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# Arizona Observatory Hardware Inventory

## Current Equipment Assessment for ASIAir Plan A

### ✅ **KEEP - Compatible with ASIAir**

#### **1. Mount (Requires Upgrade)**

* **Current**: Meade LX75
  + **Issues**: Manual alignment required each session, weight capacity exceeded
  + **Compatibility**: ❌ Cannot achieve unattended operation
  + **Upgrade Required**: ZWO AM5N Harmonic Mount

#### **2. ASIAir Controller**

* **Current**: Latest ASIAir (ASIAir Plus assumed)
  + **Compatibility**: ✅ Perfect - this is the brain of Plan A
  + **Capabilities**: Plan Mode, remote operation, polar alignment automation
  + **Keep**: Yes, perfect for automation goals

#### **3. Focusers**

* **Current**: 2x ZWO EAF Focusers
  + **Compatibility**: ✅ Excellent - native ASIAir integration
  + **Features**: Automated focusing, temperature compensation
  + **Keep**: Yes, ideal for automation

#### **4. Telescopes (OTAs)**

* **4a. Meade 8” ACF SCT**
  + **Weight**: ~8-10 lbs (acceptable for AM5N’s 20kg capacity)
  + **Compatibility**: ✅ Works with ASIAir
  + **Keep**: Yes, excellent for narrow-band deep sky imaging
* **4b. William Optics Zenithstar 81**
  + **Weight**: ~4 lbs (well within limits)
  + **Compatibility**: ✅ Works with ASIAir
  + **Keep**: Yes, perfect for wide-field imaging

#### **5. Cameras**

* **5a. ZWO ASI 533MC (Main Camera)**
  + **Compatibility**: ✅ Native ASIAir support
  + **Current Use**: 8” SCT
  + **Recommendation**: Move to Zenithstar 81 for better field match
  + **Keep**: Yes
* **5b. ZWO ASI 676MC**
  + **Compatibility**: ✅ Native ASIAir support
  + **Current Use**: Zenithstar 81
  + **Recommendation**: Move to 8” SCT for deeper sky objects
  + **Keep**: Yes
* **5c. ZWO ASI462 (Guide Camera)**
  + **Compatibility**: ✅ Native ASIAir support
  + **Current Use**: 50mm guide scope
  + **Keep**: Yes, perfect for guiding
* **5d. Nikon D5300 (Astro Modified DSLR)**
  + **Compatibility**: ✅ Confirmed ASIAir Plus support
  + **Connection**: USB-A to Mini-USB cable required
  + **Workflow**: DSLR mode in ASIAir app
  + **Primary Use**: Wide field constellation and landscape astrophotography
  + **Mounting**: Piggyback on William Optics Zenithstar 81
  + **Benefits**: Large sensor, native color, excellent for wide field work
  + **Keep**: Yes, perfect for Plan A wide field automation

#### **6. Wide Field Lenses (for Nikon D5300)**

* **6a. Rokinon 14mm f/2.8**
  + **Field of View**: Ultra-wide constellation imaging
  + **Use**: Milky Way panoramas, constellation photography
  + **Mount**: Nikon F-mount on D5300
* **6b. Samyang 85mm f/1.4**
  + **Field of View**: Medium wide field deep sky
  + **Use**: Large nebulas, constellation details
  + **Mount**: Nikon F-mount on D5300
* **6c. Samyang 135mm f/2.0**
  + **Field of View**: Telephoto wide field
  + **Use**: Larger deep sky objects, detailed constellation work
  + **Mount**: Nikon F-mount on D5300

#### **7. Filter**

* **Optolong L-Ultimate 2” Dual Bandpass**
  + **Compatibility**: ✅ Works with ASIAir
  + **Note**: Manual filter changes required without filter wheel
  + **Keep**: Yes

