

FOODSTUFFS

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FOODSTUFFS

Note: While most of these rations are based on US ration types, similar rations are available in the armies of most countries, making allowances for industrial level and capabilities.

A-Rations: This is a mixed ration of semi-perishable and perishable food, based on the UGR-H&S. In addition to the standard non-perishable UGR food containers, the A-Ration contains luxury items like concentrated juice instead of instant, pastries, cooking oil, pudding, cake, cookies, steak sauce, and generally better-tasting food items. Items such as UHT milk, irradiated bread slices, breakfast cereal, hot sauce, catsup, jelly, spices, napkins, paper towels, Styrofoam cups, fiberboard trays, and plastic utensils are also included. Some of the items in the A-Ration require refrigeration to keep properly. If properly kept, the A-Rations have a minimum shelf life of 5 months, and may keep much longer. One module feeds 75 persons, a tier feeds 150 persons, and a pallet feeds 600 persons. Required intake is 2.2 kg per day. Weight: (single module) 165 kg, (single tier) 325 kg, (pallet) 1310 kg; Price: (single module) \$985, (single tier) \$1575, (pallet) \$6290 (R/R)

B-Rations: These are primarily used by US Marines and special operations personnel in base camps. They are midway between the A-Rations and the UGR-H&S, having no perishable components, but providing more palatable food than the UGR-H&S. 10 breakfast and 10 lunch/dinner menus are provided, with items such as juice, scrambled eggs, potatoes, canned fruit, and dinner dishes ranging from beef and gravy to baked chicken, with vegetables. Accessory items margarine, peanut butter, jelly, coffee, cocoa, Kool-Aid, tea, fiberboard trays, cups, utensils, and trash bags. The food is very nutritious and filling. The ration is delivered in 200-meal pallets, and is strong enough to be parachuted or sling-loaded. Required intake is 1.3 kg per day. Minimum shelf life under poor conditions is 2 years. Weight: (pallet) 285 kg; Price: (pallet) \$1250 (R/R)

Beer (per liter): \$10 (S/S)

Candy (per kilogram): \$25 (S/S)

Chewing Gum (per kilogram): \$50 (S/S)

Chocolate (per kilogram): \$100 (S/S)

C-Rations: These are the predecessor of the MREs, first used by the US and Britain in World War 2. They were still being used by the US Marines as late as the early 1990s, and local variations were quite common during the Twilight War in China, Russia, and Third World nations. The ration consists of one can of meat or vegetarian dish, one can of fruit or vegetables, a can with a bread or cake item, a can with crackers, a can with peanut butter, cheese spread, or jelly, a pouch with a candy disc (usually chocolate, sometimes with a filling), and an accessory package with a spoon, salt, pepper, instant coffee, sugar, creamer, chewing gum, matches, a P-38 can opener, and toilet paper (enough for one act if you're careful). Some countries also supply them with cigarettes, usually 4-6 per C-Ration. Required daily intake is 2 kg. Weight (per ration) 1.1 kg, (per case of 12) 14 kg; Price: (per ration) \$9, (per case) \$85 (S/S)

Dehydrated Milk (per kilogram): Highly sought after in the Twilight 2000 world, almost as much as the UHT Milk, and it may also be consumed safely by the lactose-intolerant. \$15 (C/S)

Domestic/Common Food (per kilogram): Pre-prepared food such as field rations or locally made meals. Required intake is 2kg per day. \$4 (V/V)

Energy Bars/Energy Gel (per kilogram): High-calorie, high-carbohydrate food supplements. If packing energy supplements, reduce required food rations by one-third. This assumes that the energy supplements are accounting for a maximum of 1/3 of the caloric intake. If living off energy supplements alone figure 0.8kg required intake per day; however, increase daily water intake. Living off energy supplements for more than 3 days would be extreme. \$20 (R/R)

FPSAS (Food Packet, Survival, Abandon Ship): This is a minimal survival ration designed for storage on life rafts and life jackets and to be grabbed in a hurry when abandoning sinking ships. It consists of 6 calorically-dense cereal bars. It will minimize the effects of acute starvation, but does not provide full nutrition. It is hard on the digestive process and it is not recommended for consumption more than five days in a row except in extreme circumstances. Required daily intake is 0.13 kg. Minimum shelf life is 5 years. Weight: (per ration) 0.15 kg, (per case of 40) 21.77 kg; Price: (per ration) \$7, (per case) \$290 (S/S)

FPSGP-I (Food Packet, Survival, General Purpose, Improved): This ration is designed for shot-down aircrews. It is a lightweight, high nutrition rations consisting of compressed food bars (2 cereal, 3 cookie, and one sucrose), lemon tea mix, dehydrated soup, and dehydrated gravy. It is nutritious, but not very filling, can lead to constipation, and contains a minimum of protein to reduce the amount of water intake required. Daily required intake is 0.3 kg. Minimum shelf life is 5 years. Weight: (per ration) 0.32 kg, (per case of 24) 8.26 kg; Price: (per ration) \$13, (per case) \$250 (S/S)

HDR (Humanitarian Daily Ration): These rations are often given out to displaced populations living in refugee camps and devastated areas by government or relief organizations. They are designed to provide an inexpensive, but nourishing meal to people with moderate malnutrition. To appeal to the maximum number of people, the meals are vegetarian, with two entrees in each pouch, consisting of things such as bean salad and brown rice with lentils to lentil stew and red beans and rice. Foods are chosen for nutritional content and filling capability, as per haps as little as one meal may be provided per day. Other items such as crackers and peanut butter or jelly, flat bread, raisins, fruit bars, biscuits, and shortbread are also in the pouch. An accessory packet with red and black pepper, salt, sugar, matches, a moist towelette (alcohol-free), a napkin, and a spoon are included. Required daily intake is 1 kg. Minimum shelf life is 3 years. Weight: (per ration) 1.1 kg, (per case of 10) 12 kg; Price: (per ration) \$5, (per case) \$40 (S/S)

Hospital Ration Supplement (per kilogram): This is a package of easily digestible foods usually fed to hospital patients in field hospitals, especially those with abdominal wounds. The ration could be a supplement to normal foods or given as the whole meal, depending on the condition of the patient. Normal troops also liked to acquire these packs as a nice change of pace from standard rations. The pack consisted of cans of preserved fruit, concentrated orange juice, evaporated milk, instant coffee, condensed soup, canned meat, and tomato juice, as well as teabags, and packets of cocoa, breakfast cereal, and items such as plastic knives, spoons, and forks, straws, a roll of toilet paper, and a roll of paper towels. This package generally came in 5 kg and 10 kg sizes. Required intake is 2 kg per day. \$7 (S/R)

Insulated Food Container: This is not something to eat, but rather a way of keeping cooked and perishable food fresh and at proper serving temperature for at least two hours. It is basically a giant Thermos, about 64x43x24 centimeters in size, with a lid that is sealed tight with a gasket and three pans inside to hold the food. It will keep food at acceptable levels in temperatures ranging from -25 to 120 degrees Fahrenheit. Weight: 3 kg; Price: \$130 (V/C)

K-Rations: These are lightweight rations, sort of halfway between the freeze-dried LRRP Rations and the pre-packaged MREs. They were generally issued by countries unable to manufacture the LRRP Rations at light rations for long patrols and special operations units. Later in the war, they were issued by larger countries as a cheaper alternative to LRRP rations and a more-durable alternative to MREs. They were also produced by independent, local manufacturers in a variety of forms as emergency and survival rations for civilians. Typical contents were one can of chopped ham or turkey and egg mixture, a small pound cake, a freeze-dried biscuit, a fruit bar, a packet of coffee or cocoa, tablets of dextrose or malted milk balls, a packet of chewing gum or candy, one can of meat, potted meat, deviled ham, or chicken or turkey salad, and a daily dose of vitamins, along with a plastic spoon, a packet of salt, and toilet paper (enough for one act if you use it carefully). Required intake is 1.25 kg per day. Weight: (per ration): 0.42 kg, (per case of 12) 5.5 kg; Price: (per ration) \$6, (per case) \$60 (S/S)

Liquor (per liter): excluding moonshine (ethanol), \$6 (C/C)

LRP (Long-Range Patrol) Rations: These are freeze-dried, dehydrated, just-add-water rations, along with items such as ranger cookies, cookie bars, candy, powdered beverages such as Kool-Aid, cocoa, coffee, and apple cider. There is an accessory packet with a spoon, sugar, creamer, toilet paper (enough for 2 acts), matches, salt, and chewing gum. Required intake is 0.4 kg per day. Use of this ration for longer than 5 days at a time is not recommended, as it can cause digestive problems such as constipation and cramps. 8 menus are available. Weight: (one ration) 0.45 kg, (per case of 16) 9.07 kg; Price: (per ration) \$16, (per case) \$205 (S/S)

MCW/LRP (Meal, Cold Weather/Long Range Patrol): These combination rations were starting to be issued just before the Twilight War. They are designed for use by both troops operating in extreme cold and by Long-Range Patrol units. They come in bags similar to the RCW and MRE, with one bag per day being used for troops in normal climates and three bags per day for troops in extreme cold. 12 menus are available, ranging from oriental chicken with rice to a western omelet, with fruit or sports bars, crackers and peanut butter, cheese or jelly, candy bars, and items such as nut raisin mixes, ramen, cookies, granola bars, or nuts. An accessory packet with items such as Kool-Aid, lemon tea, cocoa, coffee, creamer, sugar, chewing gum, matches, hot sauce, moist towelette, toilet paper, salt, and a spoon if in the packet. Daily required intake is 0.55 kg in normal climate or 1.65 kg in extreme cold. Weight (per bag) 0.55 kg, (per case of 12 bags) 8.16 kg; Price: (per bag) \$12, (per case) \$115 (R/R)

MRE (Meal Ready-to-Eat): This is the standard ration of many armies, with countless variations all over the globe. They are packed in a weatherproof plastic pouch or box, with individual foil or plastic pouches within for the ingredients of the meal. In the US, 24 menu variations are available, with moist main entrees ranging from grilled beefsteak and chicken with noodles to a bean and rice burrito and meat loaf with gravy. Along with this is a side dish ranging from western beans and pound cake to Mexican rice and mashed potatoes. Other ingredients include beef jerky, hard candy, applesauce, cheese and crackers, and soft pretzels, and usually there are items such as crackers with cheese, jelly, or peanut butter. Rounding out the MRE are beverage powders such as Kool-Aid, cocoa, and coffee, a small bottle of hot sauce, or dehydrated fruits. An accessory packet is in the MRE containing a spoon, sugar, nondairy creamer, salt, chewing gum, matches, toilet paper (about enough for one act if you're careful), a moist towelette, a flameless heating device, and sometimes candy or apple cider. The minimum shelf life is about 3 years, but I have kept some MREs for 10 years that were still edible. Required daily intake is 1.7 kg. Weight: (per ration) 0.86 kg, (per case of 12) 10.3 kg, (per pallet of 576) 494 kg; Price: (per ration) \$8, (per case) \$77, (per pallet) \$3685 (C/C)

MREV (Meal, Ready-to-Eat, Vegetarian): This is similar to the MRE, but contains no food items derived from animals or animal by-products. 4 menus are available, and contain food items such as minestrone, beans and rice, and other bean dishes, along with crackers, peanut butter or jelly, potatoes, chocolate covered cookies, brownies and oatmeal cookie bars, cocoa or Kool-Aid, and a standard MRE accessory packet. All foods have been vitamin and mineral fortified to meet military nutritional requirements. Required intake is 1.7 kg per day. The minimum shelf life is 3 years. Weight: (per meal) 0.86 kg, (per case of 12) 10.3 kg, (per pallet of 576) 494 kg; Price: (per meal) \$10, (per case) \$95, (per pallet) \$3810 (S/S)

MRK (Meal, Religious, Kosher): This variant of the MRE is designed to meet the needs of Jewish and Islamic soldiers. It is based on meals acceptable to those groups, most notably without those items based on pork and ham (amongst other things). A similar meal exists, largely in South Asia, for Hindu troops, who cannot eat beef. The meal comes in two bags, one with the entrée/meal items, and one with accessory items such as are normal in MREs and snack items such as tea, coffee, hot or cold cereal, items such as bagel chips or granola bars, and sealed containers of fruits or nuts such as raisins, prunes, peanuts, or almonds. It has a somewhat shorter shelf life, starting at 10 months. 10 menus are available. Required intake is 1.7 kg per day. Weight: (per ration) 0.86 kg, (per case of 12) 10.3 kg; Price: (per ration) \$10, (per case) \$95 (S/S)

Pouch Bread/Pastries: Pouch bread was first introduced to coalition forces during the 1990-91 build up to Desert Storm. It rapidly became a hit, and is much sought-after to improve the soldier's lot in life. It is basically a small loaf of bread sealed in a foil or plastic pouch, treated with preservatives, stabilizers, water-control agents, and oxygen-scavenging sachets to keep the bread fresh at least three years at normal storage conditions. Shortly before the Twilight War, this technology was extended to some other items, such as brownies, cookies, pop-tarts, pound cake, and other such items, and these were likewise well received, with morale being improved in units where these items were available. The pouch bread and pastries were not intended to be ration-replacing items, and so are not as nutritious as rations, but one may replace one-quarter of the weight of pouch bread or one-fifth of the weight of pouch pastries with an equivalent amount of rations (thus, 1 kg of pouch bread may replace 0.25 kg of rations for nutritional purposes). Weight: (per pouch of bread) 0.25 kg, (per case of 24 pouches of bread) 7 kg, (per pouch of pastry or cookies) 0.15 kg, (per case of 40 pouches of pastry or cookies) 7 kg; Price: (per pouch of bread) \$1, (per case of bread) \$20; (C/S); (per pouch of pastry or cookies) \$2, (per case of pastry or cookies) \$60 (S/-)

