HOME REPAIR GUIDE

APPLE II PLUS

Use all three installments of this guide to cut down your repair bills.

This final installment of the "Apple II Home Repair Guide" consists of a trouble-tree list with all serious malfunctions that do not cause your computer to alert you with a bad beep. This section also includes malfunctions that are unique and warrant separate discussion.

Keep in mind that malfunctions generally result in multiple symptoms. To use this guide, which is written according to symptoms, you will have to match your system's indications to those in the diagnostic table (see page 119). The key to your success in using this guide may lie in your ability to describe your system's malfunction in more than one way (e.g., is every other line "a solid band" or is it "inverse video."?).

Use the table to cross-check your malfunction with the trouble-tree guide. If you cannot find your malfunction here, chances are that you have a bad memory chip. It is unlikely that your ROM chips (locations F3 to F11) are bad or that the CPU has gone bad.

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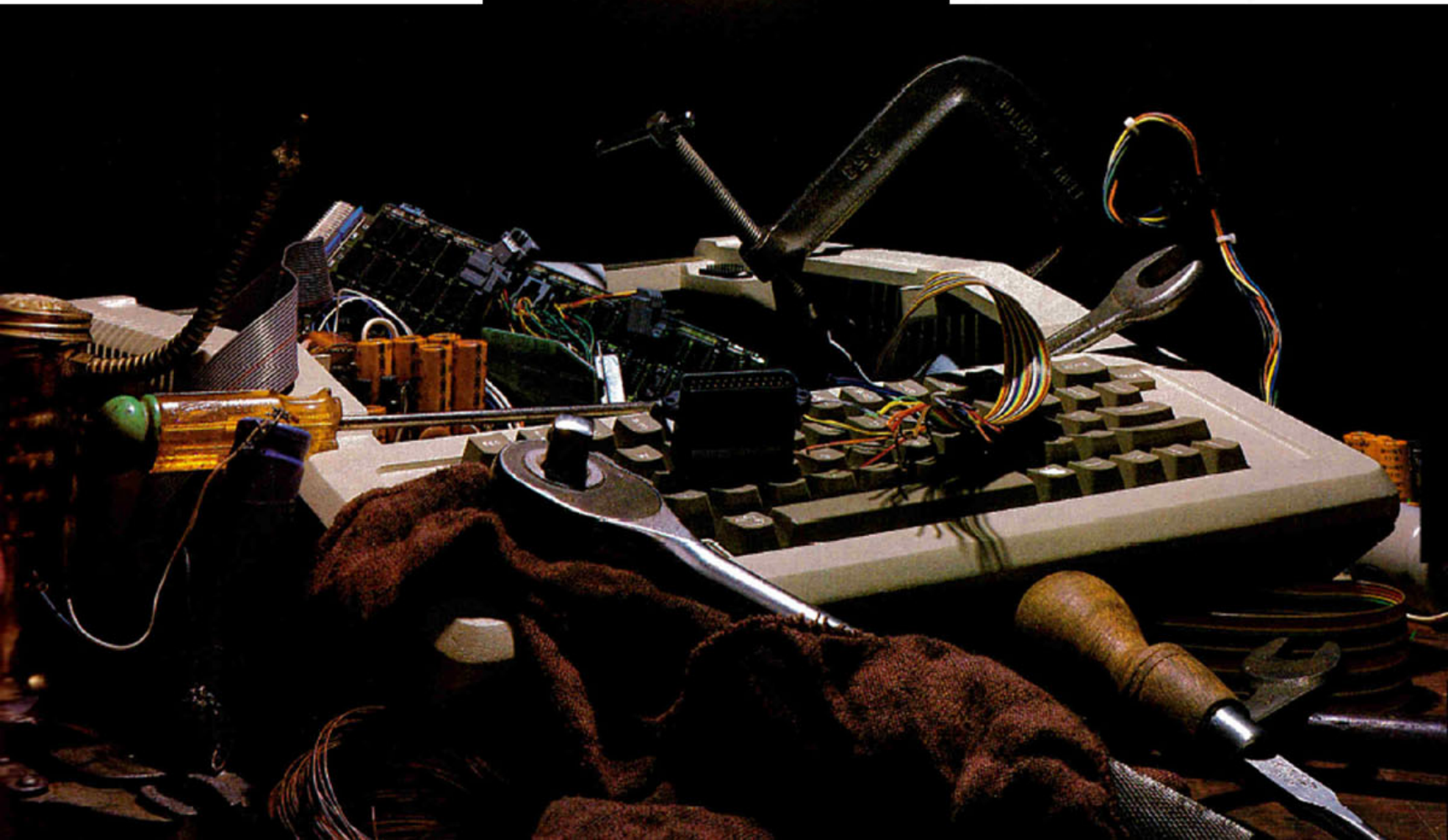

