RUNNING THE AR-32A STAND ALONE

The purpose of this document is to explain how to setup and run the AR-32A system from the CD or a USB drive. This is a stand alone mode outside of the host computers operating system. The following procedure will allow you to operate the complete AR software package on a host machine without installing it under windows, linux or other operating system. It will also allow you to run the package if the host computer has a failed hard drive or no hard drive at all. The AR-32A system requires a host machine with three functioning parts; an X86 processor based motherboard, a CD/DVD drive or USB port plus a parallel interface. All machines manufactured since 1981 (except Apple) have an X86 processor including the latest Intel multicore I7 parts. The parallel interface may be a legacy printer port, a docking station, legacy extender or you may add the port to a modern notebook machine using an ExpressCard (Startech #EC1PECPS) or PCI-Express card for desktops.
NOTE: To use a modern notebook machine it must have an ExpressCard slot. This is sometimes identified with an **EX** or **EP** printed next to the slot opening or door. You can also check the system specs on the internet to see if a host machine is equipped with this interface. **IMPORTANT:** Do not purchase an ExpressCard parallel interface which states in the description ***USES NO SYSTEM RESOURCES. This card will not work!***

STEP 1 - BOOT FROM THE CD
Before you proceed confirm that the host machine will boot from the CD. You ***do not*** need the AR-32A programming unit connected to the machine to perform this test. Insert the distribution CD into the CD/DVD drive on the host machine and reboot. If the machine boots to windows or the primary operating system then the **boot order** must be changed. The boot order determines the order in which possible boot devices (HARD DRIVE, CD/DVD, USB drive, LAN, etc.) will be tested for boot code. If the hard drive is the first in the list order, then lower order devices are not tested unless the hard drive has failed. The boot order is changed using the BIOS SETUP function. The BIOS SETUP is entered before the machine attempts to boot. Usually you will see a brief message stating which key to press on the keyboard to enter setup. If you do not see a message indicating which key to press you may try F2, Esc, DEL or F10. If none of these work then search the internet. Search using "BIOS SETUP" with your machine make and model. Once you have entered the BIOS SETUP locate the BOOT option and change the order to USB, CD/DVD then HARD DRIVE followed by any other options. Once this is done select SAVE and EXIT. The machine will reboot. Confirm that it boots from the CD and then displays a list of **START UP OPTIONS**. When you see the START UP OPTIONS press F8 to pause the boot process.

STEP 2A - CONNECT THE PROGRAMMING UNIT (PRINTER PORT, DOCKING STATION, LEGACY EXTENDER)
If the host computer is equipped with a legacy printer port or is attached to a docking station or legacy extender connect the programming unit to the port mating connector on the machine. Be sure the programming unit is powered on (GREEN LED ON). Press F8 to enable manual booting then press 1. This chooses START EPROM+ SYSTEM (NO CD/DVD DRIVE SUPPORT). You should see the system start, setup the system buffers, present THERE IS NO SYSTEM CONFIGURATION FILE (this is normal) and finally display the DEVICE SELECTION TABLE. At the bottom of this screen you will see ENTER DEVICE TYPE ->. Type 93C56 and press ENTER. You will now see the main COMMAND LIST. You are successfully running from the CD.
IMPORTANT: If you are running on a machine with a legacy printer port and the system does not start or you experience unreliable or inconsistent operation, check the parallel port MODE. This is done through the BIOS SETUP described above. To check enter the BIOS SETUP. Locate the PARALLEL PORT MODE setting. This may be under INTEGRATED PERIPHERALS, ADVANCED SETTINGS or CONFIGURATION. It depends on the machine. The desired modes are ***OUTPUT ONLY, AT, UNIDIRECTIONAL or NORMAL***. If the only settings available are ECP, EPP or BIDIRECTIONAL choose ECP. **DO NOT CHOOSE BIDIRECTIONAL!** Also be sure the port is set to ENABLED not AUTO. Once the changes are complete SAVE and EXIT.

STEP 2B - CONNECT THE PROGRAMMING UNIT (ExpressCard PARALLEL INTERFACE)
Be sure the CD is in the CD/DVD drive then shut down the computer. Insert the PARALLEL INTERFACE ExpressCard into the ExpressCard slot. Be sure it is fully seated. Attach the programming unit connector to the ExpressCard connector. Be sure the programming unit is powered (GREEN LED ON). Power on the computer. The system will boot from the CD and present the STARTUP OPTIONS. Press 1. The system will attempt to locate the programming unit then display WARNING! THE PROGRAMMING UNIT IS NOT RESPONDING TO PORT COMMUNICATION! Below you will see - OPTIONS -. Press S. The software will scan the port addresses of the machine (you will see the scan progress). Once the port to which the programmer is connected is located, the system will briefly display the port address (screen lower right) then present the DEVICE SELECTION TABLE. Type 93C56 and press ENTER. The main COMMAND LIST is displayed. Press a key to clear the configuration information. If the programming unit cannot be located confirm that the ExpressCard is seated properly before the computer was powered on Also confirm that the programming unit is powered on and properly connected to the ExpressCard connector.
IMPORTANT: The S (search) option scans through the I/O port address range of the host machine. During the scan the scan process may overwrite software which was loaded before the scan function was invoked. This causes no physical damage but can prevent a preloaded software driver (STARTUP OPTION 2) from working. To address this issue you must manually enter the port address once the search function completes. When the search function completes watch the lower right corner of the screen and note the port address value. Reboot the machine. When the - OPTIONS - are presented press M (manually enter port address). Type the port address and press ENTER. The software will start normally. This allows you to avoid driver corruption from the S option.
NOTE: This issue is addressed and not a problem if you create a bootable USB drive to start the system.