### 🔄 **UPGRADE REQUIRED**

#### **1. Mount (Critical for Plan A)**

* **Replace**: Meade LX75 → **ZWO AM5N** (2024 version)
* **Key Differences AM5 vs AM5N**:
  + **AM5N**: Bluetooth + WiFi connectivity, upgraded case, improved tracking
  + **AM5**: Original version, slightly less features
  + **Recommendation**: AM5N for latest features (~$2,500)
* **Benefits**:
  + No manual alignment needed
  + 20kg payload capacity
  + Unattended operation capability
  + Native ASIAir integration

#### **2. Dew Control (Phoenix Climate Consideration)**

* **Current**: “Cheap dew control equipment”
* **Phoenix Analysis**:
  + ❌ **Still needed** - Desert doesn’t mean no dew
  + Winter nights (imaging season) can have significant temperature drops
  + Humidity from irrigation, pools, nearby water features
* **Recommended Upgrade**:
  + ZWO dew heater controller (ASIAir compatible)
  + Proper dew straps for each telescope
  + Camera heater strips
  + **Cost**: ~$200-400 for complete system

### 🆕 **MISSING EQUIPMENT**

#### **1. Filter Wheel (Automation Enhancement)**

* **Current**: Manual filter changes
* **Recommendation**: ZWO EFW (Electronic Filter Wheel)
* **Benefits**: Automated filter sequences, unattended multi-filter imaging
* **Cost**: ~$400-600

#### **2. Guide Scope System**

* **Current**: WO 50mm guide scope
* **Status**: ✅ Adequate for current setup
* **Keep**: Yes, works with ASI462

#### **3. Observatory Structure**

* **Current**: None specified
* **Options**:
  + Dome with automation software
  + Roll-off roof
  + Permanent pier/pillar
* **Location**: TBD (backyard vs roof consideration)

### 🏗️ **OBSERVATORY AUTOMATION SOLUTIONS**

#### **Dome Control Software Options - Good, Better, Best**

##### **🥉 GOOD: NexDome ($5,000-8,000 total)**

* **Dome**: NexDome 2.2m Personal Observatory
* **Cost**: $5,000-6,000 + $1,000-2,000 automation
* **Pros**:
  + Affordable entry point for automated domes
  + 100+ degree shutter opening
  + ASCOM compatible automation available
  + Good community support
* **Cons**:
  + Fit and finish issues reported by users
  + Some assembly complexity
  + Smaller size limits larger telescope setups
* **Best For**: Budget-conscious first observatory, single telescope setup

##### **🥈 BETTER: ACE SmartDome (Observa-Dome) ($6,000-10,000 total)**

* **Dome**: Observa-Dome with ACE automation
* **Cost**: $4,000-6,000 + $1,000-2,000 automation + installation
* **Pros**:
  + Proven reliability in field use
  + ASCOM compliant automation
  + Remote operation capable
  + Good weather integration
  + Multiple size options available
* **Cons**:
  + Mid-range pricing
  + Less premium than top-tier options
  + Installation complexity
* **Best For**: Serious hobbyists wanting reliable automation without premium cost

##### **🥇 BEST: ScopeDome ($8,000-15,000 total)**

* **Dome**: ScopeDome 3m Professional Observatory
* **Cost**: $7,000-12,000 + $1,500-3,000 automation + installation
* **Pros**:
  + Professional-grade construction and materials
  + Advanced automation with weather integration
  + Extremely reliable ASCOM drivers
  + Scheduled automatic open/close
  + Supports multiple dome manufacturers
  + Excellent customer support
  + Future-proof design
* **Cons**:
  + Highest cost option
  + May be overkill for casual use
* **Best For**: Serious automation, remote operation, professional-level reliability

#### **Observatory Design Considerations**

* **Pillar vs Tripod**: Pillar eliminates vibrations, better for roof mounting
* **Roof vs Yard**: Yard preferred for vibration isolation
* **Size**: 8-10 foot dome for dual telescope setup
* **Phoenix Climate**: Monsoon season protection critical (July-September)

