# A-XMP Operation Guide

System Requirements

- MSI® X370, B350 and A320 series motherboard
- Supported AMD® RYZEN series processor
- Memory module supports XMP

How to enable A-XMP

Power on and press **Delete** key to enter BIOS Setup menu. Here are two methods below to enable A-XMP.
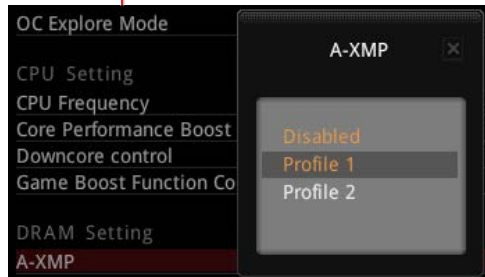
Method 1. BIOS EZ button

Click A-XMP button 1 or 2 to enable XMP profile 1 or profile 2.

Profile 2 Toggle

Profile1 Toggle

A-XMP Indicator
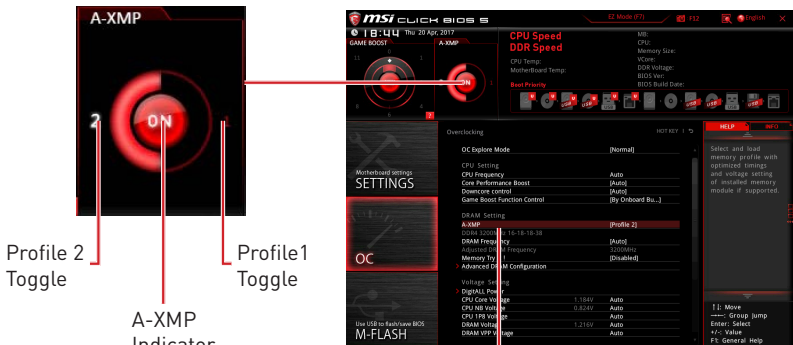
Method 2. BIOS item

Go to **BIOS > OC > A-XMP** and change setting to Profile 1 or Profile 2.

Note

- *Profile 1 is downgrade profile.*
- *Profile 2 is manufacturer verifies profile.*
- *The A-XMP button and item are only avaliable when the system is supported.*

AMD RAID
Configuration Guide

RAID Configuration

Below are the different types of a RAID.

RAID 0   breaks the data into blocks which are written to separate hard drives. Spreading the hard drive I/O load across independent channels greatly improves I/O performance.

RAID 1   provides data redundancy by mirroring data between the hard drives and provides enhanced read performance.

RAID 10 uses four hard drives to create a combination of RAID 0 and 1 by forming a RAID 0 array from two RAID 1 arrays.
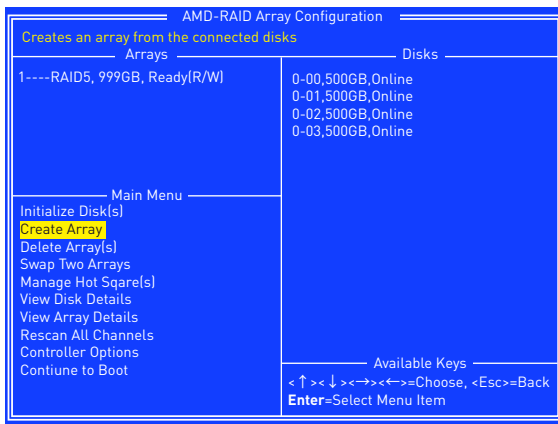
RAID level comparison

	RAID 0	RAID 1	RAID 10
Minimum # drives	2	2	4
Data protection	None	Excellent	Excellent
Read performance	Excellent	OK	OK
Write performance	Excellent	Good	Good
Capacity utilization	100%	50%	50%

⚠️ *Important*

All the information/ volumes/ pictures listed in your system might differ from the illustrations in this appendix.

