2403