RCW (Ration, Cold Weather): These are rations designed for extreme cold weather to resist cold and to meet the extra caloric requirements of individuals operating in extreme weather. The food is either low-moisture or freeze-dried, and the rations consist of two bags (Bag A and Bag B). Bag A consists of high-fat foods, largely oatmeal, cocoa, apple cider, chicken noodle soup, fruit bars, crackers, and an accessory packet for the meal with a spoon, coffee, nondairy creamer, sugar, chewing gum, toilet paper, and matches, and hexamine heat tabs. Bag B has the main entry; 6 menus are available, from chicken stew to spaghetti and meat sauce, along with granola bars, cookies or brownies, instant orange drink, a toffee roll, chocolate covered cookie, and lemon tea. All ingredients are fortified with extra vitamins, electrolytes, and carbohydrates, as well as fat, while limiting sodium and protein to reduce the risk of dehydration. Shelf life is a minimum of 3 years. Required daily intake is 1.2 kg. A case consists of 6 rations (one for each menu available). Weight: (per ration) 1.25 kg, (case) 9.67 kg; Price: (per ration) \$10, (per case) \$62 (R/R)

Russian Field Rations (per 2-kilogram box): A standard ration pack (intended to last one day) is contained in a 175x145x135mm cardboard box. The package contains two 300-gram cans of meat (various types, none being particularly appetizing), a lump of black bread (prepared for long-term storage, meaning it must be soaked in tea or water, before it can be eaten), two grams of tea, and nine small packs of sugar. There is no seasoning, not even any salt, and none of the accessories (utensils, matches, toilet paper, etc.) found in MREs. \$8 (R/C)

Shelf-Stable Pocket Sandwich: These were first issued to US soldiers in early 1995, and production was quickly ramped up in order to provide easy meals to soldiers in the field and in active operations. They are basically hollowed-out Pouch Bread filled with a variety of fillings, from roast beef to turkey to ham to vegetarian meals like alfalfa sprouts and cheese. They proved immensely popular with troops, and due to ease of use and consumption were issued as rations to many troops who did not have time to stop and eat a meal. When NATO and Israeli troops saw what the US soldiers had, they demanded the same, and with a couple of months they were being produced by many NATO countries, as well as by Israel. Required intake is 1.5 kg per day. The pocket sandwiches keep at least three years if unopened. Weight: (per sandwich) 0.35 kg, (per case of 24) 9.5 kg; Price: (per pocket sandwich) \$5, (per case) \$96 (C/-)

TOTM (Tailored Operational Training Meal): These are pre-packed meals used primarily to feed trainees, garrison and armory personnel, and other low-priority feeding needs. In the US, hundreds of thousands were handed out by FEMA after the November Nuclear Strikes. They are low-bulk, high-nutrition meals designed to not take up much room (typically, the pockets of a military uniform). The packaging is similar to an MRE, but in more commercial packaging, and often with civilian equivalents to MRE items. There are also things not normally found in MREs, such as preserved fruit, moist towelettes, napkins, and red pepper. One case contains 12 meals, and a pallet contains 600 meals. 18 menus are available, and a case typically 6 menus in sets of 2. Required daily intake is 1.9 kg per day. Weight: (per meal) 0.76 kg, (per case) 9.07 kg, (per pallet) 464 kg (C/S)

Transdermal Nutrient Delivery System (TNDS): This is similar technology to the nicotine patch for people quitting smoking, but instead of delivering nicotine, the TNDS delivers a concentrated dose of vitamins, minerals, and other nutrients to the wearer. These patches were generally issued only to NATO and Israeli special operations units who were on high-intensity missions for use when there was no time for an extended period for eating. There was a rumor that these patches were also treated with steroids and adrenaline, but this was never confirmed. These patches were never meant as a total replacement for rations, and could replace about one-quarter of the daily requirements of rations per day, with two being used per day. They do not alleviate the hunger pains or stomach growling caused by lack of food. Some of these patches were also used by astronauts and pilots on long missions, but they are more rare in those applications. Weight: (per pack of 10) 0.1 kg; Price: (per pack) \$500 (-/-)

T-Rations: In bivouac, the normal ration is A/C/A, or hot breakfast, MRE lunch, and hot dinner. This requires the mess section to cook twice daily, and keeping food fresh and restocked presents logistical problems. The T-Ration is a pre-prepared meal kit consisting of sealed metal trays of entrees and side dishes such as meat, scrambled eggs, lasagna, etc., and items like canned fruit and vegetables, designed to feed multiple (18) soldiers per tray. They are heated by boiling the trays in water for a specific time. This system lessens mess personnel staffing requirements and eases preparation. There are 7 breakfast and 14 lunch/dinner menus. A module also contains various instant beverages, nondairy creamers, hot sauce, jelly, Styrofoam cups, cardboard plates, and utensils. The T-Rations are normally supplemented with irradiated, individually wrapped bread slices, UHT Milk (both provided with the modules), and locally procured salad (which became harder to get as the war wore on). Required intake is 2kg per day. The T-Rations are designed to last a minimum of 3 years under poor conditions, and if kept carefully, can last much longer. A can opener is required to open the tins. Weight: (single module) 42 kg, (pallet of 24 modules) 1010 kg; Price: (single module) \$215, (pallet) \$4125 (S/R)

UGR-H&S (Unitized Group Ration-Heat & Serve): These are evolutionary developments of the T-Rations, designed to replace them. They are easier to open, vitamin and mineral-fortified, and packed in lighter containers. There is an arctic supplement to the UGR-H&S that provides an additional 914 calories per soldier per day; this supplement costs and weighs an additional 60%. The modules are essentially similar to the T-Rations, but are somewhat more nutritious and are larger. The UGR-H&S has a minimum shelf life of 18 months under poor conditions, and normally last far longer. One module feeds 50 people, one tier feeds 100 people, and a pallet feeds 400 people. Required intake is 1.9 kg per day. Weight: (single module) 95 kg, (single tier of 2 modules) 190 kg, (pallet of 8 modules) 760 kg; Price: (single module) \$570, (single tier) \$905, (pallet) \$3630 (R/R)

UHT (Ultra-High Temperature) Milk: These are small, single-serving boxes of milk that have been specially treated to kill all microbes and keep fresh even under high temperatures without refrigeration. (Nothing like the taste of warm milk on a hot day!) The container comes with a straw. Several variations are available, including whole and 2% versions of white, chocolate, and strawberry. A single box provides 236 ml of milk. These items were highly sought after by soldiers and civilians alike, especially mothers with infants. Minimum shelf life under poor, high-temperature conditions is 10 months, and most last for several years, if unopened. Weight: (single box) 0.25 kg, (case of 27) 6.75 kg, (pallet of 3240) 825 kg; Price: (single box) \$7, (case) \$150, (pallet) \$18,000 (C/R)

Water, DE (Drinking, Emergency): These are plastic pouches of distilled water for emergency use by aircrews and life raft occupants for use after a crash, bailout, or ship sinking. They are guaranteed fresh for 5 years after manufacture, and contain 118 ml of water each, with a nipple for drinking. Weight: 0.12 kg, 3 kg per case of 24; Price: \$2, \$38 per case (C/C)

Water, DS (Drinking, Sterile): This is a larger container of emergency water, also used by medical personnel. It is packaged in a rigid plastic bottle, and contains 473 ml of water. Weight: 0.5 kg, 12 kg per case of 24; Price: \$8, \$150 per case (S/S)

Wild Food (per kilogram): Foraged food such as berries and tubers and hunted food such as deer. Required intake is 3kg per day. \$2 (C/C)

Wine (per liter): \$20 (S/S)

FUELS

Aviation Gasoline (AvGas) (per liter): Price \$60 (R/R)

Butane (per liter): \$10 (S/S)

Diesel (per liter): Price \$40 (R/R)

Ethanol (per liter): \$8 (C/C)

Gasoline (per liter): Price \$48 (R/R)

Hexamine Heat Tabs: Weight: 0.2 kg per package of 12; Price: \$10 per package (S/R)

Methanol (per liter): \$4 (V/V)

Motor Oil (per liter): \$15 (S/S)

Propane (per liter): \$20 (S/S)

Rifle Bore Cleaner (RBC) (per liter): \$10 (S/S)

Transmission Fluid (per liter): \$15 (S/S)

Drum, 200-liter: Normal steel or aluminum drum, though plastic is becoming available. Weight: 10kg; Price: \$30 (V/V)

FLEXCEL Liquid Container: This is the large rubber fuel bladder so often seen slung underneath Chinook helicopters during Gulf War footage. These bladders can be parachuted without using a pallet or any sort of padding, can survive a fall of 100 meters without a parachute, or a fall of 12 meters from an aircraft moving at 170kmh (ComMov 137). Fuel is pumped by putting a heavy weight on the bladder (normally, the vehicle receiving the fuel runs over the bladder), and the bladder can typically be emptied in 25 seconds. A FLEXCEL comes in two sizes, a large (2.6x0.36m) and a small (1x0.2m). Large FLEXCELS hold 250 liters; small ones hold 45 liters. Weight and cost include hoses and valves. Weight: (250L) 56.7kg (45L) 10.3kg; Price: (250L)\$150 (45L)\$30 (V/S)

Jerry Cans, 20-liter: These are the standard cans for fuel and water. Fuel cans are normally metal, while water cans are plastic. Weight: 1 kg; Price: \$5 (V/V)

Rubber Fuel Bladder, 50-liter: Collapsible fuel bladder. Fuel may be pumped by placing a heavy weight on the bladder (squashing it with a vehicle is the normal method). Includes hoses and valves. These bladders can be safely airdropped from a height of 100 meters without a parachute. Weight: 3kg; Price: \$200 (S/R)

Rubber Fuel Bladders, NATO: This is a generic category of fuel bladders, used by many countries since they take up far less space than the usual assortment of jerry cans and 200-liter fuel drums found at other fuel dumps. These are normally shaped like a giant rubber pillow (unlike the drum-shaped FLEXCELS), and do not have the strength of a FLEXCEL; the bladder will need a pallet for a parachute drop, and can be free-dropped only 50 meters, or from aircraft moving at a maximum of 80kmh without preparation. Many sizes are generally available. All of these bladders will collapse to 15% of their normal size when empty. Weight and cost include hoses and valves, and fuel is pumped by squashing (requiring 3 phases per liter to empty). Weight (210L) 19kg, (380L) 34kg, (945L) 42kg, (1,890L) 48kg, (1,950L) 50kg, (2,840L) 52 kg, (3,785L) 62kg, (5,670L) 68kg, (7,570L) 77kg, (9,460L) 83kg, (11,355L) 97kg, (15,140L) 102kg, (18,295L) 117kg, (28,380L) 151kg, (37,850L) 169kg, (56,775L) 197kg (75,710L) 273kg, (189,300L) 564kg; Price (210L) \$95, (380L) \$170, (950L) \$420, (1,890L) \$850, (1,950L) \$875, (2,840L) \$1275, (3,785L) \$1700, (5,670L) \$2550, (7,570L) \$3400, (9,460L) \$4250, (11,355L) \$5100, (15,140L) \$6800, (18,295L) \$8200, (28,380L) \$12375, (37,850L) \$16500, (56,775L) \$24750, (75,710L) \$33000, (189,300L) \$82500 (S/R)

Rubber Fuel Bladder, Warsaw Pact/Eastern Bloc: Similar to the NATO fuel bladders above, the size of these bladders is based on metrics instead of gallons. They are often used to convert flatbed trucks to makeshift fuel tankers. Weight (4,000L) 125kg, (6,000L) 135kg, (25,000L) 290kg, (50,000L) 580kg, (150,000L) 1050kg, (250,000L) 1450kg; Price (4,000L) \$3400, (6,000L) \$5100, (25,000L) \$21250, (50,000L) \$42500, (150,000L) \$127500, (250,000L) \$212500 (R/S)

GENERATORS

Generator, Compact: A compact generator used by mountain troops and special forces. It is only 10x10x15cm and extremely efficient. Wt 5kg, Fuel Cons 1/4L per period (G,AvG,A); Output 400watts; Cost \$300 (C/S)

Generator, Solar, M85: A backpack-style solar panel set. Its folded size (22x12.5x5cm) expands (100x22x0.4cm) and can be set up on its own frame or hung from a tree, vehicle, or man's back. It can charge one 12- or 24-volt battery per period provided there is strong sunlight. Wt 2.2kg, Output 21 watts, Price \$600 (C/S)

Generator, Hand-Cranked, M91: A small, folding generator designed primarily to give radios periods of extended range (usually triple the radio's normal range). Operating this generator counts as hard labor for one period, though one person can operate it for two half-hour segments once per period. It could be operated in shifts, but broadcast times are kept short to avoid eavesdropping, jamming, and detection. Wt 2kg, Output 1Kw (Maximum); Price \$200 (C/C)

Solar Panel, Flexible: This 102x33-centimeter panel rolls up to 102x3 centimeters. Laid out on a car or truck's hood or roof, for example, and hooked to the battery, it will keep the battery charged during daylight and light cloudy conditions, or under electric lights. Hooked into the vehicle's mains (a little more ticklish), and it will provide power to the vehicle's electronics, including radios, GPSs, RDFs, etc. Hooked into a GSR, it will provide enough power to run one during, again, daylight or light clouds. Other examples are possible. Such a solar panel will provide a constant 1kW of power during daylight or light clouds or electric light (when rolled out); at night, the panel's associated battery will remain charged for up to five hours of use. A full charge takes eight hours to develop, though it can run at one-half power during this time. Wt: 4 kg, Output: 1kW (maximum), Price \$400

8x8x10' Refrigerated Container: Similar to the 8x8x20' container listed below, this is scaled to fit smaller vehicles. They are usually scaled to fit a truck of at least 3 tons in size. The container comes with an integral 5kW generator to power it. They are approximately 8x8x10 feet (2.5x2.5x3 meters) in size, and contain 320 cubic feet (98 cubic meters) of refrigerated space. The internal temperature may be kept from 0-40 degrees Fahrenheit (-18 to 4.5 degrees Celsius). As with the larger container, these containers are used to transport and store large amounts of perishable food, medical supplies, or human bodies. It has hooks to enable it to be sling-loaded. Weight: 2.6 tons; Fuel Cons: 5 liters per period; Price: \$17,000 (S/R)