### 📸 **CAMERA UPGRADE OPTIONS - BEYOND ASI533MM**

#### **Deep Sky Cameras - Good, Better, Best**

##### **🥉 GOOD: ASI533MM Pro ($600-800)**

* **Current Recommendation**: Still excellent value
* **Sensor**: Sony IMX533 (APS-C, 9MP)
* **Best For**: Zenithstar 81, general deep sky work
* **Pros**: Proven performer, good QE, reasonable price
* **Cons**: Smaller sensor, lower resolution than newer options

##### **🥈 BETTER: ASI294MM Pro ($1,400-1,600)**

* **Sensor**: Sony IMX294 (Four Thirds, 11.7MP)
* **Key Features**: Excellent low noise, perfect for narrowband
* **Best For**: 8” SCT, narrowband imaging, general deep sky
* **Pros**: Outstanding image quality, lower read noise, proven reliability
* **Cons**: Four Thirds sensor smaller than full-frame options
* **Pixel Scale**: Perfect match for 8” SCT at f/6.3-f/10

##### **🥇 BEST: ASI2600MM Pro ($1,900-2,200)**

* **Sensor**: Sony IMX571 (APS-C, 26MP)
* **Key Features**: 16-bit ADC, exceptional dynamic range
* **Best For**: High-resolution imaging, large telescopes, ultimate image quality
* **Pros**: Highest resolution, excellent noise performance, future-proof
* **Cons**: Most expensive, may be overkill for some setups
* **Note**: Available in DUO version with built-in guide camera (+$400)

#### **Color Camera Options**

##### **ASI533MC Pro ($600-800)**

* **Keep**: Perfect for Zenithstar 81 wide field color work
* **Pairs well with**: Mono camera for ultimate flexibility

##### **ASI2600MC Pro ($1,700-1,900)**

* **Upgrade Option**: Same sensor as 2600MM but one-shot color
* **Best For**: High-resolution color imaging, less filter wheel complexity
* **Trade-off**: Less flexible than mono + filters but simpler workflow

#### **Planetary Camera - Keep Current Setup**

##### **Current: ASI462MC (Color) - KEEP**

* **Status**: Excellent for guiding AND planetary imaging
* **Use**: Perfect for your Televue 2.5x barlow + 8” SCT planetary work
* **Benefits**: Color planetary imaging, good frame rates, proven performance
* **Decision**: No upgrade needed - simplicity over marginal gains

#### **Recommended Camera Strategy - Dual-Band Color Approach**

##### **Primary Setup (RECOMMENDED)**

* **Keep**: ASI533MC, ASI676MC, ASI462MC (all color cameras)
* **Upgrade**: ASI2600MC Pro for ultimate color imaging ($1,800)
* **Filter**: Continue with Optolong L-Ultimate dual-band
* **Result**: Simplified workflow, pseudo-Hubble palette capability
* **Benefits**: No filter wheels, no complex processing, excellent results

##### **Alternative: Future Monochrome Path**

* **See**: [Monochrome Options Document](ARIZONA_OBSERVATORY_MONOCHROME_OPTIONS.md)
* **Investment**: $2,600-3,750 for true Hubble Palette
* **Complexity**: Significantly higher
* **Recommendation**: Start with dual-band approach first

##### **Your Televue 2.5x Barlow + Planetary Work**

* **Perfect Setup**: ASI462MC/MM on 8” SCT with barlow
* **Lucky Imaging**: Capture thousands of frames, stack best percentage
* **Manual Focus**: Yes, but live view makes it manageable
* **Targets**: Jupiter bands, Saturn rings, Mars surface features, lunar detail

## 🛒 **COMPLETE SHOPPING LIST WITH MOUNTING SOLUTIONS**

### **📦 Category 1: Essential Mount Upgrade ($2,600-2,800)**

#### **1.1 Mount System**

* **ZWO AM5N Harmonic Mount Head (2024 Version)**: $2,499
  + [High Point Scientific](https://www.highpointscientific.com/zwo-am5n-harmonic-drive-equatorial-mount): $2,499
  + [Agena Astro](https://agenaastro.com/zwo-am5n-strain-wave-drive-equatorial-mount-and-tripod-new-am5.html): $2,499 (with tripod)
  + [B&H Photo](https://www.bhphotovideo.com/c/product/1824019-REG/zwo_zwo_airplus_256g_air_plus_256gb.html): Check current pricing
  + **Critical**: Required for ASIAir automation and Plan Mode operation

