

AI-03750 AMARS Bill of Materials

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I'm preparing for a mobile and base AMARS radio station deployment . Create a comprehensive shopping list for a mobile setup and base. Include estimated price. For the base setup, an antenna for balcony only and for mobile, I have a Ford Ranger Raptor pickup. Use US\$ and FT991a and ICOM 7300 MK2 (latest)

You're essentially building two serious stations:

1. **Mobile (Ford Ranger Raptor, HF + VHF/UHF)**
2. **Base (balcony-constrained HF station)**

I'll structure this like a field deployment checklist with **realistic US\$ pricing**, based on current market gear. I'll also anchor around your radios:

- Yaesu FT-991A (all-band, all-mode, ~100W HF + VHF/UHF)
- Icom IC-7300 (latest revision, HF/6m SDR)

👉 Typical price for FT-991A ≈ **\$1,300-\$1,400**

👉 IC-7300 ≈ **\$1,200-\$1,600** depending on bundle

🔧 PART 1 — BASE STATION (BALCONY HF SETUP)

🎯 **Key constraint:**

- **No full-size dipole**
- Must be **compact, low-profile, stealth-friendly**



Core Radio

- Icom IC-7300 HF Transceiver
 - 💰 ~\$1,300–\$1,600
 - ✓ Best-in-class HF SDR receiver
 - ✓ Ideal for digital modes (FT8, JS8Call, Winlink)



Balcony Antenna Options (Critical Choice)

Best realistic option (compact vertical):

- Xiegu VG4 Vertical Antenna
 - 💰 ~\$250–\$450
 - ✓ Covers 10–40m
 - ✓ Works on balcony with radials

Alternative (stealth / HOA-friendly):

- End-fed wire (DIY or commercial)
 - 💰 \$100–\$250

👉 Reality check:

Balcony HF = **compromise system**. You will rely heavily on:

- tuner
- radials/counterpoise
- noise mitigation



Power System

- 30A switching power supply (e.g. Samlex / Astron)
 - 💰 \$120–\$250



Antenna Tuner (VERY IMPORTANT)

- LDG AT-100Proll or similar

💰 \$180–\$300

👉 Even FT-991A's internal tuner is limited (~3:1 SWR range) → external tuner strongly recommended (confirmed by user experience)



Feedline + RF

- LMR-400 coax (50–75 ft)

💰 \$100–\$200

- Ferrite chokes (RFI suppression)

💰 \$30–\$100



Balcony Accessories

- Radial kit / counterpoise wires

💰 \$50–\$150

- Mount (railing clamp / tripod)

💰 \$50–\$150

- Lightning arrestor

💰 \$60–\$120



Digital Mode Setup

- USB cable (built-in sound card on IC-7300)

💰 \$10–\$20

- Laptop (you likely already have)



Audio

- External speaker

💰 \$50–\$150

- Desk mic (optional upgrade)
💰 \$100–\$300

Base Station Budget

| Category | Cost |
|--------------|------------------------|
| Radio | \$1,300–\$1,600 |
| Antenna | \$250–\$450 |
| Power supply | \$150 |
| Tuner | \$250 |
| Coax + RF | \$150 |
| Accessories | \$200 |
| TOTAL | \$2,300–\$2,800 |

PART 2 — MOBILE SETUP (FORD RANGER RAPTOR)

Design Reality:

HF mobile is **antenna-limited**, not radio-limited.

Core Radio

- Yaesu FT-991A Transceiver
💰 ~\$1,300–\$1,400
✓ One-box solution (HF + VHF/UHF + Fusion digital)
✓ Perfect for mobile + field

HF Mobile Antenna (MOST IMPORTANT COMPONENT)

Best choice: screwdriver antenna

- Diamond SD-330 Screwdriver Antenna
 - 💰 ~\$400–\$700
 - ✓ Motorized tuning while driving
 - ✓ Covers multiple HF bands

👉 This is the difference between:

- frustration ✗
- actual DX contacts ✓

Mounting System (Truck-specific)

- Heavy-duty bed mount / hitch mount
 - 💰 \$150–\$400
- Breedlove / custom mounts recommended

Power Wiring (CRITICAL)

- Direct battery connection (NOT cigarette lighter)
- 4–8 AWG cable + fuses
 - 💰 \$80–\$150

Mobile Audio

- External speaker (road noise mitigation)
 - 💰 \$50–\$120

VHF/UHF Antenna (Separate!)