8x8x20' Refrigerated Container: These are usually scaled and based to fit a truck of at least 7 tons capacity in size. As the name says, they are approximately 8x8x20 feet (2.5x2.5x6 meters) in size, and have 800 cubic feet (244 cubic meters) of usable refrigerated volume. The container comes with an integrated 10kW generator to power it. The internal temperature may be maintained from 0-40 degrees Fahrenheit (-18 to 4.5 degrees Celsius). These containers are generally used to transport and store large amounts of perishable food, medical supplies, or human bodies. Weight: 6.4 tons; Fuel Cons: 7 liters per period; Price: \$42,000 (S/R)

Camp Stove: 2 large and 1 small burner. Includes windscreen, and a case that can be used as a stew pot. Wt 5.4kg; Fuel Cons 0.75 Liter/period; Price \$100 (S/R)

H-45 Space Heater: This is a milspec space heater that burns fuel instead of requiring a generator. It is a 45,000 BTU heater that provides enough energy to heat a building, container, or tent of approximately 400 square feet (122 square meters) in size, to comfortable temperatures. It is effective in temperatures ranging from -30 to 60 degrees Fahrenheit (-35 to 16 degrees Celsius). The heater can burn most available liquid fuels, such as gasoline, diesel, butane, propane, or even AvGas. Its construction provides smokeless combustion. The heater includes flexible smokestack, gravity feed adapter, hoses, and a fuel can. Weight: 29 kg; Fuel Cons: 4 liters per period; Price: \$700 (S/R)

Mounted Water Ration Heater (MWRH): This device is used to heat water, which can then be used for hot drinks, to heat pouched or canned rations, or to provide hot water for hygiene purposes. It can heat 3.75 liters of water to boiling in 20 minutes. The basin is large enough to hold up to 5 MRE entrees at once. There is a spigot on the front of the device to dispense water for beverages or hygiene purposes. The device can be set to heat and keep water heated to any temperature up to boiling. This device is designed to be installed in a vehicle, and runs off vehicle power. They were increasingly common on NATO vehicles during the Twilight War, being installed or retrofitted to many vehicles through early 1999. They can be installed successfully on any armored vehicle with an Easy: Mechanic or Electronics roll, or a Difficult: Intelligence or Education roll. Weight: 4.5 kg; Price: \$40 (C/R)

Nonflammable Ration Heater (NRH): This small device, issued with most Western MRE-type meals, is designed for individual heating of meal components in water. The device consists of a long plastic bag and two packets of chemicals. The chemicals are poured into the bag, water added to the fill line, and the bag sealed. It is then placed into a container of water. The device is able to heat all the applicable parts of an MRE to 140 degrees Fahrenheit in less than 15 minutes. The NRH is cheap, produces no toxic fumes, and is very light. These devices were also available on the civilian market in Western countries starting in 1995. Weight: 0.06 kg; Price: \$1 (V/S)

Pocket Stove: This device was approved for issue to NATO troops in 1996; prior to this, it had been available on the civilian market for at least half a decade. It is a small stove with a stand and a fuel can, and burns diesel, aviation gasoline, or gasoline. Approximately 30 ml of fuel is added to the basin below the stand; this much fuel will burn for about 10 minutes and heat a half a liter of water to boiling. The stove cools to storable levels in about 5 minutes. These stoves were issued on an individual basis to personnel in NATO light units, airborne and air assault units, and special operations. A similar unit was made for Pact units, but was much more rare. Weight: 0.4 kg; Price: \$14 (S/-)

Remote-Unit Self-Heating Meal Module (RUSHMM): This is a device for heating A-Rations, B-Rations, or T-Rations without the cooking overhead normally required. The device comes in a cardboard box. The box is opened, the rations placed on top of the heating element and the box closed again. A tab is pulled, and the device heats the rations in about 20 minutes. Though the device does produce a small amount of smoke, the smoke is non-toxic and does not smell. There are no open flames, and are self-contained. After use, the device is discarded. These were originally designed for airborne and special operations use in remote areas, but most of these units did not use the high weight A, B, or T rations and did not normally carry the RUSHMM. As such, they were generally used in rear areas to feed sudden large influxes of troops or refugees. One of these modules is sufficient to heat the rations for about 18 people. Weight: 5 kg; Price: \$95 (C/R)

Space Heater Arctic (SHA): This device is similar in concept to the H-45 space heater, but is used in smaller spaces and in colder climates. It is useful in buildings, containers, and tents of approximately 230 square feet (71 square meters), and is effective in temperatures from -60 to 60 degrees Fahrenheit (-51 to 16 degrees Celsius). Weight: 18.6 kg; Fuel Cons: 2.5 liters per period; Price: \$650 (S/R)

Space Heater Convective (SHC): This is a larger heater, designed to heat larger buildings, field hospitals, command post complexes, and other such areas. It will provide a comfortable climate to an area of about 640 square feet (198 square meters). The burner is an enhanced-efficiency design, and uses the burned fuel to provide power to the electrical convection cells. The system includes blowers, fuel pumps, safety devices, and an electrical control box. The heater may be set up outside or inside a structure. The device is effective in an outside temperature of -40 to 60 degrees Fahrenheit (-40 to 16 degrees Celsius). Weight: 33.6 kg; Fuel Cons: 5.5 liters per period; Price: \$1100 (S/R)

Space Heater Small (SHS): This is a small military space heater meant to provide a comfortable temperature to small tents up to 100 square feet in size. It may burn all sorts of military fuels, including butane, propane, diesel, gasoline, and aviation fuel. The design provides for combustion without smoke and a minimum of fuels. The heater includes a smoke pipe and integral fuel tank, and takes up a minimum of space (approximately 35x22x41 centimeters). It is effective in temperatures ranging from -60 degrees Fahrenheit to 60 degrees. Weight: 9.07 kg; Fuel Cons: 1 liter per period; Price: \$275 (S/R)

Squad Stove: This stove has one gas burner, and the case serves as a pot. The device burns butane, kerosene, gasoline, diesel, or aviation fuel. They were typically used in lower-priority units where the Pocket Stove was not available, and they were also available on the civilian market for about 15 years before the war. Weight: 0.71 kg; Fuel Cons: 0.25 liters per period; Price \$25 (C/S)

Tommy Cooker: Folding stove, made from simple steel stampings. Uses Hexamine "heat tabs". One tab will boil a liter of water in 15 minutes. Wt 0.2kg; Price \$5 (S/R)

TACTICAL LIGHTING AND SIGNALS

[Signal Device Rules](#)

[Signaling Devices](#)

MEDICAL SUPPLIES

Blister Treatment Kit: One of the banes of a soldier's existence is blisters. This kit contains moleskins, gauze, paddings, "Second-Skin" blister pads, antiseptic gel, and sterile needles. The kit is sufficient to treat 50 blisters. It will not be sufficient to provide more than surface protection for blister gas injuries in a very small area. Wt 0.1kg; Price \$50 (S/R)

Cravat (1x1m): A triangular or square muslin sling. It is also used as bandanna or dust mask (drive-on rag), or any number of improvised uses. Wt 0.05kg, Price \$4 (V/V)

Emergency Blanket: Commonly called a space blanket due to it's space-age look, this is a blanket that seems it wouldn't keep a potato warm. However, placed over a casualty in shock, it's Mylar construction will keep a casualty toasty warm and will seal out 50 degrees of temperature. It is easily molded around a victim. It's not used as a general purpose blanket due to its fragility. A secondary use for the space blanket is to signal aircraft. It folds into a small package, and is found in many survival and field medical assortments, as well as vehicular first aid kits. Wt: 0.1 kg; Price \$11

Field Dental Kit: A small kit for use by characters with Medical (Surgical) skill who also have dental knowledge. It is, however, designed for use by amateurs (with constant reference to the instructions). It does not necessarily provide the materials for a permanent solution to dental problems. The kit contains:

10 gauze pads (100x100mm)	1 forceps
1 pair tweezers	1 dental mirror
25 cotton balls	100g filling material
100 units toothache remedy	10 units local anesthetic
1 mixing dish	100g cementing material
1 spatula	1 set dental instructions

Wt 0.3kg; Price \$700 (R/R)

Field Dressings: Bandages used to bind typical wounds; they consist of a pad with muslin or cotton strips. Many sizes are available, but three are given. The size given is the size of the pad; consider the bandage to have a long enough binding strip to accomplish the task.

Small: The normal size found in first aid kits and personal medical kits. 100x180mm. Wt: 0.05kg; Price \$4 (V/V)

Medium: Also found in most medical kits (but not the personal medical kit). 190x203mm. Wt 0.11kg; Price \$9 (V/V)

Large: Found in larger medical assortments, and used for large wounds such as burns, chest wounds, and shotgun wounds. 300x300mm. Wt 0.25kg; Price \$20 (C/C)

Field Medical Assortment #1: A kit typically carried by medics, nurses, and doctors. This kit contains:

12 Band-Aids (various sizes)	6 butterfly bandages
6 gauze pads (100x100mm)	1 compress bandage (100mm)
2 rolls gauze (25mmx5m)	1 wire mesh splint (1m)
1 thermometer	1 pair tweezers
10m sutures	3 surgical needles
1 needle	1 razor blade
1 bar antibacterial soap (100g)	100 units mild pain reliever
100ml antiseptic	6 antacid tablets
10 alcohol pads	1 zip-lock plastic bag

Wt 0.6kg; Price \$500 (S/S)

Field Medical Assortment #2: A larger version of the above. The kit contains:

32 Band-Aids (assorted sizes)	4 adhesive knit (25x75mm)
3 suture strips	10 gauze pads (100x100mm)
1 compress bandage (190x203mm)	10 Telfa pads (75x100mm)
6 butterfly bandages	2 eye pads
1 compress bandage (100x180mm)	1 compress bandage (300x300mm)
2 rolls gauze (50mmx5m)	2 moleskins (75x100mm)
1 cravat (1x1m)	1 elastic bandage (75mmx2.5m)
1 wire mesh splint (1m)	1 pair vinyl examining gloves
1 pair EMT shears	1 forceps
1 hypothermia thermometer	6 surgical needles
1 needle	20m sutures
2 razor blades	4 safety pins
10 cotton swabs	20 alcohol pads

2 bars antibacterial soap (100g)	20ml plastic bottle
100ml antiseptic	100g antiseptic gel
100 units mild pain reliever	10 units mild sedative
10 units strong sedative	8 antacid tablets
10 units antihistamine	20 salt tablets

Wt 1.4kg; Price \$800 (S/S)

Field Surgical Kit: A set of stainless steel instruments for use in emergency operations. These instruments are often seen in the hands of special forces medics and civilian paramedics. The instruments come in a zippered cloth pouch with an emergency surgery manual. The kit also contains, in sterile pouches (upon first use):

1 suture kit (20 operations)	20 scalpel blades
1 pair bandage scissors	1 pair tweezers
10 units local anesthetic	10 units +/- antibiotic
1 set prep pads (20 operations)	1 pair suture scissors
2 pair forceps	1 scalpel handle w/blade
10 units total anesthetic	1 penlight

Weight 1kg; Price \$450 (S/S)

First Aid Assortment #1: This is an assortment of minor medical supplies assembled into a kit. This first aid assortment contains:

8 Band-Aids (various sizes)	2 gauze pads (100x100mm)
2 Telfa pads (100x75mm)	1 roll medical tape (25mmx10m)
1 safety pin	1 razor blade
1 bandage compress (100mm)	1 roll of gauze (25mmx5m)
1 moleskin (75x100mm)	1 needle
4 alcohol pads	

Wt 0.25kg, Price \$40 (C/C)

First Aid Assortment #2: Another assortment of medical supplies. This first aid assortment contains:

12 Band-Aids (various sizes)	4 butterfly bandages
4 gauze pads (100x100mm)	4 Telfa pads (100x75mm)
1 bandage compress (100mm)	1 roll gauze (25mmx5m)
1 roll medical tape (25mmx10m)	1 moleskin (75x100mm)
1 cravat (1x1m)	1 pair tweezers
1 needle	4 safety pins
1 razor blade	6 alcohol pads

Wt 0.4kg; Price \$65 (C/C)

First Aid Assortment #3: A larger first aid kit, normally found in a plastic box issued with US and NATO vehicles. The kit features a set of first aid instructions that allow a +2 Medical (Trauma Care) during first aid attempts.

1 pair EMT shears	1 pair tweezers
10 safety pins	50ml antiseptic
1 Carlisle dressing	5 alcohol pads
1 roll gauze (25mmx5m)	50 units mild pain reliever
3 compress bandages (100mm each)	100g antiseptic gel
1 thermometer	100ml burn mixture
20 cotton swabs	2 rolls medical tape (25mmx10m each)
100ml petroleum jelly	2 Telfa pads (75x100mm)
10 salt tablets	1 cravat (1x1m)

Wt 0.8kg; Price \$250 (C/C)

First Aid Assortment #4: A small assortment normally issued to airborne troops. This first aid kit contains:

10 Band-Aids (various sizes)	50ml antiseptic
1 roll gauze (25mmx5m)	1 roll medical tape (25mmx10m)
1 compress bandage (100mm)	25 units mild pain reliever
25 units mild sedative	1 cravat (1x1m)
4 safety pins	4 alcohol pads
100g antiseptic gel	1 pair small scissors
1 pair tweezers	

Wt 0.45kg; Price \$100 (S/S)

Insect Repellent: Known as "bug juice" to troops; this also liberally issued to troops. Wt 0.1kg; Price \$2 (V/V)

Iodine Tablets (100 units): Makes water safe to drink, but leaves a strong metallic taste. One unit is sufficient to treat one quart of water; 30 minutes are required for the iodine to work. Wt 0.05kg; Price \$30 (~/V)

Israeli Pressure Bandage: This is appropriate for an arm, leg, ankle, foot, wrist, or hand. It is designed, once fixed in place, to provide content and firm pressure directly to a wound, and mold itself to the wound. This will stop $\frac{3}{4}$ of hit points being lost from bleeding.