Chip	Location	Malfunction/Indication
K. Bad text, keyboard and Reset lockout, good beep		
ROM-D8	F9/10	Beeps; has Apple II at the top with no cursor present; keyboard and Reset lockout.
L. Bad text, bad GR, bad HGR/2, at least it beeps!		
74LS166	A3	Beeps; flooded or no text screen; "black flashing cursor." Reset causes beep, but you cannot see keyboard input, even though the black cursor moves. Computer doesn't appear to respond to commands because it's always flooded.
ROM SPCL	A5	Revision 7: Beeps; flooded text and a "black cursor" calling GR; text mode causes the display to flash in and out of the Text and Graphics modes. See note below under 2513 character generator.
2513	A5	Revision 0/6: Beeps; "black cursor" and vertical bars. Can call GR and HGR, which appear to be normal. Note: Revision 6 and Revision 7 character generators are not compatible.
74LS151	A9	Revision 0/6 only: Beeps, flooded text, GR, HGR, and HGR2. Accepts keyboard inputs, but flooded out in all modes. Beeps after an erroneous input. Some models can display Apple II name at the top of the screen when reset.
74LS194	A10	Beeps; flooded video in all modes; can't see because of flooded video if it's accepting keyboard inputs.
74LS02	B13	Revision 0/6 only: Beeps; display looks woven, with traversing ripples. Selecting GR removes the vertical bands in the GR video area. HGR is flooded out with noise rippling through it. Once in GR/HGR, you cannot call Text mode back. Reset causes a beep.
74LS11	B12	Beeps; Apple II name at the top and vertical line segments traversing or scrolling horizontally. GR is flooded. HGR will not call, and HGR2 has an array of flashing question marks with flashing vertical bars. Revision 7 models have a vertical row of @ signs up the left side; Revision 0/6 has a vertical row of > signs up the left side.
74LS02	B14	Beeps; top one-third of text is pulled down and slants left or right. GR, HGR, and HGR2 call OK. If you call HGR2 and then GR, the display scrambles and the system locks up.
74LS257	C12	Beeps but has a full array of @ signs. Keyboard lockout, but pressing Reset causes a beep. Revision 0/6 has vertical and alternating double sets of question marks and > signs. Some models have random characters, with every other line flashing.
74LS251	C13	Beeps; no video and no apparent response to keyboard inputs. Reset causes a beep.
74LS161	D11	Beeps; flooded video; apparent keyboard lockout. Reset causes a beep. Revision 0/6 may have lines scrolling diagonally.
74LS161	D12	Beeps; flooded video with vertically scrolling noise up the left center of the screen. Keyboard lockout until Reset; then scrambled video and a beep.
74LS161	D13	Beeps; no video or flooded video with diagonally scrolling lines in text, GR, HGR, and HGR2. Reset causes a beep.
74LS161	D14	Beeps; selecting back and forth from GR/HGR to text may flood or result in blank video with rolling noise or flashing diagonal lines. May also be blank with flipping, rolling, or scrolling noise. Any keyboard input may induce flashing video and speaker static; inconsistent indications.
74LS283	E14	Beeps; flashing array of question marks; three rows contain five A's. Keyboard lockout. Reset causes beep. Revision 0/6 has random array of characters, some flashing. Pressing any key randomly changes characters.
74LS153	E11	Beeps; three sets of four-line bands of flashing question marks on Revision 7 Apples and random letters and numbers on Revision 0/6 models. All models have some segments or blocks of random characters between the three sets of horizontal lines. Keyboard lockout, but Reset moves the random segments or blocks around.
ROM-F0	F5	Beeps; Apple II name at the top with no cursor. May have array of flashing question marks and stray characters. Keyboard lockout until you press Reset. Then you can type, but Return kicks you into the monitor.
ROM-E0	F8	Beeps; may show only Apple II name at the top with no cursor and keyboard lockout or Apple II

