RSAM - Rapid Structure Assembly Modules (Method)

RSAM: (1) **Modules** for RAPIDLY assembling (a) barriers in various configurations from single-soldier defensive positions (Fig.1) to large surrounds, and (b) enclosed spaces in varying sizes from containers (Fig.2 left) up to human occupancy from checkpoint booths (Fig.2), observation posts, command posts, barracks, bunkers, latrines, etc.

RSAM: (2) **Method** of minimizing materials, tools, machinery, skills, training, energy, manpower, time and other assets necessary to deploy, set up, protect, sustain and relocate any enterprise or military operation such as combat outposts, patrol bases or other temporary installations.

RSAM **modules** are used with any sheet material (plywood, OSB, corrugated metal, etc.) =>½" thick or less. When used to assemble barriers/enclosures of bullet resistant sheet materials (ArmorCore, Armortex) RSAM delivers superior security against bullets and blast fragments. RSAM plastic modules are primarily for use with common building materials; however bullet resistant materials can be used in limited fashion. RSAM metal modules (Fig.3) are primarily for use with heavier, bullet resistant materials as metal is more suited for impact resistance, and their design can provide greater protection along structure corners (Fig.4).

The RSAM **method** is a technique for ballistic survivability addressing performance, cost, and weight for soldiers and weapon system armor. RSAM armored systems utilize simple modules combined with proven composite materials. Deployed as individual modules, the system allows custom assembly using available materials. Fig.1 is one M3C module combined with two 36"X36" pieces of Level III Armorcore held together by gravity. The assembly can be bolted for stability, another module can be added for strength, panels can be doubled or tripled to increase protection, **but the initial defensive position is erected in seconds**! The panels (@50 lbs. each) easily mount to vehicles (adding armor) or are transported via travois, stretcher, cart or wagon. In areas devoid of indigenous materials for cover or site-prepared barriers, or when frozen ground forbids trenching or filling sandbags, RSAM is **instant** force protection. Sandbags can be added when time allows (Fig.5), but **protection is immediate with RSAM**. Long sandbag walls can withstand concussive force better when erected against a solid surface even if plywood, OSB, MDF or other wood product is utilized.

Deployment as pre-cut, pre-drilled, structure kits (Fig.2) provides the same **immediate** protection. The presence of RSAM kit materials allows for **immediate** utilization of armor components if necessary. Protection is provided at any level of assembly. The RSAM Ballistic Kit 4'X4'X8' example (Fig.2) ships as the pallet/crate combo shown. Tools are included; screwdriver for opening the crate, wrenches for assembly with ½" diameter bolts, nuts and washers. Structures can have an open wall for ingress/egress. Doors, windows and hatches are had using RSAM M1R hinge/latch modules. (A window/hatch is recommended for egress should concussive force topple the structure.) 30” screw in anchors can be included to add stability, as well as other components depending on anticipated use. Fig.6 shows an armor panel layer added to the lower half of structures to increase force protection (Level III X 2). The five upper panels and lower door panel can be assembled as a three panel thick, 4’ high structure for maximum protection. The ten panels can be assembled as five Fig.1 defensive positions if necessary.
RSAM structures require little or no ground preparation. Individual components of RSAM kits do not exceed 100 pounds and can be lifted/assembled by an individual (ArmorCore 7/16" level III 4'X4' max @4.8 lbs. PSF = 76.8 lbs., 15/32" plywood 4'X8' max @1.7 lbs. PSF = 54.4 lbs.) to increase manpower assets available for mission tasks. Pre-drilled, prefab, all-inclusive kits eliminate the need for other assets (tools, electricity) unavailable in austere, restricted terrains. Kits can contain PVC/tarp/bungee roofs for sun/rain protection (Fig.7). RSAM 1R modules (Fig.7) facilitate wall mounting of PVC from ¾" to 1½" i.d. The not-glued PVC frame threads through eyebolts for simplicity. The eyebolts allow airlifting of the structures. Only four bolts per 4'X4' panel, two bolts per hinge, RSAM kits assemble and disassemble in hours instead of days.

Fig.8 shows one simple trailering option (utilizing Humvee wheels/tires) for rapid deployment, to be tilted into place with wheels attached. 8' wide structures are similarly transported (upright) in areas without road restrictions.