ITS Tactical ETA: This set was put together by an 18D (Special Forces Medic). And is designed to tread the line between not enough and too much. It is meant to be a light bag for assistant medics and combat lifesavers. The bag is small and holds a two-pack Combat Dressing, a pack of "Combat Gauze" – a standard pressure bandage impregnated with the material in QuikClot, used to not only apply pressure to wounds, but to quickly promote clotting. A third type bandage has an outer surface of hook-and-loop fasteners (Velcro). The Halo bandage is large, oval in shape, and 225 millimeters wide. It has a sticky back, and comes in a three-pack. It is designed to seal wounds like sucking chest wounds and abdominal wounds. A standard ACE-type bandage, 200 millimeters wide and 20 meters long, with clips, is included for GP uses. A pair of Nitrile gloves are included so as to not contaminate wounds, and a small bottle of hand sanitizer is also packed. A combat casualty card, detailing a casualty's condition is included, as well as a pencil (with eraser).

Weight: 1.5 kg; Price: \$150

Medic Bag, "Airborne": So called because these pouches were first designed for paratroopers in WW II. The pouch is hard in order to resist crushing. Holds 2.5kg; Wt 0.2kg; Price \$15 (C/C)

Medic Bag, Large: Holds 8kg, and is organized for storage and quick finding of medical supplies. Wt 1kg; Price \$40 (C/C)

Medic Bag, Small: A smaller version of the above. Holds 4kg. Wt 0.3kg, Price \$25 (C/C)

QwikClot: A granular powder which is vacuum-packed for distribution, making it a small package. It comes in a sponge impregnated by QwikClot; placed on a heavily bleeding wound, it's hydrophilic qualities will almost always stop bleeding, almost immediately. Treatment with QwikClot will stop $\frac{1}{2}$ of damage due to bleeding; add a bandage and it will stop $\frac{5}{6}$ of such damage. Weight: 0.35 kg; Price:

Sunscreen: All-purpose, waterproof, non-irritating. In the US, this is normally issued liberally to troops prior to field training or wartime deployment. Wt 0.1kg, Price \$5 (S/S)

Tampon: Other than its uses in feminine hygiene, the tampon is quite useful in plugging bullet wounds. Stuck in a bullet hole, it will stop all the damage due to bleeding for 10 minutes, and $\frac{1}{2}$ the damage for 50 more. Soldiers prefer simple budget tampons in super absorbency and full size which are easy to apply and often issued by supply activities; since this property of tampons was discovered, tampons have been issued to medics as well as to females for feminine hygiene. Wt: 0.6 kg, box of 20; Price \$34

Tranq Autoinjectors: Similar to the atropine autoinjectors described in Twilight:2000 but loaded with a fast-acting tranquilizer drug, these devices were originally made for use by mental hospitals and police, but the merc and military trade soon adopted them. When applying one to an unresisting target (one surprised or subdued by unarmed combat), the user may choose the body part the injector is used on. Resisting targets must be subdued using unarmed combat before the injector can be applied.

As with tranq darts, a hit in any part of the body will be effective eventually, but some areas give faster results than others. Head hits result in instant unconsciousness. Chest and abdomen hits result in unconsciousness after 1D6~2 phases five to 15 seconds). An arm hit requires the target to roll his Constitution or less on 1D10 to stay awake each phase. The drug will take effect even if the injector is removed immediately. Tranq autoinjectors also affect dogs in the same way as tranq darts. Wt:0.1 kg per set of three. Price: \$75 per set of three (R/R)

Water Chlorinating Kit: This kit contains ampoules of calcium hypochlorate sufficient to disinfect 3000 liters of water, and a test set to determine if the water has been sufficiently disinfected. (It cannot determine if the water is clean to begin with.) The process takes 30 minutes to fully disinfect and test. This kit also contains 50 units of iodine for individual canteen disinfections. Wt 2kg; Price \$1000 (S/S)

OTHER EQUIPMENT

Fortifications

Barbed Wire, Antipersonnel: Concertina wire consisting of strips of metal with razor-like blades. This is in common use by NATO forces. It is often called "razor wire" by troops. They are often interlaced with tripwires, flares, grenades and other explosives, and cans with a small amount of metal bits or rocks in them. You can also use it to tie someone up, if you want to inflict more pain.

Barbed Wire, Concertina: Spring-like coil of barbed wire, with interlaced strands of normal barbed wire, also known as a "combat slinky." The enhancements that GIs add to the Antipersonnel Wire also apply to this wire (and any other barbed wire used by soldiers).

Barbed Wire, Concertina/Antipersonnel: Essentially a combination of the two wire barbed types above, this version of "razor wire" usually also has a horizontal razor wire strand going in and out through each coil. Just a note: I found out the hard way that barbed wire is virtually invisible at night, when I walked into a triple-concertina perimeter that I didn't know had been put up. A friend of mine had a constant disconnect between razor wire and his brain; he was constantly falling into it, and we gave him the nickname "The Ripstop Kid." Normal issue is 50 meters and no poles, usually carried on the front of APCs/IFVs and command post vehicles.

Barbed Wire (Straight): Normal lines of heavy wire with knots of barbs. Though used in warfare, they are much more likely to be used on cattle farmers' fields. Farmers normally put up strong wooden posts to attach their wire, metal poles as on the chart are normally only found on military installations, and used where cattle roam and troop training take place on the same fields.

Camouflage Netting: Modern camouflage netting is typically infrared- and radar-scattering, and impose a one level penalty on such detection attempts. Eastern-Bloc nets are normally square; NATO nets are a modular set of hexagons and diamonds. They typically are held up by a variable length of modular poles tipped by "spreaders" – five blades with wide disks on the end to, as might be thought, spread the net and raise them above the place to be hidden at the same time. Poles are composed of three sections; spreaders fold open into their five sections. Camouflage nets have a different pattern on each side (normally summer/spring and fall; other patters include winter/snow, sand/scrub, jungle, and others are certainly available). Weight and price is for an arbitrary 10x10m hexagon and two diamonds, and includes the poles and spreaders for erection. Clips are at the edges to assemble large nets. These are normally used to hide vehicles, command posts, and other high-value installations; however, many soldiers, particularly infantrymen, use them as *ad hoc* helmet cover breakups and ghillies, or to break up the outline of weapons.

Sandbag: These are generally slightly rectangular or square bags of burlap or plastic; analogues may be made out of whatever bag material is available. (The sandbag presented here is for a manufactured bag, which is generally stronger than *ad hoc* bags.) A sandbag has the sole function of soaking up bullets, shrapnel, and blast damage, and are usually deployed in walls composed of several layers of sandbags. If you have time, these sandbag fortifications can become quite elaborate.

Item	Size	Weight	Price
Barbed Wire, Antipersonnel	(Wire) 1 meter linear section; (Pole) 1.2 meters, Set of 2	(Wire) 2 kg; (Poles) 3 kg	(Wire) \$20; (Poles) \$40
Barbed Wire, Concertina	(Wire) 1 meter linear section; (Pole) 1.2 meters, Set of 2	(Wire) 2 kg; (Poles) 3 kg	(Wire) \$10; (Poles) \$40
Barbed Wire, Antipersonnel/Concertina	(Wire) 1 meter linear section; (Pole) 1.2 meters, Set of 2	(Wire) 4 kg; (Poles) 3 kg	(Wire) \$30; (Poles) \$40
Barbed Wire, Straight	(Wire) 1 meter linear section; (Pole) 1.2 meters, Set of 2	(Wire) 1 kg; (Poles) 3 kg	(Wire) \$5; (Poles) \$40
Camouflage Netting	(Netting) 10x10 meter section, hexagon and two diamonds; (Pole) 3 sections; (Spreader) 1 Spreader	(Netting) 10 kg; (Poles) 3 kg; (Spreader) 2 kg	(Netting) \$1500; (Poles) 6 kg; (Spreader) 1.5 kg
Sandbag	0.6x0.6 meter bag	0.2 kg empty, 10 kg full	\$1

Containers

Bucket: Holds 10 liters; may be plastic, wood, or metal.

Body Bag, Standard: An all-too-common necessity. These usually have a 12-mil thickness (about four times that of a standard lawn/leaf bag you buy at the store) and hold in everything 200 microns or larger. They are reasonably waterproof, but not totally. They come in a variety of colors and have 2 handles on all four sides. They come with a plastic pocket for carrying body tags; two other tags are also provided. Note that body bags are excellent protection for a variety of things, but the stigma attached to them usually prevents such use.

Body Bag, HAZMAT: These were first designed to evacuate and store those who have died of serious infectious diseases. They come in a kit of three layers, with the inner layer 200 micron/8 mil, the middle layer 200 micron/7.9 mil, and the outer layer 500 micron/20mil. The bag comes with a small heat sealer to create an airtight and snug closing on the middle layer, and the middle layer is also impregnated with special metalized plastic.

Underwater Carrier: A sealed container to transport weapons, ammunition and equipment underwater. This cylindrical container is 1.5 meters long and about 0.4 meter in diameter. It opens like a clamshell for ease of access, and contains several straps and lashing rings to secure gear inside. When sealed, the container will protect its contents from water damage. By inflating or deflating several internal flotation/ballast bladders, its buoyancy can be adjusted to enable it to float, sink, or be neutral (preferable for hauling gear long distances underwater). Pulling a lever will inflate several emergency bladders, making the loaded container capable of supporting the weight of an average person as well. The carrier has sever rings as well as straps to pull the carrier underwater (or carry over land).

The container can carry up to 50 kilograms of equipment, and when neutrally buoyant, has the same effect on a swimmer as light personal equipment. The weight given below is empty. The carrier weighs this plus the weight of any contents when out of the water..

FLEXCEL Liquid Container: This is the large rubber fuel bladder so often seen slung underneath Chinook helicopters during Gulf War footage. These bladders can be parachuted without using a pallet or any sort of padding, can survive a fall of 100 meters without a parachute, or a fall of 12 meters from an aircraft moving at 170kmh (ComMov 137). Fuel is pumped by putting a heavy weight on the bladder (normally, the vehicle receiving the fuel runs lands on or over the bladder), and the bladder can typically be emptied in 25 seconds. A FLEXCEL comes in two sizes, a large (2.6x0.36m) and a small (1x0.2m). Large FLEXCELS hold 250 liters; small ones hold 45 liters. Weight and cost include hoses and valves. These bladders may also hold water or other liquids.

Rifle/Shotgun Butt Cuff: This is a sort of canvas or leather “sock” that straps or slips over the stock of a rifle or shotgun. (They are not normally made for submachineguns, rimfire rifles, or pistol-caliber rifles since the rounds for them are so short.) The cuff may be fitted to the right side or left. The cuff carries additional ammunition for the weapon in a ready-use manner, and generally carries six rifle rounds, or for shotgun cuffs, five shotgun shells. The effect of this ready supply of ammunition is that, as long as the rounds in the cuff remain, the shooter may reload one extra round per phase.

Rubber Fuel Bladder, 50-liter: Collapsible fuel bladder. It may be drum or blivet-shaped. Fuel may be pumped by placing a heavy weight on the bladder (squashing it with a vehicle is the normal method), but it also comes with a hose and valve. These bladders can be safely airdropped from a height of 100 meters without a parachute. May also hold water or other fuels and liquids.

Rubber Fuel Bladders, NATO: This is a generic category of fuel bladders, used by many countries since they take up far less space than the usual assortment of jerry cans and 200-liter fuel drums found at other fuel dumps. These are normally shaped like a giant rubber pillow (unlike the drum-shaped FLEXCELS), and do not have the strength of a FLEXCEL; the bladder will need a pallet for a parachute drop, and can be free-dropped only 50 meters, or from aircraft moving at a maximum of 80kmh without preparation.

Many sizes are generally available. All of these bladders will collapse to 15% of their normal size when empty. Weight and cost include hoses and valves, and fuel is pumped by squashing (requiring 3 phases per liter to empty).

Rubber Fuel Bladder, Warsaw Pact/Eastern Bloc: Similar to the NATO fuel bladders above, the size of these bladders is based on metrics instead of gallons (which is the reason for the odd sizes of NATO bladders – they are made in gallons, and I have converted them to liters). They are often used to convert flatbed trucks to makeshift fuel tankers.

Item	Size	Weight	Price
Bucket	457 x 619mm	0.5 kg	\$5
Body Bag, Standard	2489 x 1219mm	0.3 kg	\$35
Body Bag, HAZMAT	Outer layer 2489 x 1219mm	0.7 kg	\$99
Underwater Carrier	1.22 m x 0.45m	6 kg	\$170
Rifle/Shotgun Butt Cuff	380mm x 152mm	0.2 kg	\$45
FLEXCEL, Small	45 liters	10.3 kg	\$225
FLEXCEL, Large	250 liters	56.7 kg	\$1250
Rubber Fuel Bladder	50 liters	30 kg	\$300
NATO Rubber Fuel Bladder	210 liters	19 kg	\$143
NATO Rubber Fuel Bladder	380 liters	34 kg	\$255
NATO Rubber Fuel Bladder	945 liters	42 kg	\$630
NATO Rubber Fuel Bladder	1890 liters	48 kg	\$1275
NATO Rubber Fuel Bladder	1950 liters	50 kg	\$1313
NATO Rubber Fuel Bladder	2840 liters	52 kg	\$1913
NATO Rubber Fuel Bladder	3785 liters	62 kg	\$2550
NATO Rubber Fuel Bladder	5670 liters	68 kg	\$3825
NATO Rubber Fuel Bladder	7570 liters	77 kg	\$5100
NATO Rubber Fuel Bladder	9460 liters	83 kg	\$6375
NATO Rubber Fuel Bladder	11355 liters	97 kg	\$7650
NATO Rubber Fuel Bladder	15140 liters	102 kg	\$10200
NATO Rubber Fuel Bladder	18295 liters	117 kg	\$12300
NATO Rubber Fuel Bladder	28380 liters	151 kg	\$18653
NATO Rubber Fuel Bladder	37850 liters	169 kg	\$24750
NATO Rubber Fuel Bladder	56775 liters	197 kg	\$37125
NATO Rubber Fuel Bladder	75710 liters	273 kg	\$49500

NATO Rubber Fuel Bladder	189300 liters	564 kg	\$123750
Eastern Bloc Rubber Fuel Bladder	4000 liters	125 kg	\$5100
Eastern Bloc Rubber Fuel Bladder	6000 liters	135 kg	\$7650
Eastern Bloc Rubber Fuel Bladder	25000 liters	290 kg	\$31875
Eastern Bloc Rubber Fuel Bladder	50000 liters	680 kg	\$63750
Eastern Bloc Rubber Fuel Bladder	150000 liters	1050 kg	\$191250
Eastern Bloc Rubber Fuel Bladder	250000 liters	1450 kg	\$318750

Tactical Lights

Chemlight: Also known as glowsticks, these are small tubes filled with chemicals which produce light when combined.. Chemlights are available in red, green, yellow, orange, and blue. A chemlight glows at maximum intensity for 3 hours (visible at 100 meters, or at the maximum range of a night vision device) and half intensity for 9 hours. (Merely putting the chemlight in a pocket will stop the light.)