Using AMD RAID Controller BIOS Configuration Utility

When booting the system, press **Ctrl+R** when the BIOS banner displays. After entering AMD RAID Controller BIOS Configuration Utility, the following screen is displayed.

```
┌──────────────────── AMD-RAID Array Configuration ────────────────────┐
│ Creates an array from the connected disks                            │
│ ┌──────── Arrays ────────┐        ┌──────── Disks ────────┐          │
│ 1----RAID5, 999GB, Ready(R/W)      0-00,500GB,Online                 │
│                                    0-01,500GB,Online                 │
│                                    0-02,500GB,Online                 │
│                                    0-03,500GB,Online                 │
│                                                                      │
│                                                                      │
│ ┌──────── Main Menu ────────┐                                        │
│ Initialize Disk(s)                                                   │
│ Create Array                                                         │
│ Delete Array(s)                                                      │
│ Swap Two Arrays                                                      │
│ Manage Hot Sqare(s)                                                  │
│ View Disk Details                                                    │
│ View Array Details                                                   │
│ Rescan All Channels                                                  │
│ Controller Options          ┌──────── Available Keys ────────┐      │
│ Contiune to Boot            < ↑ >< ↓ ><→><←>=Choose, <Esc>=Back     │
│                             Enter=Select Menu Item                   │
└──────────────────────────────────────────────────────────────────────┘
```

Using the utility to accomplish the procedures

- **Initialize Disk(s)** - To initialize a new disk drive for data storage.
- **Create Array** - Create arrays at different RAID levels (depending on the license level for the system)
- **Delete Array(s)** - Delete an array.
- **Swap Two Arrays** - Change the array order, especially for the AMD-RAID bootable array.
- **Manage Hot Sqare(s)** - Allows selection of global and dedicated hot spares.
- **View Disk Details** - View information about each disk.
- **View Array Details** - View information about each array.
- **Rescan All Channels** - Rescan all channels to detect new or removed disks and arrays.
- **Controller Options** - Change INT13 boot support, turn off Critical arrays or warning for Offline arrays while booting, or change the number of disks that can be spun-up when the system is powered-on.
- **Contiune to Boot** - Exit the BIOS Configuration Utility and continue booting the system.

Understanding the Colour Code

Colour codes indicate the type or status of information at the BIOS Configuration Utility.

- **White text** - Indicates an available option or informational text.
- **Black text, yellow highlighting** - Indicates an option or device for which action might be taken.
- **Yellow text** - Indicates information about the yellow-highlighted option.
- **Green text** - Indicates an item that has been selected.
- **Light blue text** - Indicates that the item cannot be selected.
- **Magenta text** - Indicates items that are related to spares or boot options.
- **Red text** - Indicates a failed virtual or physical disk or a warning. For example, informational text might be red if an option is not available.
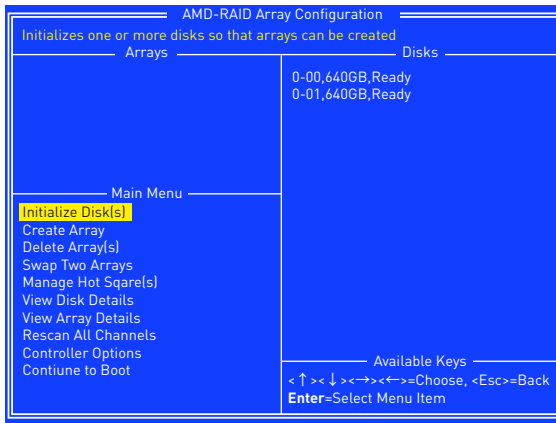
Initialize Disks

New disks and legacy disks must be initialized before they can be used to create an AMD-RAID array. Initialization writes AMD-RAID configuration information (metadata) to a disk.

