



THINGS TO CHECK WHEN THE AT-BUS EXPANSION KIT “DOESN'T WORK“

Thousands of our AT-Bus Expansion Kits are in use today. On rare occasions there are start-up problems. You should find the following check list helpful to sort out what the cause of the problem is.

First Check These

The first thing to do is to assure that you are not mis-using the Bus Expansion Kit. There are four things to check as follows:

a.) Connections: Cable connections may not be firm. Make sure that the connectors are firmly seated and latched. The model ETRC-AT strain relief bar should be secure and used to prevent any strain on the connectors.

b.) Power: Confirm that you are powering up the expansion chassis simultaneously with the computer chassis. By “simultaneously” we mean within a few milliseconds. The reason for this is that, if the computer has started to boot-up before there is power at the expansion chassis, the computer may not recognize that the expansion chassis is connected. An easy way to assure simultaneous power application is to have the expansion chassis power plug connected to the same power strip as the computer's.

NOTE: The PTRC-AT was designed to allow interrupting power to the expansion chassis, but some cards configure the computer BIOS during power-up.

There have been instances where cheap power supplies in the expansion chassis are so slow to come up that there is no power at the expansion chassis during the early part of the boot-up cycle! In those cases, power should be applied to the expansion chassis **before** power is applied to the computer.

c.) Bus Mastering: Confirm that you are not using any card(s) in the expansion chassis that “bus master”; i.e., take control of the PC bus away from the CPU. Examples are SCSI cards, some DSP cards, etc. Cards that Bus Master **can** be plugged into the computer chassis but not into the expansion chassis.

d.) Board Level Floppy Drives: Some all-in-one motherboards that include floppy drive controllers may conflict with our support for DMA channel 2. If your floppy drive fails when our bus expansion is installed, your system requires Extended-ISA capability and you cannot use models ETRC-AT and LTRC-AT Bus Expansion Kit. Please contact ACCES and we will arrange for you to trade your expansion kit for a model PTRC-AT. If you have a model PTRC-AT, check to assure that the DMA jumper is in the “E-ISA” position as described in the Installation Instructions.

e.) Zero-Wait-State Signal: Confirm that you are not using any card(s) in the expansion

chassis that use the Compressed Write Timing (“zero-wait-state”) signal. (Example: many Super-VGA cards). The Bus Expansion Kit does not service that signal.

The reason that our AT-Bus Expansion Kit does not service that signal is that the AT-Bus specification is that maximum propagation delay on that signal must not exceed 40 nanoseconds. Propagation time through two typical backplanes plus the cables plus a tiny amount through the Bus Expansion Kit circuitry is very close to that limit when four-foot long cables are used. Accordingly, our design decision was to not service that signal. Cards that use that signal **can** be plugged into the computer chassis.

f.) Check that the ET and ER Cards are not installed next to a source of noise

Video cards and single-board computer cards are very noisy! Also, some DC-DC converters, when not shielded, are large sources of radiated noise at their switching frequency.

g.) Check to assure that there is no I/O Bus Address conflict with installed I/O cards

Frequently, when I/O cards are added to an existing system, you don't know what I/O bus addresses are already in use. Thus, you can accidentally install cards with addresses that overlap existing addresses already committed and unpredictable system operation results.

Check your hardware documentation to determine which I/O bus addresses the hardware requires. If you are installing I/O cards from ACCES, we provide software with our plug-in cards that scans your system for available addresses. Check the card's installation disk or contact us for a copy.

h.) Check on the Backplane Termination

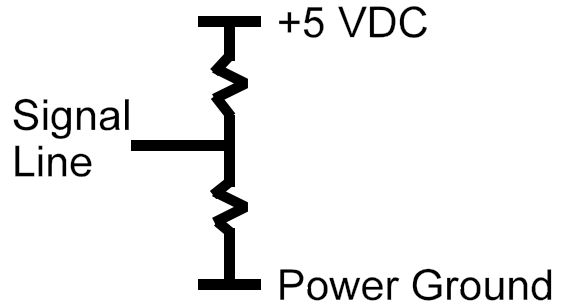
The next thing to suspect is termination of the Bus on the passive backplane in the expansion chassis. When you consider the frequency content of the signals, it's apparent that transmission line techniques must be used. If there is not proper termination either through the cards plugged into that backplane or through termination resistances on the backplane itself, there can be standing waves on that backplane which will interfere with operation.

This is usually not a problem with small 8-, 10-, and 12-slot backplanes but, on larger ones, it can be a source of problems. One quick way to confirm that this is the problem is to try re-locating the receiver card to several different slots. If there are standing waves, chances are good that at least one of the slots will be near or at a null point on the wave and normal operation will occur.

If your backplane has no termination options, you can install our TERMIN card into an empty card slot. The TERMIN card is also a great diagnostic tool to add or check termination on a suspected system.

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If the backplane is not terminated, you can add termination resistances to get a good impedance match that will eliminate the standing wave. For proper impedance match we have found the following circuit works best.



The following connections should be terminated:

62-Pin Connector (XT Connector)				36-Pin Connector (AT Connector)			
"A" Side		"B" Side		"A" Side		"B" Side	
Pin #	Signal	Pin #	Signal	Pin #	Signal	Pin #	Signal
2	SD7	11	SMEMW	1	SBHE	8	DACK0
3	SD6	12	SMEMR	2	LA23	10	DACK5
4	SD5	13	IOW	3	LA22	12	DACK6
5	SD4	14	IOR	4	LA21	14	DACK7
6	SD3	15	DACK3	5	LA20		
7	SD2	17	DACK1	6	LA19		
8	SD1	19	DACK0	7	LA18		
9	SD0	20	CLK	8	LA17		
11	AEN	26	DACK2	9	MEMR		
12	SA19	27	T/C	10	MEMW		
13	SA18	28	BALE	11	SD08		
14	SA17	30	OSC	12	SD09		
15	SA16			13	SD10		
16	SA15			14	SD11		
17	SA14			15	SD12		
18	SA13			16	SD13		
19	SA12			17	SD14		
20	SA11			18	SD15		
21	SA10						
22	SA9						
23	SA8						
24	SA7						
25	SA6						
26	SA5						
27	SA4						
28	SA3						
29	SA2						
30	SA1						
31	SA0						