Another variety of chemlight, the Brightstick, will produce very bright light for 30 minutes (visible at 250 meters, or twice maximum night-vision gear range). Brightsticks come only in white or yellow.

High-intensity chemlights are used by police and special operations, and are sometimes issued to pilots. A high-intensity chemlight produces 5 minutes of extremely bright light, the first minute of which is actively blinding. They are available only in red.

Infrared chemlights function as normal chemlights, but are visible only to individuals using night-vision gear. They glow for 6 hours. Chemlights are generally sold in boxes of 12.

Lightdiscs are simply disc-shaped chemlights. They may be written upon and are most often used as markers. They glow for 4 hours, and are available only in green. A lightdisc is 100mm wide if circular, but they also come in a variety of other shapes.

Chemlight Case: A plastic tube used to hold a chemlight. Twisting the endcap turns a shutter which blocks as much of the chemlight's glow as desired. A lightdisc will not fit in one of these. Weight: Negligible; Price: \$3 (C/S)

Krill Light: These are basically electronic versions of chemlights. They are powered by AA batteries and have LED bulbs. They come in red, green, orange, yellow, blue, and white, and come in the standard version, the Krill 180 (where the luminosity is variable), and the Extreme Krill (twice as bright as the standard Krill Light). The Krill and Krill 180 last 120 hours on a single charge, while the Extreme Krill lasts 50 hours. The standard Krill Light is slightly brighter than a chemlight.

Flashlight, "4-Battery": An adjustable flashlight often carried by police and private security guards. It also makes a very effective club. The name comes the fact that the original flashlights of this type used four D-cell batteries, though today flashlights with three or even two batteries through just as much light and almost as much use as a weapon. They are typically made of black anodized aluminum which are impact and heat-resistant, though polymer and rubber-coated bodies are also common. Most can use normal or rechargeable batteries, with a battery life of 8 hours. A very few have attachments to recharge the batteries inside the flashlight, particularly in some police departments. They typically clip to a belt by a folding D-ring at the rear, and this can also be used to hand the flashlight. Typical 4-battery flashlights have an output of 150 lumens, and an adjustable beam from a sharp, narrow, bright beam to a wide-angle, though much reduced, illumination. Typical width of illumination is the normal 45/60 degrees, though they can be focused down to 15/25 degrees and up to 85/125 degrees.

Flashlight, Cyclops Nexus HID: In a way, this may more properly called a spotlight, due to the intensity of illumination it produces. However, it produces wide-angle illumination like a flashlight, and so I have called a flashlight here. The Nexus HID (High Intensity Discharge) is a rechargeable flashlight which produces an incredible 3200 lumens of light from a new type of 25-watt HID bulb. Charging may be done using a vehicle receptacle, a wall plug (which can be plugged into other similar receptacles) or a 12V 300mA AC charger. The internal batteries are a pair of 6V lead acid batteries. An LED on the side let the user know how much charge is left – green for full battery, yellow for half battery, and red for low battery. (No LEDs light if it is dead.) Construction is of heavy polymer, capable of withstanding most abuse, dust, and dirt. The Cyclops HID throws a beam 40 degrees wide, with a secondary beam area of 80 degrees. It should be noted that this item is no longer on Cyclops's web site, though it is still available from some dealers and stores.

Flashlight, Fellhoelter Mini Bolt Light: This penlight is the result of a collaboration between Fellhoelter, FourSevens, and Tuff Writer, though it is sold exclusively through Fellhoelter. The "Mini Bolt" refers to a miniature bolt-handle-like latch on the side, which controls illumination levels of the light. Two other buttons in combination with the bolt switch control the other modes of operation. The bolt switch may remain unlocked for signal flashing, or be locked in one of its three illumination levels. The illumination levels are High (100 lumens for one hour), Medium (20 lumens for three hours) and Low (5 lumens for 20 hours). The other modes of operation are Strobe (50 lumens for two hours), SOS Flasher (20 lumens for three hours), Beacon High (Wide angle, 60 lumens for 7.5 hours), and Beacon Low (Wide angle, 2.5 lumens for 40 hours). The configuration buttons and bolt handle are deliberately somewhat difficult

to change to prevent accidental activation and setting changes. Angles of Illumination are a spot with an angle of 22/37 degrees, or a wide-angle, lower illumination flood (half-strength in lumens) with an angle of 84/121 degrees. The Mini Bolt Light uses one AAA battery, alkaline or rechargeable. Construction is largely of aircraft-quality anodized aluminum; color is charcoal gray. There is a pocket clip on the side, which is made from stainless steel. Like most penlights, the body is narrow at 13 millimeters.

Flashlight, Fenix UC35: This is a small, yet high-performance flashlight able, at its maximum brightness setting, to throw 1000 lumens. The UC35 can be powered by a single 18650 Rechargeable Li-ion battery or two non-rechargeable CR123A batteries. It can be used in six modes; Turbo mode is the brightest, producing 1000 lumens in a 30/45-degree arc, and able to run at that level for three hours. High power produces 350 lumens in the same arc for eight hours. Medium power produces 150 lumens in the same arc for 19 hours. Low power produces 50 lumens in the same arc for 56 hours. Moonlight mode produces 1 lumen for 200 hours. A special mode, Strobe mode, produces 1000-lumen signal flashes over a 180-degree arc for eight hours. The rechargeable battery is recharges via a cable that has a conventional plug on one end and a mini-USB2 connector on the other end, and the UC35 also comes with a cable with a standard USB2 connector on one end and a mini-USB2 on the other end. If a rechargeable battery is used, the UC35's battery-level indicator is functional and also gives a low-voltage warning (when down to 10% of battery power). Regardless of batteries, a digitally-regulated output mechanism maintains the same level of brightness for the entire life of the batteries.

Flashlight, Krypton: This light has an output of 120 lumens, and uses a special rechargeable lithium-ion battery that lasts only 6 hours, with a plug-in recharger. It is constructed more like a small version of a 4-Battery flashlight.

Flashlight, Military: This is a battery-powered flashlight of rugged construction, such as the US "angle" flashlight. This flashlight comes with red and blue lenses to allow for use in the dark without letting too much light out and to allow map reading and other such materiel, along with a spare bulb. Some also include green and yellow lenses. Every country seems to have a different flashlight it issues to its troops; this one is based on the US military flashlight. Military Flashlights use a sliding switch at the middle of the body; above this is a button for use when transmitting Morse Code (something, incidentally, most soldiers do not know these days, so soldiers make up their own codes). The switches have a high raised plastic guard on either side to prevent accidental switching on. Construction is of tough plastic, though I have seen them crack when dripped a long distance, like off an APC/IFV to a rocky surface or road. Nonetheless, they are of rugged construction and can take most abuse. Color varies; I have seen green (the standard issue in the US military), camouflage, gray, tan, and black, though I have heard of metallic-color plastic bodies for military use, and otherwise several colors for civilian use. Switches are normally black anodized aluminum. The joints (such as access to the battery compartment, lenses, bulbs and reflector, etc) have rubber O-rings to weather-seal them. In the base is a folding D-ring for hands-free use, and there is also a "loop" which allows it to be tied to paracord or other narrow cords. Most military flashlights use two D-cell alkaline batteries, and do not function well with rechargeable batteries, light produced is 45 lumens, with a standard angle of illumination, typical battery life is 18 hours. A diffuser lens is also available which increases the width of illumination to 100/125 degrees, but decreases intensity to 30 lumens. LED bulbs can be substituted, which increase battery life to 60 hours, increase illumination intensity to 100 lumens, but decrease illuminated angle to 30/45 degrees.

Flashlight, Military Krypton: This flashlight is in common use by special ops forces. It is very tough, and has a light intensity of 130 lumens, with the standard illumination width of 45/60 degrees. They usually have similar construction and accessories as the standard military flashlight. Battery life is only 6 hours, or 24 hours with an LED bulb; LED bulbs increase illumination intensity to 150 lumens, with an illumination angle of 30/45 degrees and a battery life to 18 hours.

Flashlight, Mini Mag-Light: Popular flashlight carried instead of the normal flashlight by many US soldiers since it is every bit as bright as the angle flashlight. The light can be focused. I carried one of these in the Army, as did many of my fellow soldiers, instead of the angle flashlight. Mini-Maglights were some of the first flashlights to use LED bulbs instead of incandescent bulbs, allowing the bulb and its power draw to be much smaller than most flashlights of the time, and this translated to a much smaller flashlight which was handier and needed only two AA batteries to function for 32 hours, though only alkaline batteries can be used. The Mini-Maglite has a brightness of 97 lumens, with a standard lighting angle on normal settings. The front can be twisted to increase angle of illumination to 75/90 degrees at a brightness of 60 lumens, or to an angle of 20/35 degrees at a brightness of 117 lumens in the primary area, or any position in between. (I can say from experience that if one twists too far towards wide illumination, the front will twist off, inadvertently exposing the bulb and causing one to fumble the reflector.) It is a compact flashlight, only 18 millimeters wide. Construction is mostly of hard-anodized aluminum, finished in one of a rainbow of colors (I generally carried a black or green one).

This entry is for a basic mini-Maglite. There are many variations and improvements.

Flashlight, Penlight: This tiny flashlight is issued to pilots and other aircrews in field medical kits (I carried one in my medical kit as a Combat Lifesaver). They are also found in NATO vehicle first-aid kits, and quite common on medical personnel pockets, even in civilian settings. It can easily be put with the end in your mouth to free up your hands for work, as they are light and short. Not especially bright, but enough for closeup work. Most have a pocket clip on the sides, and also have a lanyard ring. Older versions have a brass body and a shutter to vary the amount of light shown, but modern versions have an aluminum or stainless steel body and the end twists to adjust illumination intensity. The penlight, as the name would indicate, is about the size and shape of a higher-end writing pen. The penlight will produce a light intensity ranging from 0.4 lumens for 137 hours to 300 lumens for 51 minutes. The angle of illumination, however, is only 10/15 degrees. The lowest setting is often called "firefly mode" by troops and the penlight turns on in this mode when first switched on. The typical penlight is quite tough and can withstand repeated impacts like being dropped from two meters onto concrete floors or road surfaces. Most are also able to be submersed in water for short times without compromising them.

Flashlight, TerraLUX Lightstar 80 LED Penlight: This is about the size of a penlight, but much brighter. It is designed primarily for electrical, electronics, and engineers, since the beam is designed not to wash out color and the true color of wires and other

components can be easily seen. It is in fact designed for use by biting and holding it in the mouth, as it has a wide rubber strip[on the end for just such a purpose. It has a clip for attachment to a pocket or gear. It comes in gray, blue, orange, and white. Operation is by a pushbutton in the rear, which produces an 85-lumen beam in a tight focus of 8/12 degrees. It only runs for 5 hours on two AAA batteries, but the LED bulb lasts for 25 years. However, the inside electronics ensure that the penlight will give off the same 85 lumens until the batteries are completely exhausted. The Lightstar is O-ring-sealed, and almost totally resistant to weather, dust, and water, including immersion of up to five meters. Construction is largely of anodized aluminum.

Flashlight, Surefire P2X Fury: This is an advanced flashlight that automatically adjusts the strength of the beam to suit the area you are scanning (to a maximum of 103 meters). It can also be manually adjusted to a given luminosity desired. This saves battery life, and is called by Surefire Intellibeam Technology. The Fury is in wide use by NATO special operations personnel, and is also bought as alternate flashlights by many other military members as an alternate to the standard military angle flashlight, as well as having found acceptance by several police forces worldwide. The Fury is well-known for its dust, mud, and water resistance, and the buttons are rubberized for this purpose. There is also a quick-illumination push-button switch on the rear, which activates the Fury with medium-level illumination. The maximum illumination is 600 lumens, with a run-time of 1.5 hours at that level of use. Batteries, however, are not standard; they are rechargeable in a recharger able to recharge D-Cell batteries, but they will take three times normal to fully recharge. The Fury uses two 123A batteries, which are in most Western countries' supply chains and can also be bought at places like military surplus and outdoor outfitters. If not used, they will hold a charge for 10 years, and also last under normal circumstances for a little over 10 years before they cannot be recharged anymore. The illumination may be "dialed" down to as low as 60 lumens, with lower illumination leading to a commensurate increase in battery life. The bulbs used are variable-output white-light LEDs, though the flashlight comes with red and blue lenses. Width of light is standard, a 45-degree primary angle and a 75-degree secondary angle. A diffuser lens (not issued with military-issue flashlights). Construction is of Mil-Spec hard anodized dark gray aircraft aluminum.