⚠️ *Important*

- *If a disk is part of an AMD-RAID array, the disk cannot be selected for initialization. To initialize the disk anyway, delete the AMD-RAID array. Data on the disk is deleted during initialization so ensure the correct disks are chosen to initialize.*
- *A legacy disk can contain valid data. When a legacy disk is initialized, all data on the disk is lost.*

To initialize disks

1. At the **Main Menu**, use the **arrow keys** to highlight **Initialize Disk(s).**

```
════════════ AMD-RAID Array Configuration ════════════
 Initializes one or more disks so that arrays can be created
 ─────── Arrays ───────        ─── Disks ───
                               0-00,640GB,Ready
                               0-01,640GB,Ready




      ──── Main Menu ────
  Initialize Disk(s)
  Create Array
  Delete Array(s)
  Swap Two Arrays
  Manage Hot Sqare(s)
  View Disk Details
  View Array Details
  Rescan All Channels
  Controller Options            ─── Available Keys ───
  Contiune to Boot          < ↑ >< ↓ ><→><←>=Choose, <Esc>=Back
                            Enter=Select Menu Item
```

2. Press **Enter** to select Initialize Disk(s).
3. Select the disks to initialize by pressing **Insert** key.
4. Press **Enter** to initialize the selected disks.
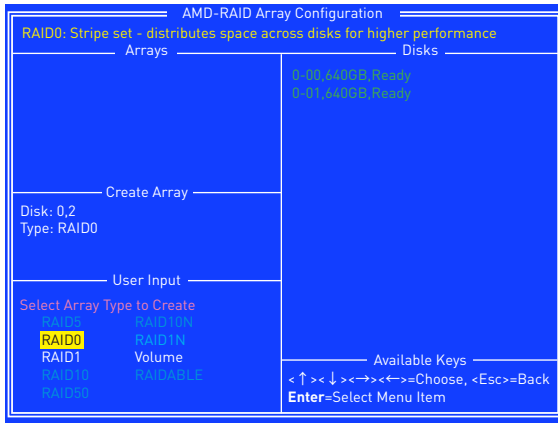5. Press the **C** key to confirm the initialization.

Create Arrays

Arrays can be created after the disks are initialized.

⚠️ *Important*

- *For redundant arrays, the Create process is not finished until after the operating system and AMD-RAID OS drivers have been installed and the system has booted to the operating system. However, the arrays are immediately available to use for either a bootable array or a data array.*
- *If the system is booted from an AMD-RAID bootable array, the first array in the Arrays section must be the bootable array. The system boots only from the first array in the Arrays section. As necessary, use the Swap Two Arrays feature to swap arrays and place the bootable array in the first position.*

To create an array

1. At the **Main Menu**, use the **arrow keys** to highlight **Create Array** and press **Enter**.
2. Select the disks with which to create the array by pressing **Insert** key.

```
================== AMD-RAID Array Configuration ==================
 RAID0: Stripe set - distributes space across disks for higher performance
┌──────────── Arrays ────────────┐ ┌──────────── Disks ─────────────┐
│                                 │ │ 0-00,640GB,Ready               │
│                                 │ │ 0-01,640GB,Ready               │
│                                 │ │                                │
│                                 │ │                                │
│                                 │ │                                │
│──────────── Create Array ───────│ │                                │
│ Disk: 0,2                       │ │                                │
│ Type: RAID0                     │ │                                │
│                                 │ │                                │
│──────────── User Input ─────────│ │                                │
│ Select Array Type to Create     │ │                                │
│   RAID5        RAID10N          │ │                                │
│   RAID0        RAID1N           │ │                                │
│   RAID1        Volume           │ │──────── Available Keys ────────│
│   RAID10       RAIDABLE         │ │ <↑><↓><→><←>=Choose, <Esc>=Back │
│   RAID50                        │ │ Enter=Select Menu Item         │
└─────────────────────────────────┘ └────────────────────────────────┘
```