CREATE A BOOTABLE USB DRIVE (THE BEST STAND ALONE OPTION)

The distribution CD contains its own operating system which allows you to boot the host machine without Windows. Using information and data on the CD you may create a bootable USB drive which works just like the bootable CD. A bootable USB drive allows you to not only use the programmer, but also to save files on the USB drive itself. Thus you can create a single package with the operating system, the progammer software plus whatever files you wish to load or archive.

To create a bootable USB drive perform these steps:

1. Locate a USB drive you wish to make bootable. **Note:** All files will be erased during the procedure.

2. Boot the host machine to Windows (32 or 64 bit can be used). Insert the distribution CD into the CD/DVD drive and insert the USB drive into a USB port on the host machine. Be sure the USB drive is recognized by Windows before proceeding to step 3.

3. Navigate to the CD and open the "extras" folder. You will see a folder called "makeusb". Open this folder and double click the file HOW2DOIT.TXT.

4. Read each step **carefully** and type **exactly** what is required.

5. When the procedure completes use Windows to stop the USB drive and then remove it. The drive is now booable.

BOOTING FROM THE USB DRIVE

Remove the CD from the CD/DVD drive. Turn off the machine then insert the USB drive into a USB port. Power on the computer and confirm that it boots from the USB drive. If the programmer is connected to a printer port, docking station or legacy extender the software will start normally.

THE PROGRAMMER IS CONNECTED TO AN ExpressCard INTERFACE

If the programmer is connected to an ExpressCard interface you will be presented with THE PROGRAMMING UNIT IS NOT RESPONDING TO PORT COMMUNICATION! followed by - OPTIONS -. Press S. The software will search for the programming unit. Once the programming unit is located the port address is briefly shown in the lower right corner of the screen followed by the DEVICE SELECTION TABLE. Type 93C56 and press ENTER. You will see the main COMMAND LIST. Press a key to clear the configuration information.

FOLLOW THESE STEPS EXACTLY:

1. Press 0 (number zero key). Do not exit the program. Now press the O (letter O key). O is for options.

2. The EDIT/SAVE SYSTEM CONFIGURATION FILE option opens at the bottom of the screen. Hold down the ALT key plus U (ALT+U). The existing system configuration settings fill the fields including the PORT adderss (PORT=).

3. Press the TAB key to move the cursor until it is on the DEVICE= field. Now use the BACKSPACE key to erase 93C56.

4. Hold down the ALT key plus S (ALT+S). The configuration file will be saved to the USB drive.

5. Reboot the machine. Confirm that the system starts from the USB drive and presents the DEVICE SELECTION TABLE.

6. You may now use the USB drive to boot this machine. It should boot other machines as long as the same ExpressCard is used.

UNDERSTANDING AND USING THE STARTUP OPTIONS

When you boot from the CD or USB drive the system first displays a list of STARTUP OPTIONS. These options allow you to load drivers which add additional capability to the system once the software starts. You may also exit to a command prompt. The most useful of these options is number two, [2] START EPROM+ SYSTEM WITH WINDOWS (NTFS) DRIVE SUPPORT. This option loads a driver which will allow the system to access the hard drive on most windows computers.

HOW IT WORKS: When you choose option 2 the system loads the NTFS access driver. It then scans the host machine for the fastest drive on which to establish the system buffer. You will see this on the screen. Once the drive on the host machine is tested for speed, you will see drive letters above C. One of these will be the computers hard drive. It **WILL NOT** be drive C. It may be D, E, F or higher. All NTFS drives on the machine, both physical and logical, will be assigned a letter.

HOW TO ACCESS THE COMPUTERS HARD DRIVE USING THE SYSTEM SOFTWARE

To access the computers hard drive use the PATH command. From the COMMAND LIST Press P. If you have booted from the USB drive the CURRENT PATH will be C:\. To scan for drives on the host machine press F5 (SCAN SYSTEM FOR DRIVES). When the scan completes the system will present a list of available drive letters. Press the drive letter you wish to access. The host machine NTFS drive will probably be drive D, E or F. Press the letter. Directories which exist on that drive will appear in the top pane. You may navigate these directories plus set any one as the current path to which the system can save or load files.

HOW BOOTABLE MEDIA ASSIGNS DRIVE LETTERS

If you boot from the CD the CD drive will appear as drive A:. This is because the operating system on the CD (FreeDos) boots the CD as though it is a floppy disk. Due to the capacity of a floppy disk the available directories on drive A is limited. If you wish to access additional directories on the CD choose STARTUP OPTION 3. **NOTE:** Option 3 is not compatible with all SATA drives. Also note that the system will usually setup a RAM drive to use as buffer space. If you boot from the CD this will normally appear as drive C. You can tell by using the PATH COMMAND. If you choose a drive letter which displays NO DIRECTORIES press F2. If you see a file named PEP.BUF this is the system RAM drive. ***Do not attempt to save files to this drive or to the CD!***

If you boot from the USB drive and scan for drives (Path command F5 key) you will see drive letter A. If you choose this drive the system will indicate a drive error as there is no physical drive A. Again simulated drive A is used to boot the system. The USB drive will be drive letter C. The RAM drive will usually be drive D unless you have loaded a driver to access the physical CD.