#### **1.2 Multi-Telescope Mounting Accessories**

* **Vixen-Style Dovetail Plates** (for dual telescope + piggyback DSLR setup):
  + **8” SCT Dovetail**: Celestron CGE Dovetail Bar (14”) - $89
    - [Amazon](https://amazon.com): Search “Celestron CGE dovetail bar 14 inch”
    - [High Point Scientific](https://highpointscientific.com): Celestron accessories
    - Supports 8” SCT telescope on main mount
  + **Zenithstar 81 Dovetail**: Vixen-style 8” plate - $45-65
    - [William Optics](https://williamoptics.com): Native WO accessories
    - [B&H Photo](https://bhphotovideo.com): Vixen dovetail plates
    - Supports WO telescope + piggyback Nikon D5300
* **Dual Mounting Solutions** (Choose One):
  + **Option A**: ADM V-Series Dual Dovetail Platform - $299
    - [ADM Accessories](https://www.admaccessories.com): V-series dual platform
    - Precision machined, lighter weight solution
  + **Option B**: Losmandy D-Series Dual Saddle - $350
    - [Losmandy](https://www.losmandy.com): D-series mounting solutions
    - Heavy-duty, traditional design for maximum stability

### **📦 Category 2: Nikon D5300 Wide Field Setup ($200-300)**

#### **2.1 Piggyback Mounting System**

* **Piggyback Camera Mount for Zenithstar 81**: $89-120
  + [William Optics](https://williamoptics.com): WO-specific piggyback adapter
  + [Losmandy](https://losmandy.com): Universal piggyback mount
  + [ADM Accessories](https://admaccessories.com): High-quality camera mounting solutions
* **Camera Mounting Hardware**: $25-45
  + **1/4”-20 to 3/8”-16 Adapter**: Universal camera mounting
  + **Quick Release Plate**: For easy camera removal
  + **Ball Head Mount** (optional): For precise framing adjustments

#### **2.2 Power and Control**

* **USB-A to Mini-USB Cable (15-20ft)**: $20-30
  + [Amazon](https://amazon.com): Extra length for piggyback mounting
  + Ferrite core cables for interference reduction
* **Nikon D5300 AC Power Adapter**: $45-65
  + [B&H Photo](https://bhphotovideo.com): Nikon EH-5b + EP-5A power kit
  + **Essential**: Required for long imaging sessions with ASIAir control
* **USB Extension with Power**: $35-50
  + [Amazon](https://amazon.com): Active USB extension cable
  + Maintains signal integrity over longer distances

#### **2.3 Wide Field Lens Support**

* **Lens Dew Shields** (3x for each lens): $60-90 ($20-30 each)
  + [Astrozap](https://astrozap.com): Custom dew shields for specific lenses
  + [Amazon](https://amazon.com): Generic adjustable dew shields
* **Lens Heater Strips** (3x for each lens): $45-75 ($15-25 each)
  + [Kendrick Astro](https://kendrickastro.com): Lens heater strips
  + [Dew-Not](https://dew-not.com): Custom sizing for wide angle lenses

### **📦 Category 3: Dew Control Upgrade ($180-320)**

#### **3.1 ASIAir-Compatible Dew Controller**

* **ZWO Dew Heater Controller**: $89-120
  + [ZWO USA](https://us.zwoastro.com): Official ZWO dew heaters
  + [High Point Scientific](https://highpointscientific.com): ZWO accessories