3. Press **Enter** to include the selected disks in the array.
4. In the User Input section, use the **arrow keys** to select an array type. Only array types that can be created with the selected disks are available.
5. Press **Enter**.
6. Select an array size.
7. Press **Enter** when either the desired size or the maximum available size is reached.
8. Select a caching level using the **arrow keys** and press **Enter**.
9. Press **C** to confirm the array settings.
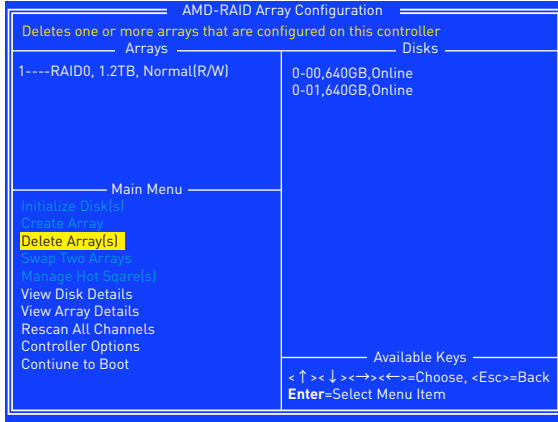
Delete Arrays

⚠️ *Important*

Deleting an array permanently destroys all data that is on the array. This action cannot be undone and it is very unlikely the data can be recovered.

To delete an array

1. At the **Main Menu**, use the **arrow keys** to highlight **Delete Array** and press **Enter**.

```
══════════ AMD-RAID Array Configuration ══════════
 Deletes one or more arrays that are configured on this controller
 ─────── Arrays ───────           ─────── Disks ───────
 1----RAID0, 1.2TB, Normal(R/W)    0-00,640GB,Online
                                   0-01,640GB,Online




 ─────── Main Menu ───────
 Initialize Disk(s)
 Create Array
 Delete Array(s)
 Swap Two Arrays
 Manage Hot Sqare(s)
 View Disk Details
 View Array Details
 Rescan All Channels
 Controller Options               ─────── Available Keys ───────
 Contiune to Boot                 < ↑ >< ↓ >< → >< ← >=Choose, <Esc>=Back
                                  Enter=Select Menu Item
```

2. Select the arrays to delete by pressing **Insert** key.

3. Press **Enter** to delete the selected arrays.

4. Press **C** to confirm the deletion.

Swap Arrays

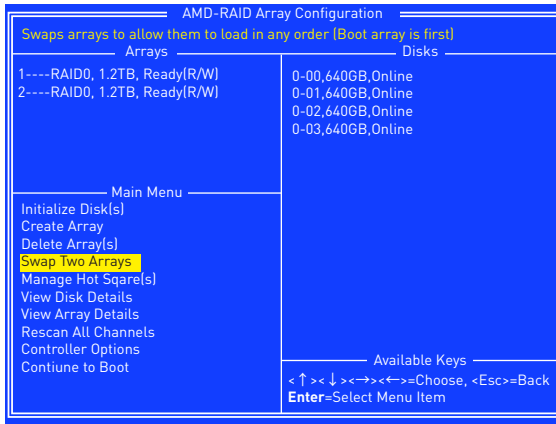Use the Swap Two Arrays option to arrange arrays in a different order.

⚠️ *Important*

If more than one array is created, install the operating system to any of them. However, a small amount of boot information is always written to a disk(s) in the first array (Array 1) of the Array section, regardless on which array the operating system is installed.

If anything happens to a disk in Array 1, the system might not be able to boot. It is recommended that the user install the operating system on an AMD-RAID bootable array at a redundant RAID level such as RAID1 or RAID5 and swap the array into the first position, if it is not already Array 1.