Surefire's web site says that the Fury is currently back-ordered (as of September 2018) and priority for delivery goes to special operations forces, other military, and police, in that order. Batteries, however, are not standard; they are rechargeable in a recharger able to recharge D-Cell batteries, but they will take three times normal to fully recharge. The Fury uses two 123A batteries, which are in most Western countries' supply chains and can also be bought at places like military surplus and outdoor outfitters. If not used, they will hold a charge for 10 years, and also last under normal circumstances for a little over 10 years before they cannot be recharged anymore.

Lantern: Lights a 10-meter radius. Fueled by propane or butane. Fuel consumption is 1 liter per four hours.

Lantern, Coleman Quad LED: This electric lantern is powered by three AA-cell batteries per panel. It consists of a charging base, a handle on top, and a base with the batteries. On all four sides are panels with 6 LED lights; each one produces about 190 lumens. They can be detached from the base and used apart from each other, either to spread out the light or use as a flashlight or work light. Each panel has a useable light range of about 8 meters and lights in about a 45-degree arc. The panels can be adjusted for luminosity and arc of lighting. The AA-cells power the panels for about 75 hours each. The base also may be equipped with four D-cell batteries, allowing the panels to be recharged (with appropriate batteries) up to eight times.

Lantern, Electric: These lanterns run off batteries, ranging from the large rectangular "lantern batteries" to multiple D or C cells. Somewhat brighter, these will illuminate a 15-meter radius, and variable in brightness. Weight and cost are with one set of batteries.

Lantern, Pelican 3310 ELS: The ELS (Emergency Lighting Station) is designed to be a fairly bright (at short range) tactical light, with an output of 378 lumens for 190 hours (after which it will suddenly go out). It can also produce 234 lumens for 307 hours in low-intensity mode. It uses green light panels which do not spoil night vision (that much). The ELS comes in a hard clear plastic case; though the ELS will itself float, the case is also watertight and allows immersion of up to 1 meter for 30 minutes. In addition to being a standard lantern, it can also function for 434 hours in flashing signal mode. The lantern in its case may be hung in a number of field-expedient ways, or the case may use mounting hardware to secure it to a building wall. The unit uses six LED light bulbs, three on each side. The body and lenses are made from polycarbonate, and the lamp has a simple push button switch, with one push producing high mode, two pushed producing low mode, and three pushes producing the signal flashing. The lantern is powered by an internal Lithium ion battery, and a space in its base contains a recharging cord.

Lantern, Streamlight Super Siege: The Super Siege is a more modern type of lantern that runs off of a rechargeable battery for 5 hours of 1100 lumens of white light on the high setting, 10.5 hours at 550 lumens on the medium setting, and 35 hours at 125 lumens on the low setting. There is also a setting in which the lamp puts out a flashing SOS signal at 2.7 lumens for up to 230 hours, or uses red illumination at 2.7 lumens on high for up to 110 hours on high, or at 1 lumen on low setting on 288 hours. The lantern itself is made of advanced plastics, polymers, and lens material and can be immersed into up to one meter of water for five minutes or dropped repeatedly from a two meter height, without damaging it. The lantern also floats when dropped in water. The base itself is of wide rubber, and is very stable; the lantern may also be hung from a D-ring which folds into the base when not in use. The light bulbs consist of a bright white LED and a four dimmer red-light LEDs. There is a small watertight compartment in the base which can be used to store small items – it includes clips for spare LEDs, a space for the charger cord, and a space for a USB cable. The battery is internal and is rechargeable, though it can be removed by the user and replaced with a new battery. Battery indicators show what the battery capacity and charging levels are. Most buttons are recessed to prevent accidental activation. The USB cable may be used for recharging, or to recharge other items, providing some four full charges for cell phones or two for tablets, for example.

Solight LightCap 300: This is an interesting blend of water container and lantern. The lid has a circular solar panels across the top of it, which charges power for four white and one red LED. With the lid screwed on and switched on, and water in the container (two-thirds full will produce about the most amount of light), the LightCap 300 will give off about a quarter of the light of an electric

lantern, enough to light the interior of an M113 or similar-sized APC, for example. One can use the white LEDs for the most light or the red LED to save your night vision. On a full charge, the light lasts eight hours; the lid does not need to be attached to the bottle to charge the battery. A full charge takes about two hours to develop, under a sunny or lightly cloudy sky or under a decent lightbulb, or near the light of a lantern.

Item	Size	Weight	Price
Chemlight	127mm long	0.25 kg	\$26
Brightstick	127mm long	0.25 kg	\$32
High-Intensity Chemlight	127mm long	0.25 kg	\$36
IR Chemlight	127mm long	0.25 kg	\$75
Lightdisc	100mm wide	0.5 kg	\$30
Chemlight Case	132mm long	0	\$3
Krill Light	127mm long	0.1 kg	\$12
Krill 180	127mm long	0.1 kg	\$14
Extreme Krill	127mm long	0.1 kg	\$18
Flashlight, "4 Battery"	328mm long	1.05 kg	\$40
Flashlight, Fellhoelter Mini Bolt Light	127mm long	0.03 kg	\$55
Flashlight, Fenix UC35	150mm long	0.13 kg	\$45
Flashlight, Krypton	328mm long	0.94 kg	\$120
Flashlight, Military	216mm long	0.3 kg	\$12
Flashlight, Military Krypton	216mm long	0.3 kg	\$48
Flashlight, Mini-Maglite	168mm long	0.12 kg	\$24
Flashlight, Penlight	133mm long	0.02 kg	\$30
Flashlight, Surefire P2X Fury	137mm long	0.15 kg	\$75
Flashlight, TerraLUX	140mm long	0.06 kg	\$19
Lightstar 80 Penlight			
Lantern	610mm tall	2 kg	\$25
Lantern, Coleman Quad LED	610mm tall	3 kg	\$80
Lantern, Electric	610mm tall	2.2 kg	\$40
Lantern, Pelican ELS	259mm tall	0.36 kg	\$42
Lantern, Streamlight Super Siege	191mm tall	0.85 kg	\$105
Solight LightCap 300	215mm x 102mm	1 kg (full)	\$30

Tactical Smoke Generators

Tactical Smoke Generator: This is a device to produce a massive volume of thick smoke that is opaque to certain optical frequencies. There are several types available, based on when they are made:

Pre-1970s: The smoke blocks vision and image intensification.

1970-1980: The smoke blocks vision, image intensification, and lasers.

1981-1985: The smoke blocks vision, image intensification, infrared, and lasers.

1986-1993: The smoke blocks vision, image intensification, infrared, thermal imaging, and lasers.

1994-2000: The smoke blocks vision, image intensification, infrared, millimetric imaging (such as the guidance of fire and forget missiles), and lasers.

When vision is blocked, all tasks related to the vision or aiming (if lasers or millimetric waves are blocked) become three levels more difficult.

A tactical smoke generator weighs 1.2 tons, and may be transported in any vehicle or trailer capable of supporting its weight. The smoke generator produces a cloud equal to three smoke grenades in volume every phase, and typically runs for 90 minutes on a tank of fuel (about 650 liters, 7.2 liters per minute). It is basically a pulse jet engine that injects special oil into its exhaust to produce the smoke. The fog oil also lasts for 90 minutes on a tank (about 450 liters, 5 liters per minute). The jet engine runs on almost any type of military fuel except alcohol, including diesel, jet fuel, gasoline, AvGas, etc.

Fog oil is not acceptable for use as motor oil or transmission fluid without refining.

Certain armored vehicles can lay a smokescreen by injecting diesel fuel into their exhaust. Such smoke screens are equivalent to tactical smoke generators from the period 1970-1980, but are only the equivalent to two smoke grenades per phase of generation. Such smoke screens cost the generating vehicle one liter of fuel per phase of laying.

Conventional smoke grenades are also equivalent to 1970-1980 tactical smoke generators. More advanced smoke grenades exist; these cost quadruple for 1981-1985 equivalent, and 8 times normal cost for 1986-1995 equivalent.

Item	Size	Weight	Price
Pre-1970s Smoke Generator	2 x 1.2m	1.2 tons	\$2000
1970-1980 Smoke Generator	2 x 1.2m	1.2 tons	\$2500
1981-1985 Smoke Generator	2 x 1.2m	1.2 tons	\$3000
1986-1993 Smoke Generator	2 x 1.2m	1.2 tons	\$4000
1994-2000 Smoke Generator	2 x 1.2m	1.2 tons	\$5000
Pre-1970s Fog Oil	1 liter	1 kg	\$15
1970-1980 Fog Oil	1 liter	1 kg	\$20
1981-1985 Fog Oil	1 liter	1 kg	\$25
1986-1993 Fog Oil	1 liter	1 kg	\$35
1994-2000 Fog Oil	1 liter	1 kg	\$45

Miscellaneous

Bullhorn: Also called a megaphone, this makes a human voice distinctly audible at 600 meters and indistinctly audible at 1000 meters. Powered from external batteries or by a vehicle. May be operated using a microphone or by speaking directly in the rear end. Requires 15w to operate.

Bungee Cord: 1 meter long (stretches to 2 meters). Made of highly stretchable tightly interwoven high-strength rubber and bits of cloth. These are in common use by soldiers to attach gear and build shelters; very long, very high-spec ones are in use by bungee jumpers. Normal ones have high-strength hooks on the ends, woven into the bungee cord material. Weight: (per 4) 0.17kg; Price: (per 4) \$8 (C/C)

Cigar: Average quality, per 10. More quality cigars will cost more (up to 20 times or more the base price). Cuban cigars in Europe will be very rare, while European cigars will cost much more in the US, etc. Weight: 0.11kg; Price: \$50 (R/R)

Cigarettes: Any brand, per carton of 240. As with cigars, more quality will dictate a higher price (quality can be crap, too, fetching a lower price).

Cigarette Lighter: Total 500 seconds of flame (approximately 250 lights). This is for a permanent, Zippo-type lighter. Most require butane or propane, but some can be fueled by motor fuels or alcohol. They also require changes of flint periodically. (Tinkering might help.) Lighters can be found in the pockets of most soldiers, even those who don't smoke, as they are a useful tool.

Disposable lighters may also be available; these are cheap, and give about 250 seconds of lighting time. They cannot be used to provide long-term lighting, as the bulk of the lighter is plastic, even the working parts, and the bracket for the thumbwheel will melt in about 20 seconds of lighting, making the lighter useless from those points.

Compass, Lensatic: Reads in degrees or mils, and is luminous for night use.

Cord: Such as "550 Cord" parachute line. Per 15 meters. Weight: 0.1kg; Price: \$3 (V/V)

Field Washstand: This is a small washstand for field use, able to be used by four people at once. The faucets are pumped manually using a foot pump, and the stand has a paper towel holder and soap dispenser. The stand is fed by an 83-liter water tank and a 10-liter soap tank, and has another tank for capture of wastewater.

Dictionary, Language: An extensive translation of one language to another, including idiomatic phrases. Unfortunately, it takes some time to use in a conversation. (And sometimes, they're just flat wrong.)

Dictionary, "Pointee-Talkee": Small booklet consisting of basic phrases on one and the equivalent phrase in two other languages on the opposite page. The use points to the desired phrase and asks the other person to point to his reply (the instructions are the first set of phrases). Phrases are simple ("Where is food?" "Does anyone speak English" "Glad to meet you", etc.) and contain phrases in the following subjects: finding an interpreter, courtesy phrases, food and drink, comfort and lodging, communications, injury, hostile forces, and friendly forces. There are approximately 5-20 phrases per subject (as necessary). These dictionaries are normally issued to aircrews.

Drum, Storage: Normal steel or aluminum drum, though plastic is becoming available. Normally used for shipping or storage, they can be used for smuggling if the interior is modified or set up right. (Cut in half and with a few modifications, you can also make a barbecue out of them.)

Fishing Line: Includes a hook and a lead sinker.

Fishing Net: This net is weighted with eight removable weights, and also has four removable plastic or glass bobbers. They are normally round. They have many more uses than simply fishing.

Fishing Pole: This is an average-quality rod-and-reel, with a weight and hook. Special lures do not come with this pole, and it is not for fly fishing.

Folding Stove: Pioneered by the British SAS, this is a stove with a bottom just large enough for storing a pack of eight fuel tabs and is designed to use them, It is more commonly called a tommy cooker or a blackie, and was first issued to British troops in the First World War. It is still in common use in most of the world's armies. The stove opens into two blades that are used to hold the canteen cup, and therefore boils water and cooks rations and fresh food.

Fuel Tabs: Generally made of Hexamine, these are generally issued in foil packages of eight that break apart. They have been issued since the First World War for use with the tommy cooker. One will heat a canteen cup of water to boiling in 5 minutes. They float, and are water resistant; they will even burn while floating down a stream. They can be extinguished by dousing it with water or

covering with dirt or sand, which does not waste the tablet and it can be used again.

Grapple: This is a multiple-pronged hook to be used at the end of a length of rope to assist in climbing walls, etc. It can be thrown as any other object, but counts as two kilograms instead as one (because of the rope also attached). Some models are designed to fold, collapse, or otherwise dismantle for ease of transport.

Handcuffs: Used to restraining appendages. There are two types—metal and plastic. Metal cuffs are reusable and open with a key, while the plastic cuffs are disposable and must be cut off. (They are typically called zip ties.) Zip ties have the virtue of being usable for a wide variety of things. Applying handcuffs counts as an action and takes five seconds.

Jumar Ascender: This is a special climbing rig consisting of a pair of foot loops attached to clamps, which lock on a hanging rope when downward pressure is applied. The climber uses the Jumar Ascender to literally walk up the rope, almost as efficiently as climbing a ladder, at a speed of 2 1/2 meters per phase. This may be doubled (AVG: Climbing or DIF: Agility) or tripled (DIF: Climbing or FOR: Agility).

Note that a field-expedient version can be made of shoestrings or certain types of cord; this is a DIF: Climbing task, and two rolls must be made (the first only once in the PCs career) – the player must roll once to see if his PC knows how to do it, and then to actually do it. Making a Jumar Ascender takes 5 minutes. Hooking up a ready-made Jumar Ascender takes only two minutes. Base rate of climb with an *ad hoc* Jumar Ascender is only 2 meters.