#### **3.2 Dew Heater Straps**

* **8” SCT Dew Strap**: $35-45
  + [Kendrick Astro](https://kendrickastro.com): 8-inch SCT dew straps
  + [Dew-Not](https://dew-not.com): Custom sizing available
* **Zenithstar 81 Dew Strap**: $25-35
  + [Kendrick Astro](https://kendrickastro.com): 3-4 inch diameter straps
  + [Astrozap](https://astrozap.com): WO-specific dew shields
* **Camera Heater Strips** (3x for all cameras): $60-90 ($20-30 each)
  + [Kendrick Astro](https://kendrickastro.com): Camera heater strips
  + [Amazon](https://amazon.com): Generic camera dew heaters
* **50mm Guide Scope Dew Strap**: $20-30
  + [Kendrick Astro](https://kendrickastro.com): Small diameter straps

### **📦 Category 4: Cable Management & USB Hub ($80-150)**

#### **4.1 USB Hub Requirements**

* **Powered USB 3.0 Hub (7-10 ports)**: $45-75
  + [Amazon](https://amazon.com): ATOLLA or Anker powered USB hubs
  + Must include 12V power supply for astrophotography applications

#### **4.2 Cable Organization**

* **Spiral Cable Wrap (1/2” diameter, 25ft)**: $15-25
  + [Amazon](https://amazon.com): Black spiral cable wrap
  + [McMaster-Carr](https://mcmaster.com): Professional cable management
* **Cable Clips and Mounting Hardware**: $20-50
  + [Amazon](https://amazon.com): Adhesive cable clips and mounts
  + For attaching cables to telescope tubes and mount

### **📦 Category 5: Filter Wheel Automation ($450-650)**

#### **5.1 Electronic Filter Wheel**

* **ZWO EFW 2” Filter Wheel (8-position)**: $449-499
  + [High Point Scientific](https://highpointscientific.com): ZWO EFW 8-position
  + [B&H Photo](https://bhphotovideo.com): ZWO filter wheels
  + [Agena Astro](https://agenaastro.com): ZWO accessories

#### **5.2 Additional Filters (Optional)**

* **Optolong Filter Set** (LRGB or narrowband): $150-300
  + [Optolong](https://optolong.eu): Direct from manufacturer
  + [High Point Scientific](https://highpointscientific.com): Optolong filters

### **📦 Category 6: Power Solutions ($150-400)**

#### **6.1 Main Power Supply**

* **12V 20A Power Supply** (for mount + accessories): $89-150
  + [Amazon](https://amazon.com): Mean Well or similar switching power supplies
  + [B&H Photo](https://bhphotovideo.com): Astrophotography power supplies

#### **6.2 Power Distribution**

* **12V Power Distribution Box**: $60-120
  + [Pegasus Astro](https://pegasusastro.com): PowerBox series
  + [Rigel Systems](https://rigelsys.com): Power distribution accessories

#### **6.3 Battery Backup (Optional)**

* **LiFePO4 Battery Pack (12V 50Ah)**: $200-400
  + [Amazon](https://amazon.com): LiFePO4 battery packs
  + [BattleBorn Batteries](https://battleborn.com): Premium lithium options

### **📦 Category 7: Observatory Networking Solutions ($200-800)**

#### **7.1 Option A: Professional WiFi Extension (RECOMMENDED)**

* **Ubiquiti UniFi Dream Machine**: $300-400
  + [Amazon](https://amazon.com): UDM or UDM-Pro
  + [Ubiquiti Store](https://store.ui.com): Direct from manufacturer
  + Professional-grade router with advanced features
* **Ubiquiti UniFi Access Point WiFi 6**: $150-200
  + [Amazon](https://amazon.com): U6-Lite or U6-Pro
  + Mount in observatory for strong local signal
  + Seamless roaming with main house network
* **PoE Injector** (for access point): $25-40
  + [Amazon](https://amazon.com): 802.3af PoE injector
  + Powers access point over ethernet cable