To swap arrays

1. At the **Main Menu**, use the **arrow keys** to highlight "Swap Two Array" and press **Enter**.

```
═════════════ AMD-RAID Array Configuration ═══════════
  Swaps arrays to allow them to load in any order (Boot array is first)
  ══════ Arrays ══════              ══════ Disks ══════
  1----RAID0, 1.2TB, Ready(R/W)     0-00,640GB,Online
  2----RAID0, 1.2TB, Ready(R/W)     0-01,640GB,Online
                                    0-02,640GB,Online
                                    0-03,640GB,Online


  ═════════ Main Menu ═════════
  Initialize Disk(s)
  Create Array
  Delete Array(s)
  Swap Two Arrays
  Manage Hot Sqare(s)
  View Disk Details
  View Array Details
  Rescan All Channels
  Controller Options               ══════ Available Keys ══════
  Contiune to Boot                 < ↑ >< ↓ ><→><←→=Choose, <Esc>=Back
                                   Enter=Select Menu Item
```
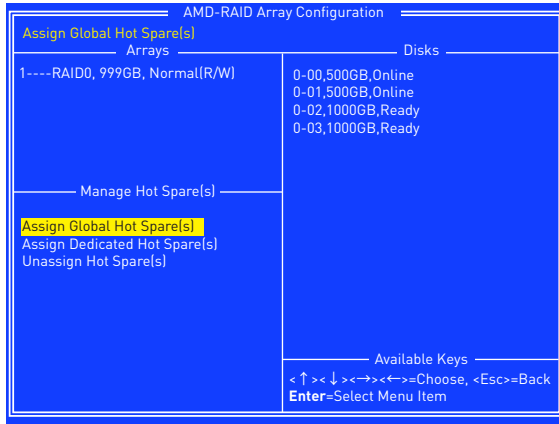
2. Select the arrays to swap by pressing **Insert** key.
3. Press **Enter** to swap the arrays.

Manage Spares

This option allows the user to assign or unassign global or dedicated spares.

At the Main Menu, use the **arrow keys** to highlight **Manage Host Spare(s)** and press **Enter** to enter submenu.

```
================ AMD-RAID Array Configuration ================
 Assign Global Hot Spare(s)
 ─── Arrays ───                          ─── Disks ───
 1----RAID0, 999GB, Normal(R/W)          0-00,500GB,Online
                                         0-01,500GB,Online
                                         0-02,1000GB,Ready
                                         0-03,1000GB,Ready


      ─── Manage Hot Spare(s) ───

  Assign Global Hot Spare(s)
  Assign Dedicated Hot Spare(s)
  Unassign Hot Spare(s)



                                    ─── Available Keys ───
                                 < ↑ >< ↓ ><→><←>=Choose, <Esc>=Back
                                 Enter=Select Menu Item
```

To assign global spares

1. At the Manage Host Spare(s) submenu, use the **arrow keys** to highlight **Assign Global Hot Spare(s)** and press **Enter**.
2. Select the disks to assign as global spares by pressing **Insert** key.
3. Press **Enter** to assign the selected disks as global spares.

To assign dedicated spares

1. At the Manage Host Spare(s) submenu, use the **arrow keys** to highlight **Assign Dedicated Hot Spare(s)** and press **Enter**.
2. Select the disks to assign as dedicated spares by pressing **Insert** key.
3. Press **Enter** to assign dedicated spares.
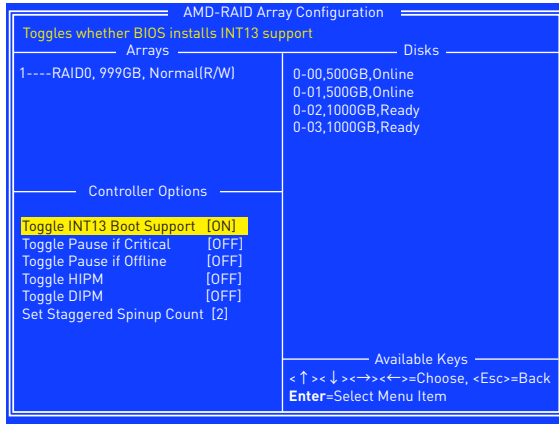4. Press **C** to continue.