- Dual-band NMO antenna
 - 💰 \$50–\$120

RF Bonding (Often overlooked)

- Ground straps (hood, bed, exhaust)
💰 \$50–\$150

👉 This dramatically improves:

- SWR
- noise floor
- transmit efficiency

SWR / Tuning Tool

- NanoVNA-F Analyzer
💰 ~\$80–\$150
✓ Essential for tuning mobile antenna

Mobile Budget

| Category | Cost |
|--------------|------------------------|
| Radio | \$1,300–\$1,400 |
| HF antenna | \$400–\$700 |
| Mount | \$200 |
| Power wiring | \$120 |
| VHF antenna | \$80 |
| RF bonding | \$100 |
| Accessories | \$150 |
| TOTAL | \$2,300–\$2,800 |

BASE vs MOBILE STRATEGY (IMPORTANT INSIGHT)

Why your combo works well:

- **IC-7300 → Base (best receiver, SDR waterfall)**

- **FT-991A → Mobile / Field (all-in-one flexibility)**

👉 This is a *very common high-end ham setup strategy*

Critical AMARS Deployment Considerations

If you're aligning with **Military Auxiliary Radio System (MARS)**:

Must-have additions:

- Wideband (MARS mod radio)
- NVIS antenna option (for regional comms)
- Portable power (LiFePO4 battery system)
- Backup antenna (end-fed wire)

Hard Truths (from experience)

1. **Antenna > radio (always)**
2. Balcony HF = compromise but workable
3. Mobile HF success = mounting + grounding + antenna quality
4. Expect noise issues in urban Cebu
5. Digital modes will outperform voice in weak setups

TOTAL SYSTEM COST (REALISTIC)

| Setup | Cost |
|-----------------|--------------------------|
| Base | \$2.3k – \$2.8k |
| Mobile | \$2.3k – \$2.8k |
| Combined | \$4,600 – \$5,600 |

If you want next step:

I can design a **Ranger Raptor-specific mounting layout + wiring diagram + antenna placement** (this matters a LOT), or optimize your balcony for **stealth + max DX performance**.

Got it — here's a **clean, structured tabulation** so you can quickly scan, budget, and deploy.

BASE STATION (BALCONY HF SETUP — IC-7300)

Core Equipment

| Category | Item | Example / Notes | Est. Price (USD) |
|---------------|-----------------------------|----------------------------------|------------------|
| Radio | Icom IC-7300 HF Transceiver | HF/6m SDR, excellent for digital | \$1,300–\$1,600 |
| Power Supply | 30A Switching PSU | Samlex / Astron class | \$120–\$250 |
| Antenna Tuner | External Auto Tuner | LDG AT-100Proll or similar | \$180–\$300 |

Balcony Antenna Options

| Category | Item | Notes | Est. Price |
|------------------|----------------------------|--------------------------|-------------|
| Vertical Antenna | Xiegu VG4 Vertical Antenna | Compact, multi-band | \$250–\$450 |
| Alternative | End-Fed Wire | Stealth-friendly | \$100–\$250 |
| Radials | Counterpoise Kit | Essential for efficiency | \$50–\$150 |
| Mounting | Balcony Clamp / Tripod | Railing or stand mount | \$50–\$150 |