**Total WiFi Solution**: $475-640

#### **7.2 Option B: Ethernet Backbone (ALTERNATIVE)**

* **Outdoor CAT6 Ethernet Cable** (100-300ft): $50-150
  + [Amazon](https://amazon.com): Direct burial rated CAT6
  + [Monoprice](https://monoprice.com): Professional outdoor ethernet
* **Ethernet Cable Burial/Conduit**: $100-200
  + Professional trenching and conduit installation
  + Protects cable from damage, meets code requirements
* **Observatory Network Switch**: $50-100
  + [Amazon](https://amazon.com): 8-port Gigabit switch
  + Local network hub in observatory

**Total Ethernet Solution**: $200-450

#### **7.3 Networking Strategy Recommendation**

**Best Approach**: Run CAT6 backbone to observatory + local WiFi 1. **Ethernet Backbone**: Reliable, high-speed connection to house 2. **Observatory WiFi**: Local access point for tablets/phones 3. **Redundancy**: Both wired and wireless connectivity 4. **Future-Proof**: Supports 4K streaming, remote desktop, large file transfers

### **📦 Category 8: Observatory Dome Options**

#### **🥉 GOOD: NexDome System ($5,000-8,000)**

* **NexDome 2.2m Observatory**: $5,000-6,000
  + [NexDome](https://nexdome.com): Direct from manufacturer
  + Basic automation included
* **Additional Automation**: $1,000-2,000
  + Enhanced ASCOM drivers and weather integration
* **Total Investment**: $6,000-8,000

#### **🥈 BETTER: ACE SmartDome System ($6,000-10,000)**

* **Observa-Dome Structure**: $4,000-6,000
  + Multiple suppliers available
  + Various size options
* **ACE SmartDome Controller**: $1,000-2,000
  + [ACE Controllers](https://acecontrollers.com): ASCOM automation
  + Weather integration capabilities
* **Installation & Setup**: $1,000-2,000
* **Total Investment**: $6,000-10,000

#### **🥇 BEST: ScopeDome Professional System ($8,000-15,000)**

* **ScopeDome 3m Observatory**: $7,000-12,000
  + [ScopeDome](https://scopedome.com): Direct from manufacturer
  + Premium construction, automation-ready design
* **ScopeDome USB Automation**: $1,500-3,000
  + [ScopeDome Controls](https://scopedome.com): Professional automation controllers
  + Full ASCOM compatibility, weather integration, scheduling
* **Professional Installation**: $2,000-4,000 (optional but recommended)
* **Total Investment**: $8,500-15,000

### **🎯 PRIORITY SHOPPING ORDER**

#### **Phase 1: Essential Automation (Total: $2,800-3,500)**

1. ZWO AM5N Mount + mounting accessories
2. Nikon D5300 integration hardware
3. Improved dew control system
4. USB hub and cable management

#### **Phase 2: Enhanced Automation (Total: $450-650)**

1. Filter wheel for automated sequences
2. Additional filters for specialized imaging

#### **Phase 3: Observatory Structure (Total: $8,000-15,000)**

1. Dome procurement and installation
2. Automation system integration
3. Power and safety systems

### 💡 **MOUNTING SOLUTION RECOMMENDATIONS**

#### **For AM5N Dual Telescope Setup**

1. **Primary Recommendation**: ADM V-Series Dual Platform
   * Clean design, excellent build quality
   * Accommodates both SCT and refractor mounting
   * Easy balance adjustment
2. **Budget Alternative**: Custom dual Vixen rail setup
   * Two separate dovetail saddles on extended platform
   * Less expensive but requires more setup time

#### **Nikon D5300 Wide-Field Configuration**

1. **Piggyback Mounting on Zenithstar 81**: Primary configuration for wide field astrophotography
   * **Lens Options**: Rokinon 14mm f/2.8, Samyang 85mm f/1.4, Samyang 135mm f/2.0
   * **Use Case**: Constellation shots, wide nebula fields, Milky Way panoramas
   * **ASIAir Control**: Full integration with Plan Mode automation
2. **Mount Configuration**: D5300 piggybacks on William Optics Zenithstar 81
   * Zenithstar handles main deep-sky imaging with ASI cameras
   * D5300 captures wide-field views simultaneously or in sequence
   * Both controlled by single ASIAir Plus for unified automation