The RSAM method is to utilize ordinary materials when possible so repair/replacement/customization in remote areas is less difficult. Fig.9 shows common 2" angle iron used to reinforce panels. RSAM braces (M1B not shown) are kit-included, but soldiers in the field also modify/enhance RSAM with whatever is at hand. ArmorCore/Armortex are modified using ordinary woodworking tools so damaged/destroyed components are easily duplicated in a rear area and need not be procured from a distant factory. A unit with access to RSAM modules and appropriate materials =<½" can field fabricate any desired structure.

Crates can be easily produced for deployment/shipment. Three sheets of plywood sawn into six squares and assembled with eight M3C modules (bolted or screwed) become a rapidly produced crate, easily broken down and reused/repurposed. Structures for occupation can be similarly field produced, but RSAM kits optimize materials and insure all required components, hardware and accessories arrive at a forward position. The BK081208 kit (Fig.10) has hundreds of bolts/nuts/washers. Utilizing standardized RSAM kit structures insures manpower assets are not diverted to field fabrication/inventory. Standardization also increases scavenging from damaged assets to reduce materials waste.

RSAM plastic modules (Fig.11) typically assemble structures of wooden panels. The lighter, less expensive kits provide better protection against the elements than tarps, tents or other membrane structures. In conflict areas not requiring full armor protection, armor panels can be added to the exterior of these structures using longer bolts and no other alterations.

The HKEZ081208 (Fig.12) plastic module and wood panel structure’s interior dimensions of 96"X144"X96" make it ideal for barrack, duty room, mess, aid station/surgery, or countless other uses. The added 48" high armor provides a defensive position if needed. Flame retardant wooden materials increase safety. Hinges are continuous plastic and factory applied. Door and window gaps have vinyl seals, also factory applied. Exterior surfaces are coated for the expected environment. The structure rests on a bolt-together joist system. The kit transports as a 48"X96"X18" pallet and a 48"X48"X25½" crate. Only labor is needed to assemble. Even a ladder is included. Smooth level ground is required for tents and most other membrane structures, or a wooden platform has to be erected. RSAM assemblies and disassembles quickly and completely without nails, screws or adhesives. With the PVC/tarp roof removed they can be trailered or airlifted. RSAM - R stands for Rapid!
RSAM - Force Protection - Basing

Technical Readiness: Three+ years of effort have taken RSAM to a high state of design. Computer modeling and computer animation helped develop components and assembly methods/procedures as well as providing clearly demonstrable ideas for scrutiny and validation. Individuals from varied arts and sciences gave valuable input; Afghanistan/Iraq theatre veterans included their experiences, accomplished business professionals have examined the concept from a materials/products standpoint. RSAM is ready for physical prototyping, then testing, limited production, and finally examination in the field.

RSAM modules are simple brackets and fittings without complex moving parts, electronics, or powered components. Armor composites exist and only require fabrication for use with RSAM. Physicality will allow refinement of assembly steps so instruction materials can be produced. C V Installation & Ergonomics (CVIE) is headed by Calvin Bennett (BA Finance), a certified ergonomist. Ergonomics is “the applied science of equipment design to maximize productivity by reducing physical effort and discomfort,” which is precisely what RSAM does. CVIE has excelled in this product-rich field for over fifteen years. RSAM will be another product line, but with CVIE as the manufacturer.

The RSAM team invented and designed RSAM as seen in the CGI here. Further engineering will be provided by Williams, Russell and Johnson, Inc. (Charles Thomas), Heske Consulting, Inc. (Ted Heske), ArmorCore, Inc., Peliton Plastics, Inc., Georgia Tech, Pro Twin Performance, and others. Bill Crossley (O7 US Army, Ret.), Dr. Alex Moore (MD), Joe Beasley (Joe Beasley Foundation), Smither Fallon (American Red Cross) as well as several military officers and employees CVIE has long associations with will contribute to every aspect of RSAM as an enterprise in government compliance, finance, intellectual property, legal, marketing, sales, human resources, operations and production. The RSAM team also encompasses a variety of inventors, tinkerers, outside-the-box thinkers, gearheads, builders, mechanical wizards, and product development gurus so no aspect of RSAM will be ignored or lacking.