RF & Cabling

| Category | Item | Notes | Est. Price |
|-------------|--------------------|--------------|-------------|
| Coax | LMR-400 (50–75 ft) | Low loss | \$100–\$200 |
| RFI Control | Ferrite Chokes | Reduce noise | \$30–\$100 |

| | | | |
|----------------------|-------------------|--------|------------|
| Lightning Protection | Arrestor + Ground | Safety | \$60-\$120 |
|----------------------|-------------------|--------|------------|

Digital + Audio

| Category | Item | Notes | Est. Price |
|------------|---------------------|---------------------|-------------|
| Interface | USB Cable | Built-in sound card | \$10-\$20 |
| Speaker | External Speaker | Cleaner audio | \$50-\$150 |
| Microphone | Desk Mic (Optional) | Upgrade TX audio | \$100-\$300 |

BASE TOTAL

| Section | Cost |
|-----------------------------------|--------------------------|
| Core + Antenna + RF + Accessories | \$2,300 – \$2,800 |

MOBILE SETUP (FORD RANGER RAPTOR — FT-991A)

Core Equipment

| Category | Item | Example / Notes | Est. Price |
|----------|---------------------------|-------------------------|-----------------|
| Radio | Yaesu FT-991A Transceiver | HF + VHF/UHF all-in-one | \$1,300-\$1,400 |

HF Mobile Antenna System

| Category | Item | Notes | Est. Price |
|--------------|------------------------------------|------------------------------|-------------|
| Main Antenna | Diamond SD-330 Screwdriver Antenna | Motorized tuning, multi-band | \$400-\$700 |
| Mount | Bed / Hitch Mount | Heavy-duty (Breedlove-style) | \$150-\$400 |
| Grounding | Bonding Straps | Hood, bed, exhaust | \$50-\$150 |

Power System

| Category | Item | Notes | Est. Price |
|--------------|------------------------|----------------------|------------|
| Power Wiring | 4–8 AWG Direct Battery | Fused leads required | \$80–\$150 |

VHF/UHF + Audio

| Category | Item | Notes | Est. Price |
|-------------------|-------------------------|----------------------|------------|
| Dual-Band Antenna | NMO Mount Antenna | For local comms | \$50–\$120 |
| Speaker | External Mobile Speaker | Road noise reduction | \$50–\$120 |

Testing & Tuning

| Category | Item | Notes | Est. Price |
|----------|--------------------|------------------------|------------|
| Analyzer | NanoVNA-F Analyzer | Tune antenna precisely | \$80–\$150 |





MOBILE TOTAL

| Section | Cost |
|-----------------------|--------------------------|
| Complete Mobile Setup | \$2,300 – \$2,800 |

COMBINED SYSTEM OVERVIEW

| System | Radio | Strength | Limitation | Cost |
|--------------|---------|-----------------------------------|------------------------|----------------------|
| Base | IC-7300 | Best receiver, SDR, digital modes | Balcony antenna limits | \$2.3k–\$2.8k |
| Mobile | FT-991A | All-in-one, field capable | Antenna efficiency | \$2.3k–\$2.8k |
| TOTAL | — | Full HF + VHF/UHF capability | Antenna-dependent | \$4.6k–\$5.6k |

QUICK PRIORITY TABLE (WHERE TO SPEND MORE)

| Priority | Component | Why |
|--|-------------------------------|----------------------------|
|  #1 | Antenna (both setups) | Biggest performance factor |
|  #2 | Mounting + Grounding (mobile) | Determines HF success |
|  #3 | Tuner (base) | Makes balcony viable |
|  #4 | Radio | Already high-quality |

Practical Deployment Notes

| Scenario | What Happens |
|------------------|---|
| Balcony HF | Works best on digital (FT8, JS8Call) |
| Mobile HF | Excellent for regional + NVIS with good bonding |
| Urban Cebu Noise | Expect high RF noise floor |
| Best Strategy | Operate HF early morning / late night |

If you want, I can next:

- Design a **Ford Ranger Raptor antenna placement diagram (exact mounting points)**
- Or optimize your **balcony antenna layout for stealth + maximum DX reach**

Gemini

This equipment list is tailored for a dual deployment: a versatile base station utilizing the ICOM IC-7300 (for its renowned HF performance) and a rugged mobile setup using the Yaesu FT-991A (which provides the necessary VHF/UHF capabilities for mobile AMARS/field operations).