To unassign spares

1. At the Manage Host Spare(s) submenu, use the **arrow keys** to highlight **Unassign Hot Spare(s)** and press **Enter**.
2. Select the disks to unassign as spares by pressing **Insert** key.
3. Press **Enter** to unassign the selected disks.
4. Press **C** to continue.

Change the Controller Options

Controller Options allows the user to configure options for the boot sequence.

At the Main Menu, use the **arrow keys** to highlight **Controller Options** and press **Enter** to enter submenu.

```
═══════════ AMD-RAID Array Configuration ═══════════
Toggles whether BIOS installs INT13 support
─── Arrays ───                          ─── Disks ───
1----RAID0, 999GB, Normal(R/W)          0-00,500GB,Online
                                        0-01,500GB,Online
                                        0-02,1000GB,Ready
                                        0-03,1000GB,Ready


        ─── Controller Options ───

Toggle INT13 Boot Support   [ON]
Toggle Pause if Critical      [OFF]
Toggle Pause if Offline       [OFF]
Toggle HIPM                   [OFF]
Toggle DIPM                   [OFF]
Set Staggered Spinup Count  [2]

                                    ─── Available Keys ───
                                < ↑ >< ↓ ><→><←>=Choose, <Esc>=Back
                                Enter=Select Menu Item
```

Booting the system from an array

This option allows the user to enable boot support.

It is recommended that this option be disabled only if the system is booted from another device.

1. At the Controller Options submenu, use the **arrow keys** to highlight **Toggle INT13 Boot Support**.

2. Press **Enter** to toggle between **On** and **Off**.

Pausing the boot sequence for warning messages

When the Pause feature is enabled and an array goes critical, offline, or there is another problem with the system, the boot process stops and an error message is displayed on the screen. The user must press Enter to continue booting.

If the Pause feature is disabled, error messages are displayed briefly, but the system continues to boot.

1. At the Controller Options submenu, use the **arrow keys** to highlight **Toggle Pause if Critical** and press **Enter**.

2. Set pauses to the boot sequence for critical/ offline warnings. Use the **arrow keys** to highlight Toggle Pause if Critical/ Toggle Pause if Offline.

3. Press **Enter** to toggle between **On** and **Off**.

Change the Staggered Spinup Count

Depending on a system's power supply load-rating, you might want to limit the number of disks that are spun-up together when a system is powered on.

1. At the Controller Options submenu, use the **arrow keys** to highlight **Set Staggered Spinup Count** and press **Enter**. The number within the brackets changes colour to indicate it is selected.

2. Use the **arrow keys** to change the number within the brackets. The minimum is 1 and the maximum is 8.

3. Press **Enter** to save the setting.

Using UEFI to create a 2.2TB RAID

If you plan to create a RAID volume greater than 2.2TB, you can only manually create the RAID array in UEFI mode. The steps are described below.
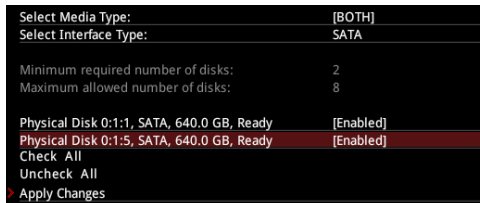
⚠️ **WARNING**

Create raid array will erase all the data stored on hard drives! Make sure to back up your files! There is no way to reverse the process!
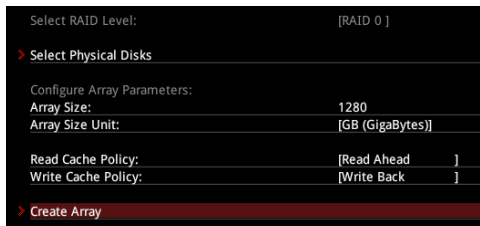
1. Power on and press **Delete** key to enter BIOS Setup menu.