Lock, Average: Key or combination. Key-opened locks usually come with two keys.

Lock, Quality: Key or combination. Key-opened locks usually come with two keys. Will withstand most blows and gunshots (gunshots and very heavy blows will ruin the lock, but it will not open.)

Maturing Theatre Latrine (MTL): This is a very fancy name for a Porto-potty made to military specifications. It is the normal sort of outdoor toilet common at open-air events and construction sites throughout the US and other countries, but in addition to the wastes being carted away or disposed of in sewers systems or other ways, the bowl for the wastes can be removed from the toilet, flammable liquid placed within, and the wastes burned. Though popular at command posts of higher echelons, they were generally considered too big for elements of maneuver units and even if issued to them, they were generally discarded or traded to rear elements for more desirable items.

Modular Initial Deployment Latrine (MIDL): Somewhat more robust than the personal commode, this is used to service units up to platoon size in the first stages of deployment or when the unit will not be long in one place. It consists of a collapsible fiberglass or plastic commode with hangers for a plastic bag below the opening. Wastes are deposited into the bag, and then the bag is sealed and burned or buried. A frame for supporting a privacy screen is provided with the MIDL. Enough bags are provided with the kit for 25 soldiers for 30 days, assuming normal bowel functions during that time. Alternatively, it can be placed over a slit trench and wastes buried as you go as the MITL is moved over the trench.

Paint: Any color, one liter. Comes with two paintbrushes of average size.

Rope: This is milspec 11mm rappelling line. Generally a nylon or hemp rope.

Skyhook (Ground Unit): A specialized ground/air pickup rig for extraction by aircraft when ground conditions do not permit a landing, which was originally designed for military and civilian air/sea rescue units. The ground unit consists of a personnel harness (very similar to a parachute harness), a coil of cable, and an inflatable helium balloon large enough to carry the cable several hundred feet into the air. The unit can be used for either personnel or cargo. Skyhook requires a specially modified multiengine aircraft, usually provided by patron (few merc groups can afford to maintain them).

Skyhook aircraft will be detailed elsewhere and elsewhere due to space constraints.

Using Skyhook: The passenger dons the harness, inflates the balloon (upon arrival of the pickup aircraft), and prepares himself for the shock of pickup. A specially modified cargo aircraft snares the balloon/cable with a specially fitted V-shaped "blimp-catcher" on its nose, and reels in the passenger until the passenger is close enough to a specially installed cargo door on the bottom of the aircraft. The aircrew snares the passenger/cargo, hauls him/it aboard the plane, and prepares for another pickup if necessary.

The shock involved is no more severe than an opening parachute, provided that the pickup aircraft does not fly too fast. The process is dangerous, but no more so than a parachute jump if done properly.

The pickup plane must fly straight and level a few hundred feet off the ground. The whole operation needs suitable terrain (no nearby obstructions) and reasonable privacy. The blimp can be equipped with IR/white light strobes (activated at the last moment) for a night pickup. The weather must be reasonably clear, with no excessive wind conditions. Skyhook can also be used at sea. A skyhook ground unit may not be reused.

Small Unit Shower (SUS): This is a hollow collapsible metal frame with rubberized fabric walls to provide four shower stalls. The shower units are similar to those aboard naval vessels, with push button controls that spray only when the button is pushed. Hot water is provided by a 75-liter water heater that can provide 16 showers to soldiers before the tank is exhausted. The tank requires 50 minutes to fully heat the water, and is powered by diesel or aviation fuel (30 liters per period), an external generator (45kW), or vehicle power. The unit packs into two canvas bags. It may be set by two soldiers in 15 minutes.

Solar Radio: This is for all intents and purposes a civilian radio; it is able to receive FM and AM commercial radio broadcasts, as well as National Weather Service broadcasts or their equivalent (if available). It operates with dials, and up to seven presets may be set and accessed with a separate dial. Tuning is done with a dial, with the frequencies read on a linear scale. The Solar Radio may be powered by conventional batteries (usually three AA cells), but what gives the radio its name is the solar panel on the back that can charge a set of lithium-ion batteries inside. If left in the sun turned off, it will run for as many hours as it was left to charge, up to a maximum of 16 hours. (If left on, it will run off the solar power, but not charge up the Li battery.) An external battery pack can also be plugged into the radio to run it. It can be plugged into electrical power, if available. Finally, if it is dark or the day too cloudy or

otherwise dark, a hand crank may be unfolded on the side or rear (depending on the radio) to crank a dynamo; 90 seconds of hard turning will run the radio for 45 minutes. Power source is selected by a switch. And just to top the whole thing off, there is a small flashlight in the handle.

UV Water Purifier: Shaped like a pen-type thermometer, the UV Water Purifier is dropped into a canteen cup or other container and purifies the water. Sunlight is a requirement of the use of this, the brighter, the better. (Flashlights of suchlike cannot be used as a substitute.) It can only be used once, and cannot be used in boiling water. Purification takes 48 seconds, and it will filter harmful organisms, minerals, and chemicals.

Vehicle Low-Altitude Extraction Kit (LAPES System): This consists of a drogue parachute and a shock-absorbing pallet strapped to the bottom of the vehicle. The aircraft must have a rear cargo ramp to utilize this kit. The aircraft flies at extremely low altitude (three to five meters) at minimum speed and deploys the drogue chute out the back. The drogue chute opens; the vehicle is yanked out of the aircraft; and the pallet absorbs most of the shock of landing. Vehicles larger than 25 tons cannot be dropped in this fashion.

Crew may not ride in the vehicle while this goes on. It requires 10 minutes to make a vehicle or equipment operational after landing.

Spray Paint: Any color. Try not to get high.

Vehicle Parachute Kit: This consists several parachutes (depending on the weight of the vehicle to be dropped), a retrorocket assembly, and a shock-absorbing pallet strapped to the bottom of the vehicle. After the vehicle is dropped from the aircraft and the chute deployed, a contact sensor on a cord drops three meters below the vehicle and the retrorocket package deploys below the vehicle. When the sensor touches ground, the retrorocket package fires and slows the vehicle's descent even further. Vehicles larger than 15 tons cannot be dropped in this fashion.

Crew may not ride in the vehicle while this goes on. It requires 10 minutes to make vehicle operational after landing: disconnecting the chute and the pallet, freeing everything that had to be tied down for air transport, screwing down everything that was jarred loose during the landing, and—last but not least—a quick inspection, which is not something to have to do in a hot DZ. The Russians are well known for this version of deploying vehicles and equipment, and the vehicle's driver and commander ride inside the vehicle during the drop.

Water Desalination Unit: This unit is capable of desalinating 300-700 liters per hour, depending on the raw salt content of the water. No chemicals are needed for the operation of the unit (a permanent filter unit does the work), though a tank is provided to add chlorine, if desired. The unit requires that an external 1.5 kW generator be hooked up during operation. A disinfecting unit is also provided, but other pollutants such as fallout, sand, and mud cannot be removed by this device. Water can be siphoned from containers, or directly from a natural water source.

Water Purification Unit, Medium: This is a machine carried in a backpack. It eliminates organic, mineral, and bacterial pollutants by using a set of mechanical filters. Filters last for 1,200 liters. Water is purified at the rate of 200 liters per hour. The unit runs from internal batteries and can purify up to 7 liters of water from internal tanks while being carried, or siphon water from containers or directly from a natural water source such as a pond, lake, or stream. It is not capable of desalinating water.

Water Purification Kit, Small: A small machine designed to draw water through a system of filters, purifying the water of most contaminants. Purifies 0.75 liters per minute, and runs on hand power. It is not capable of desalinating water. Filters last for 50 liters.

Item	Size	Weight	Price
Bullhorn	620mm long, (Battery Pack) 229mm square	3 kg	\$40
Bungee Cord	1 meter section, 10mm wide	0.04 kg	\$2
Cigars	Per 10, approx 305 x 229 x 52mm	0.4 kg	\$50
Cigarettes	Per carton of 240, 610 x 76 x 62mm	0.5 kg	\$72
Cigarette Lighter	52 x 38 x 7mm	0	\$40
Disposable Lighter	7 x 20 x 41mm	0	\$30
Compass, Lensatic	51 x 51mm	0.2 kg	\$30
Cord	15 meters long	0.1 kg	\$3
Field Washstand	1219 x 915 mm	27.22 kg (w/o water)	\$460
Dictionary, Language	Variable	0.5-2 kg	\$40
Dictionary, "Pointee-Talkee"	100x100mm	0.1 kg	\$100
Drum, Storage	200 liters	10 kg	\$30
Fishing Line	20 meters	0.2 kg	\$5
Fishing Net	1x1 meters	1.8 kg (double with full set of weights)	\$57
Fishing Pole	1 meter	4 kg	\$50
Folding Stove	115 x 64mm	1.1 kg (with package of 8 Hexamine)	\$40

Fuel Tabs	76 x 76mm	0.4 kg (Package of 8)	\$16
Grapple	458x458mm	1 kg	\$60
Handcuffs	75x75mm/0.5 meters long	0.2 kg/0.001 kg	\$20/\$2
Jumar Ascender	2x1 meter	0	\$100
Lock, Average	40x15mm	0.1 kg	\$10
Lock, Quality	40x15mm	0.1 kg	\$30
MTL	2m x 0.75m	50 kg	\$600
MITL	1m x 0.75m	8 kg	\$180
Paint	1 liter	1 kg	\$20
Rope	50m x 11mm	5 kg	\$100
Skyhook	1372mm x 914mm (in case)	36 kg	\$1600
Solar Radio	18.4cm x 14cm x 5 cm	0.45 kg	\$50
SUS	2m x 4m	68 kg	\$550
LAPES Rig	Variable, Depending upon Cargo	1.5 tons	\$16,000
Spray Paint	800 ml	1 kg	\$20
UV Water Purifier	400mm	0.1 kg	\$200
Vehicle Parachute Kit	Variable, Depending upon Cargo	1 ton	\$12,000
Water Desalination Unit	2.27m x 0.33m	175 kg	\$5200
Water Purification Unit, Medium	1m x 0.33m	(Unit) 18 kg; (Filter) 5 kg	(Unit) \$1500; (Filter) \$300
Water Purification Unit, Small	0.33m x 0.33m	1.5 kg	\$340

NOISE SUPPRESSERS AND FLASH SUPPRESSERS

The use of a noise suppressers degrades the performance of a weapon. Weapons fitted with noise suppressers have their armor penetration degraded by one category (1-Nil becomes 2-Nil, 1-2-Nil becomes 2-3-Nil, etc.). The noise suppresser reduces the range of the weapon by 5m (for a pistol, revolver, or submachinegun) or 10m (for any other sort of weapon). Some weapons are specially designed to take silencers and may break these rules. Fitting a suppresser to a weapon not already prepared for one is a task (DIF:Gunsmith). Adding a suppresser to a weapon threaded for one requires no special skill.

Flash Suppresser, Pistol: Prevents a bright muzzle flash by venting explosive gasses. This suppresser is suitable for pistols (but not machine pistols). Attempting to spot a character using causes their Observation skill to be degraded by -3 during the day and one full place at night. Suppressers cannot be made which will eliminate the flash of Magnum ammunition. Wt 0.1 kg; Price \$65 (R/R)

Flash Suppresser, Rifle: Suitable for use with sporting rifles, sniping rifles and semiautomatic battle rifles. It gives the same benefits to rifles as pistol flash suppressers. Wt 0.2 kg; Price \$75 (R/R)

Noise Suppresser, Automatic Weapon: Suitable for use with assault rifles, machine pistols, automatic battle rifles, and submachineguns. There are no noise suppressers for use with automatic rifles and machineguns. The character attempting to spot someone using this suppresser gets a -4 Observation at short and medium range and -3 Observation as long and extreme range. Wt 0.5kg, Price \$200 (R/R)

Noise Suppresser, Automatic Shotgun: Suitable for use with shotguns such as the HK CAW, SPAS-12, and Assault 12. It may also be used with the 25mm version of the MM-1, if used with 12-Gauge ammunition. (Using this suppresser on the MM-1 with grenade ammunition is 50% likely per shot of destroying the noise suppresser!) Attempting to spot a character using this suppresser causes a -2 Observation at short and medium range, and -3 Observation at long and extreme range. Wt 0.6kg, Price \$300 (R/R)

Noise Suppresser, Pistol: Suitable for use with pistols. This device will do nothing to silence a revolver. This device cannot be used with machine pistols (such as the Stechkin or Micro-Uzi); an automatic weapon noise suppresser is required for these weapons. The character attempting to spot someone using a pistol with a noise suppresser is degraded by one place. Wt 0.25kg; Cost \$135 (R/R)

Noise Suppresser, Rifle: Suitable for use with sporting rifles, sniper rifles, and battle rifles. (Automatic battle rifles require the automatic weapon noise suppresser.) Attempting to spot a character using this device is degraded by one place. Wt 0.5kg; Price \$225 (R/R)

Noise Suppresser, Shotgun: Suitable for use with pump or semi-automatic shotguns. Attempting to spot the character using this suppresser gets -2 observation at short and medium range and -3 observation at medium and short range. Wt 0.6kg, Price \$275 (R/R)

Noise/Flash Suppresser, Pistol: Combines the effects of noise and flash suppressers (all effects are cumulative). Suitable for use with pistols (but not machine pistols). The flash-suppressing aspect will not work with Magnum ammunition. Wt 0.25 kg; Price \$400 (R/R)

Noise /Flash Suppresser, Revolver: Silencers for revolvers are huge, bulky affairs and must be hand-made for each weapon. They shroud the barrel and cover the revolver cylinders, requiring an extra step (removing the cylinder cover) to reload. (Add two extra rounds to reload a silenced revolver.) These weapons are extremely rare and were produced mainly as curiosities. Attempting to spot a character using one of these weapons is DIF: Observation. Wt 1.5kg; Price \$1000 (-/-)

Noise/Flash Suppresser, Rifle: Suitable for use with sporting rifles, sniper rifles, and semiautomatic battle rifles, combining the benefits of noise and flash suppression. Wt 0.5kg; Price \$600 (R/R)

PERSONAL GEAR

Clothing

Air Mattress: This is generally issued instead of the military sleeping pad to airborne, air assault, and special operations troops, as it can be scrunched into a much smaller folded space. It is made of a vinyl base interior, surrounded by rubberized plastic (or sometimes plastic or tarp material). It can be inflated by one man in about 10 minutes (assuming normal lung power), and is slit into several lengthwise cells and a large cell at the top which functions as a pillow, and a small tube at the bottom for structural integrity purposes. In theory, military air mattresses are puncture, slash, tear, and cut resistant; in practice, this happens all the time. Unrolled and inflated, a military air mattress is 185x55x6.5 centimeters; properly folded, it comes to a small package 120x30x4.5 centimeters. However, as with the military sleeping pad, most light infantry (including Rangers, Airborne, and Air Assault), the air mattress is generally left behind in the field trains, accompanying truck, or bivouac area inside the tent.