Prices are estimated based on current listings at Ham Radio Outlet (hamradio.com).

1. Base Station Setup (Balcony Deployment)

Focus: Compact footprint with high performance for restricted spaces.

| Category | Item | Description | Est. Price (USD) |
|----------------------|------------------------|---|--------------------|
| Transceiver | ICOM IC-7300 | HF/50MHz SDR Transceiver (Latest Version) | \$1,099.95 |
| Power Supply | Alinco DM-330MV | 30 Amp switching power supply (low noise) | \$169.95 |
| Antenna | Comet UHV-6 | Multi-band compact vertical (HF/6m/2m/70cm) | \$179.95 |
| Antenna Mount | Diamond K400C | Heavy-duty trunk/hatch mount (works on railings) | \$74.95 |
| Coaxial Cable | DXE-213U | 50ft RG-213 Low Loss Coax with PL-259 connectors | \$85.00 |
| Grounding | MFJ-931 | Artificial Ground (Essential for balcony/no-earth setups) | \$129.95 |
| SWR/Wattmeter | Daiwa CN-901HP | 1.8-200MHz Professional Cross-Needle Meter | \$154.95 |
| Total Base | | | ~\$1,894.70 |

2. Mobile Setup (Ford Ranger Raptor)

Focus: Vibration resistance, multi-mode capability, and rugged mounting.

| Category | Item | Description | Est. Price (USD) |
|----------------------|----------------------------|---|------------------|
| Transceiver | Yaesu FT-991A | All-mode HF/VHF/UHF with C4FM Digital | \$1,199.95 |
| Antenna | ATAS-120A | Active Tuning Antenna System (Self-tuning with FT-991A) | \$389.95 |
| Antenna Mount | Diamond K400-3/8C | Heavy-duty lip mount for Raptor hood or tailgate | \$84.95 |
| Rig Mounting | Lido LM-300 | Floor bolt/Seat bolt gooseneck mount for control head | \$45.00 |
| Power Wiring | West Mountain Radio | Super-RigRunner 4005 (Fused DC distribution) | \$84.95 |

| Category | Item | Description | Est. Price (USD) |
|---------------------|----------------------|--|--------------------|
| Speaker | Yaesu MLS-100 | High-output external mobile speaker | \$49.95 |
| Duplexer | Comet CF-706 | Required to split HF and VHF/UHF leads | \$69.95 |
| Total Mobile | | | ~\$1,924.70 |

3. Support & Deployment Accessories

Common items needed for both setups to ensure AMARS compliance and data capability.

| Item | Description | Purpose | Est. Price (USD) |
|-----------------------------|-------------------------|--|------------------|
| Signalink USB | Radio-to-PC Interface | Digital modes (MT63, Winlink, ALE) | \$129.95 |
| Bioenno 20Ah LiFePO4 | Portable Battery | Emergency backup for the base or mobile engine-off ops | \$220.00 |
| NanoVNA-H4 | Vector Network Analyzer | Antenna tuning and troubleshooting in the field | \$70.00 |
| Total Accessories | | | ~\$419.95 |

Deployment Notes for the Raptor:

- **Bonding:** Due to the aluminum body panels and high-performance suspension of the Raptor, ensures you use braided copper bonding straps between the exhaust, bed, and frame to reduce RFI (Radio Frequency Interference).
- **Antenna Placement:** For the ATAS-120A, the driver-side hood ditch light bracket or a specialized bed-rail mount provides the best ground plane for HF frequencies.
- **Balcony Restrictions:** If your balcony has a metal railing, the Diamond K400 mount will allow you to use the railing as a counterpoise, which significantly improves the Comet UHV-6 performance.