Chip	Location	Malfunction/Indication
		name at the top; enters the monitor at address 9102 and displays register status. Repeated attempts to exit from monitor will lock you out.
74LS259	F14	Beeps; no text; system goes straight into the GR mode with horizontal bars in video area and flashing question marks in the lower text area. Keyboard inputs not visible, but the computer will accept valid commands and beep after invalid commands. Reset causes a beep. Revision 0/6 has random characters, some flashing. Generally every other line is flashing. May have vertical columns of A's and @ signs.
74LS08	H1	Beeps; display has an array of @ signs with possible random character-size dark blocks. Reset causes a beep. Revision 0/6 has vertical columns of left brackets and A's.
M. Bad text, bad GR, good beep, good HGR/2		
N. Bad text, bad HGR, good beep, good GR		
74LS257	A8	Beeps; vertical bars in the Text mode. If you press a key, you'll get horizontal bars under vertical ones. You can call GR, and it will look normal, but since the system is stripped, this may be a false indication. HGR/2 has vertical bars. Revision 0/6 shows no problems with this chip removed.
O. Bad text, good beep, good GR/HGR/HGR2		
74LS02	B14	Beeps; top third of text is pulled down and slanted left or right. GR, HGR, and HGR2 call OK if called in that order. If HGR2 is called, then GR, the display will scramble and the system locks up.
555	B3	Beeps; no cursor. Everything else looks and calls OK. Reset causes a beep.
P. Keyboard lockout; may come up in any mode, but can't change		
Q. Bad GR, bad HGR/2, good beep, good text		
74LS194	B4	Beeps; good text. GR has horizontal bars; HGR and HGR2 are flooded. Accepts keyboard inputs. Reset causes a beep.
74LS194	B9	Beeps; good text. GR has horizontal bars; HGR and HGR2 have vertical bars.
R. Bad GR, good beep, good text, good HGR/2		
S. Bad HGR/2, good beep, good text, good GR		
74LS74	A11	Beeps; good video when system is stripped. Has elongated characters when booted with high-resolution-graphics display.
T. Erratic beep		
74LS02	A12	Beeps wildly until reset. Rolling text video. Any keyboard input produces wild beeping. No GR/HGR, or HGR2. Revision 0/6: Return may stop beeping.
74LS257	B7	No beep; screeches with static; rapid Resets may produce an array of flashing question marks with some random characters; keyboard lockout.
74LS74	B10	Wild beeping; pressing the Return key stops it, but any other key restores wild beeping.
74LS02	B13	Intermittent beeping and erratic or scrambled video; repeated Reset causes random changes. May look woven or tweedy with ripple. Keyboard lockout. Reset starts erratic beep. Revision 0/6: Clean single beep. See section L for valid Revision 0/6 conditions.
ROM:D0	F11	Two beeps; flashing array of question marks with random characters; keyboard lockout. Reset puts you into the monitor.
U. Black cursor or no cursor		
74LS166	A3	See diagnostic section L
2513/ROM SPCL	A5	See diagnostic section L
555	B3	See diagnostic section O
ROMk-F0	F5	See diagnostic section L
ROM-D8	F8	See diagnostic section L
ROM-D8	F9	See diagnostic section L
V. Scrolling/rolling video		
74LS11	B12	Beeps; has Apple II name at the top with vertical line segments traversing/scrolling horizontally. GR is flooded, HGR will not call up, HGR2 has an array of question marks with flashing vertical bars. Revision 7 has a vertical row of @ signs up the left side; Revisions 0–6 have > or # up the left side.
74LS04	C11	No beep; rolling array of question marks or color bands; keyboard lockout. See section A.

Chip	Location	Malfunction/Indication
74LS161	D12	Beeps; flooded video with vertically scrolling noise up the left center. Keyboard lockout until reset, then scrambled video; inconsistent characters.
74LS161	D13	Beeps; flooded video with diagonally scrolling lines in all video modes.
74LS138	F13	No beep; horizontal bars/bands. Screen gradually fills in from the top to the bottom with random color blocks and begins to scroll up the screen. See note below for 74LS138 at H12.
74LS138	H12	Same as for chip 74LS138 above. Do not swap these chips.
W. No video/blank screen (as if never turned on)		
These chips are generally in the clock/timing circuits. You cannot get video or have the system operate with bad or no timing signals. Unfortunately, you are in the blind while trying to identify the bad chip. A clock crystal at location A1 rarely goes out. The chips appear in order of failure frequency.		
74LS86	B2	No beep; no video.
74LS00	A2	No beep; no video.
74LS175	B1	No beep; no video.
74LS195	C2	No beep; no video.
74LS251	C13	No beep; no video.
74LS153	C1	No beep; has four distinct video areas. Mentioned here just to acknowledge its distinctiveness and as a clock anomaly.
X. Bad peripheral controls, good beep and video modes		
74LS257	A8	Revision 0/6 only: Beeps; good video in all modes. Possible speaker/text/graphics problems in a fully configured system.
ROM:E8	F6	Beeps; good video but cannot process any math.
74LS138	H2	Beeps; good video, programs OK. Chip is used to control I/O and in booting disk drives.
NE558	H13	Beeps; good video. Chip controls gaming-port timers.
74LS251	H14	Beeps; good video. Chip is for I/O data-bus control.
74LS74	A11	Beeps; good video when system is stripped but has elongated characters when booted with a high-resolution-graphics display.
74LS139	E2	Revision 0/6 only (chip not on Revision 7): beeps; good video in all modes on a stripped-down system. Possible RAM/video problems on a fully configured system.

▶ DIAGNOSTIC TABLE

OBSERVABLE BAD SYMPTOMS	Branch to Probable Fix (Section)*																						
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Beep	●	●	●	●	●	●	●	●	●	●														
Text	●	●	●	●	●						●	●	●	●	●									
Keyboard Inputs**	●					●					●					●								
GR		●	●				●	●				●	●				●	●						
HGR/2		●			●		●			●		●		●			●		●					
Erratic Beep																				●				
Black or No Cursor																					●			
Scrolling Video																						●		
No Video																							●	
Bad Peripheral Control																								●

** A through J were discussed in Diagnostic Trouble Tree, Part I in the July issue of A+, pages 102-103.*

***Keyboard Input includes all the keys and the Reset button. Any response, audio or visual constitutes a "Good Keyboard" for analysis.*