2. Go to **BIOS > SETTINGS > Advanced > Integrated Peripherals > SATA Mode** and change setting to **RAID Mode**.

3. Go to **BIOS > SETTINGS > Advanced > Windows OS Configuration > Windows 10 WHQL Support** and change setting to **Enabled.**

4. Press **F10** to save configuration and exit, and then reboot and press **Delete** key to enter BIOS Setup menu.

5. Go to **BIOS > SETTINGS > Advanced > RAIDXpert2 Configuration Utility > Array Management > Create Array** sub-menu**.**

Select RAID Level:	[RAID 0]
> Select Physical Disks	
Configure Array Parameters:	
Array Size:	0
Array Size Unit:	[]
Read Cache Policy:	[Read Ahead]
Write Cache Policy:	[Write Back]
> Create Array	
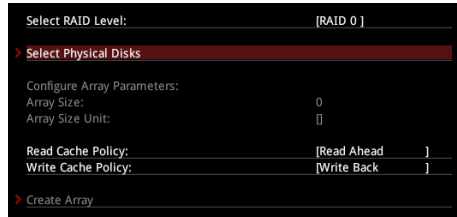
6. Select **RAID Level** for disk arrays.

7. Enter **Select Physical Disks** sub-menu, select member disks by changing the Physical Disk setting to **Enabled**.

Select Media Type:	[BOTH]
Select Interface Type:	SATA
Minimum required number of disks:	2
Maximum allowed number of disks:	8
Physical Disk 0:1:1, SATA, 640.0 GB, Ready	[Enabled]
Physical Disk 0:1:5, SATA, 640.0 GB, Ready	[Enabled]
Check All	
Uncheck All	
> Apply Changes	

8. Select **Apply Changes** to apply and go back to previous sub-menu.

9. Select **Create Array** to create the RAID volume.

Select RAID Level:	[RAID 0]
> Select Physical Disks	
Configure Array Parameters:	
Array Size:	1280
Array Size Unit:	[GB (GigaBytes)]
Read Cache Policy:	[Read Ahead]
Write Cache Policy:	[Write Back]
> Create Array	

Installing RAID Driver

New Operating System Installation

The following details the installation of the drivers while installing operating system.

1. During the operating system installation, after selecting the location to install Windows click on **Load driver** button to install a third party RAID driver.

2. When prompted, insert the USB flash drive with **AMD RAID Drivers** and then click **Browse**.
   - To make an **AMD RAID Drivers** USB flash drive. Insert the MSI Driver Disc into the optical drive. Copy all the contents in \\Chipset\Packages\Drivers\SBDrv\RAID_AM4

3. Navigate to the directory containing the saved AMD RAID drivers, then click **OK**.

4. Select the **(rcbottom.inf)** driver, click **Next**.

5. When prompted, click **OK.**

6. Click **Browse** and navigate to the directory containing the saved AMD RAID drivers again, then click **OK**.

7. Select the **(rcraid.inf)** driver, click **Next**.

8. You have successfully installed the RAID driver, and Windows setup should continue.

9. Leave the disk/ USB drive in the computer until the system reboots itself. Windows setup will need to copy the files after the RAID volume is formatted, and Windows setup starts copying files.

Existing Windows Driver Installation

1. Insert the MSI Driver Disc into the optical drive.

2. The Disc will auto-run and the setup screen will appear.

3. Under the **Driver tab**, click on AMD chipset drivers by your need. The AMD chipset drivers includes RAID Driver.

4. The drivers will be automatically installed.

Confirming Windows Driver Installation

1. From Windows, open the Control Panel from My Computer followed by the System icon.

2. Choose the **Hardware tab**, then click the Device Manager tab.

3. Click the **+** in front of the RAID Controllers hardware type. The driver AMD RAID Controller should appear.