#### **Complete Observatory Configuration Summary**

* **ZWO AM5N Mount**: Dual telescope platform with piggyback DSLR
* **Primary Telescope**: William Optics Zenithstar 81 + ASI camera system
* **Secondary Telescope**: 8” SCT for planetary and lunar work
* **Wide-Field System**: Nikon D5300 + lens collection piggyback on Zenithstar
* **All Systems**: Controlled by ASIAir Plus for unattended operation

#### **Cable Routing Strategy**

* Route all USB cables through spiral wrap to ASIAir
* Power distribution box near mount base
* Dew heater cables separate from data cables
* Leave service loops for maintenance access

### 💰 **SIMPLIFIED BUDGET TABLES - DUAL-BAND APPROACH**

#### **Phase 1: Essential Automation & ASI2600MC**

| Equipment Type | Item | Vendor | Price |
| --- | --- | --- | --- |
| **Mount** | [ZWO AM5N Mount](https://highpointscientific.com) | High Point Scientific | $2,499 |
| **Mount Accessories** | [Dual Telescope Platform](https://admaccessories.com) | ADM Accessories | $299 |
| **Camera Upgrade** | [ASI2600MC Pro](https://highpointscientific.com) | High Point Scientific | $1,800 |
| **Dew Control** | [ZWO Dew Controller + Straps](https://us.zwoastro.com) | ZWO USA | $250 |
| **D5300 Integration** | [Piggyback Mount + Cables](https://williamoptics.com) | William Optics | $200 |
| **Networking** | [Ethernet + WiFi Setup](https://store.ui.com) | Ubiquiti | $400 |
| **Cable Management** | [USB Hub + Organization](https://amazon.com) | Amazon | $100 |
| **TOTAL PHASE 1** | **Essential Setup** |  | **$5,548** |

#### **Phase 2: Observatory Structure (ACE SmartDome - BETTER)**

| Equipment Type | Item | Vendor | Price |
| --- | --- | --- | --- |
| **Dome Structure** | [Observa-Dome 8ft](https://observa-dome.com) | Observa-Dome | $5,000 |
| **Automation** | [ACE SmartDome Controller](https://acecontrollers.com) | ACE Controllers | $1,500 |
| **Installation** | Professional Setup | Local Contractor | $1,500 |
| **Power Solutions** | [12V System + Distribution](https://pegasusastro.com) | Pegasus Astro | $300 |
| **TOTAL PHASE 2** | **Observatory Structure** |  | **$8,300** |

#### **Phase 3: Optional Enhancements**

| Equipment Type | Item | Vendor | Price |
| --- | --- | --- | --- |
| **Filter Wheel** | [ZWO EFW 8-Position](https://highpointscientific.com) | High Point Scientific | $450 |
| **Additional Filters** | [LRGB Filter Set](https://optolong.eu) | Optolong | $300 |
| **Weather Station** | [Davis Vantage Vue](https://davisinstruments.com) | Davis Instruments | $300 |
| **UPS Backup** | [LiFePO4 Battery System](https://battleborn.com) | BattleBorn | $400 |
| **TOTAL PHASE 3** | **Enhancements** |  | **$1,450** |

### **GRAND TOTAL: $15,298**

*This represents a complete, professional-grade automated observatory with dual-band color imaging capability.*

### 📍 **Phoenix-Specific Considerations**

* **Dew Control**: Still essential despite desert climate
* **Heat Management**: Summer shutdown periods likely needed
* **Light Pollution**: Consider filter strategies for city locations
* **Weather**: Excellent winter imaging conditions
* **Monsoon Season**: Observatory protection critical (July-September)

### 🎯 **IMMEDIATE NEXT STEPS**

1. **Equipment Priority**: ZWO AM5N mount (enables all automation)
2. **Location Survey**: Identify optimal observatory placement
3. **Dome Research**: Get quotes for automated dome systems
4. **Dew Control**: Upgrade to proper ASIAir-compatible system
5. **Budget Planning**: Phase implementation based on timeline