Animal Skin (Large): A large animal skin draped around you. If such a skin is not dressed right, the protection it may afford will become a liability, as blood and tissue may freeze or turn. Dressed properly, and with the right donor animal, it can provide considerable warmth and even some protection against inclement weather.

Animal Skin Clothing: Essentially animal skin that has been tailored into clothing, making it more form-fitting. This not only makes moving about in it easier, it makes the wearer quieter and increases the amount of cold or inclement weather it can hold at bay. Again, it must be dressed properly; perhaps even more dressing and perhaps tanning, are necessary for Animal Skin Clothing. Such suits can cost more, depending upon the tailor skill; below should be considered a base cost. It also includes a hat or hood.

Blanket, Civilian: Warming when dry, virtually useless when wet, as it does not dry easily. This may be made of quilted fabric and filler, wool, linen, or any number of fabrics. They get wet fast, so don't use them as outerwear. And then they lose all their warming properties. They can be light or heavy.

Blanket, Fur-Lined: A simple square or rectangle of fur-lined blanket material, usually bonded with lacings. It can be used as a ground sheet, or as a wrap. If you use a civilian blanket as a base, read the notes about civilian blankets.

Blanket, Military: This one of those itchy but surprisingly warm (but not as warm as a poncho liner pound for pound), made of woven wool, but perhaps not in the best way. Water protection is virtually nil, but there is warmth. Their itchiness is really overblown.

Camouflage Smock: A simple poncho-like smock to provide a makeshift camouflage pattern. This has an advantage, as it can allow the user to change between camouflage patterns quickly without changing uniforms; the Nazi forces used them quite effectively in World War 2. It provides almost no protection against weather, as that is not its forte. In T2K notes: this may be the primary camouflage garment issued after TDM, as it is easier to make in rear areas.

Civilian Winter Coat: Worn over fatigues, assuming it fits over them. Protects against 30°.

Cold-Weather Gear: This set of clothing is designed to supplement the basic clothing issue for troops that must operate in cold weather. It consists of a hood for the field jacket (issued with fatigues), wool undershirt, insulated canteen covers (to keep your water from freezing outright – it's still cold enough to give you a jolt), wool underwear (not quite as protecting as milspec long underwear), a sweater, a scarf, a pile cap, a pair of wool gloves with outserts (the gloves can be worn without the outserts, and they will protect against 8 degrees, but they get wet in a hurry and do not dry quickly), liners for the field jacket/fatigues (light and heavy liners) and a pair of insulated boots ("Mickey Mouse Boots"). Various pieces of this setup are worn depending on the individual's taste and the temperature. The weather protection of cold weather gear is primarily in the gear it is worn with. Some items are available alone, and use the stats for those items already listed. The gear is usually issued in camouflage pattern or OD green/OD brown/black, but can sometimes be had in white. This kit will save your life or stop you from getting frostbite, but can be uncomfortable or downright clumsy if active or worn for a long period of time. (This is particularly true of the gloves with outserts.)

Cold Weather Gear, Extreme: This is intended to supplement the cold-weather gear, instead of being standalone issue. It consists of a parka, insulating liners for the field jacket, trousers, and poncho, and a pair of mittens and insulating inserts. Only under the coldest conditions will everything be worn. This gear is usually issued in camouflage pattern or OD green, but sometimes can be had in white.

Fatigue Uniform: Part of Basic Issue. The standard fatigue uniform will protect to a certain level; beyond that, you need cold-weather gear, cold weather inserts, or a field jacket, again with or without inserts. This is for the worn uniform; extra carried uniforms

and boots require load carried by the carrying personnel. The fatigue uniform includes boots, 4 pair socks, and a field jacket (without inserts). Other countries have similar issue, though the camouflage pattern will be one of the nation in question patterns. Some nations have more than one pattern; the pattern worn will be the one applicable to the area of the world they are being deployed.

Field Jacket: Essentially a heavier version of the Fatigues' shirt, the Field Jacket is made of several layers of fabric and in some cases is weatherized.

Field Pillow: This is essentially a small inflatable bladder which may be inflated by lung power in about a minute. It is usually divided into 2-4 cells for additional strength. It is made of the same material as the Air Mattress above. It folds down to a small package of 11x6x2.5 centimeters; it opens and inflates into 38x28x10 centimeters. If issued at all (most CIF Facilities do not issue them, and if you want one, you'll have to go out in town and buy one yourself), these are another one of those items that is often left behind, though not as much as the air mattress; sometimes a few creature comforts are nice to have.

The Light Liner comes with the fatigues and field jacket which fits into the torso buttons inside, over the shoulders, and under the underarm. The fabric is quilted, and is similar to the poncho liner in construction (though not in form).

The Heavy Liner is for the most part made of heavier quilted material. The underarm openings are somewhat more closed, and the Heavy Liner has sleeves which extend under the sleeved portion of the field jacket. (A common use by US and South Korean troops is to wear the liners under the fatigue shirt.)

Gloves, Light: Light leather, synthetic, or wool gloves.

Gloves, Ski: Heavy gloves made of materials such as Gore-Tex. May affect tasks requiring manual dexterity.

Gore-Tex ECWS (Extreme Cold-Weather System): This is the most modern of cold-weather survival, issued to various countries' on a need-to-have basis. Civilian mountain climbers and arctic explorers will also have such gear. The ECWS consists of Gore-Tex equivalents of the items in the cold-weather and extreme-cold weather gear, but this gear is much more durable, is waterproof, and more resistant to cold than ordinary gear. ECWS is much sought-after by troops who don't have it, and as a result items of the ECWS can be found worn by just about anyone. It can be bought in town, in surplus stores, and in towns downrange who deal in soldier needs. This gear is usually issued in a camouflage pattern, but civilian versions are usually in bright colors (such as orange or blue), and it can be had in white.

Long Underwear: This may be made of lycra, cotton, wool, Gore-Tex, or a variety of materials. It usually consists of a short and underwear, including long sleeves and long leg sleeves. It does provide considerable warmth, but is often not issued to non-combat-arms troops, who often buy their own long underwear.

Mosquito Net: 2 1/2x2 1/2 meters. Also known as an Insect Bar, this is just large enough to shield one pup tent, or to make rude shelters from. They work surprisingly well, but are not often carried by troops due to weight and encumbrance.

Notebook, Combat: This is a generic term for a special notebook that is canvas-covered, sometimes zippered shut, and opened, and with 25-50 pages. The binder and pages are waterproof and designed to be written upon with a pencil, for which a pocket is provided (along with one for a small pencil sharpener). The binder is tough enough to be dragged over common battlefield debris and other rough terrain. One can literally take notes in a downpour, with the pages able to take notes even when wet and designed to take pencil notes even in a downpour. The notebooks in most cases are kept closed with a large canvas-and-elastic band; some however, use a zipper. A pencil and sharpener are included. A Typical Combat Notebook is about 9x15 centimeters.

Overwhites: a thin, primarily white with a camouflage pattern (primarily black/gray splotches). It does not really have any weather protection, and may be a simple smock in some countries instead of an overwhite suit.

Poncho: A near-square piece of rubberized or plasticized fabric (or perhaps no fabric at all). It has a head hole and hood in the center, and snaps to make it fit better around the arms. Mainly keeps you (semi-) dry, but does have some temperature protection. (As a matter of fact, if the rain stops, it can get downright hot in a poncho.)

Poncho/Shelter Half: This is a more windproof, waterproof shelter half, most famous for being standard issue in the Austrian Army. It also comes with poles and pegs, sufficient for half a pup tent. With two such shelter halves, the pup tent is more dry and snug, and used as a poncho, the soldier is more dry and snug in inclement weather.

Poncho Liner: A light quilted blanket. It is surprising how warm a poncho liner is. When wet, you can wrap yourself in it, and still get warm, because it dries from the inside out. It's not called a poncho liner because you line your poncho with it when using the poncho as rain gear; it called a poncho liner because you can wrap up inside the poncho liner and poncho and make an improvised

sleeping bag. It quickly becomes one of an infantryman's most treasured items.

Poncho/Sleeping Bag: Widely issued to German troops, and issued in small quantities to US troops. Also known as the IMPS (Individual Multi-Purpose Shelter). As it sounds, this is an insulated poncho that can be unfolded and closed off to form a sleeping bag. Small stays keep the other end off the wearer's head and chest if desired. It folds into the hood for carrying. Weight: 1.4kg; Price: \$200 (C/R)

Rainsuit: This is essentially outerwear that is rain-resistant. It is preferred by many soldiers who like the increased flexibility and quieter travel when in one. Like the poncho, it can get quite hot when worn in non-inclement weather. It is for the most part rain gear, but like the poncho has some small value in keeping you a little warm.

Standard Sleeping Bag: This is a standard sort of sleeping bag, like the TA-50 medium bag or any number of civilian or military non-heavy-duty sleeping bags. This bag, or one like it, is issued with MOLLE or TA-50 Gear, and most military units who operate in temperate climates.

Snowsuit: Designed for maximum clothing protection against the elements. They are usually white, but may also be olive drab (as they are in Korea issue), BDU pattern (probably by now that awful ACU pattern), and several others depending upon the origin of the suit. They are made to accommodate the fatigue uniform, perhaps with a field jacket. They are designed for winter attack, possibly on skis or snowshoes. Further camouflage is given when wearing the oversuit.

Sleeping Bag Bivy Cover, MSB: This is a waterproof, windproof bag designed to be used with the MSB or by itself. It incorporates the same material that is used in the Extended Cold-Weather System. It comes with a breakaway zipper that can completely enclose the occupant and be egressed quickly.

Sleeping Bag, Modular (MSB): This is a two-bag system consisting of a lightweight outer patrol bag (temperature rated to 30°F) and an intermediate inner bag (temperature rated to -10°F). The bags can be used independently or mated together to form the extreme cold weather bag rated to -30°F. The MSB incorporates the latest sleeping bag technology using lightweight polyester fibers for insulation. It is hydrophobic (water hating) and light, weighing less than 7 pounds. It comes with a compression sack for easy stowage.

Sleeping Pad, Civilian: Much more comfortable than a military sleeping pad, a civilian sleeping pad is composed of several individual pockets of thick foam rubber or cotton or memory foam which conforms quickly to the contours of the sleeper's body. It has "side rails" that usually keep the sleeper centered on the pad, so he doesn't roll off as often. The civilian sleeping pad comes with a patch kit, with the patches being pressure-sensitive or ironed on. The civilian sleeping pad is generally puncture and tear-resistant, rolls into a smaller space of 50x50 centimeters. Rolled out, it generally has dimensions of 185x60x6.5 centimeters. (Longer and shorter pads can also be had, for an appropriate increase or decrease in size, weight, and price.) The civilian sleeping pad stores in a compression bivvy sack which reduces the rolled-up space to 35x35 centimeters.

Sleeping Pad, Military: Many countries' militaries issue their troops sleeping pads to smooth out lying on the hard and often rocky ground. One puts their sleeping bag, blankets, or poncho liners on top of the pad and cover themselves up. When not used, they roll up into a smaller space and are usually strapped to a rucksack when carried. (I say *when carried*, because smart and reasonably acclimated troops do without them except when in a semipermanent encampment, as even when rolled up, they are quite encumbering). The pads are made of dense foam rubber that keeps out most water and mud, but heavy rain or suchlike will soak into pad, turning it into a large, soggy sponge. They roll up into a space of 76 centimeters wide and 25 centimeters thick, and roll out to a size of 185x76 centimeters (therefore, tall soldiers will find their feet or heads projecting beyond the pad). Colors among countries that use them include gray, OD Green, OD Brown, black, and sometimes other colors. They do roll up, but trying to get them to sit flat when unrolled can be difficult. They tie rolled with one, two, or three straps, cords, or ropes; these are normally sewn to the pad. It should be noted that most soldiers who have to pack it on their backs leave the pads back in the field trains or in an accompanying vehicle. (For the most part, unless I was required to carry one or I was in a mech unit, I left mine in the locker in my room or later, at my apartment; my roommate in Korea cut his up, using parts of the pad to line a buttpack and using it as a camera bag.)

Sweater: Synthetic or wool sweater, probably of civilian make. Could be any of a myriad of colors, construction, and materials.

Thermal Fatigues: Woolen fatigues for winter use. Includes socks and boots.

Winter Sleeping Bag, Basic Issue: A standard sort of winter sleeping bag, issued as part of MOLLE or TA-50 Gear.

Wool Undershirt: A heavy overshirt worn under the fatigue shirt or without one if in a field position. It has a button top front and a collar, and is preferred by many instead of the long underwear undershirt.

Item	Weight	Volume	Protects Against (Degrees F)	Price
Air Mattress	0.34 kg	Light	7	\$50
Animal Skin Clothing	3-15 kg	Heavy	10-40	\$15-60
Animal Skin (Large)	5-15 kg	Heavy	10-30	\$15-45
Blanket, Civilian	2-10 kg	Medium	10-30	\$18-30
Blanket, Fur-Lined	10-30 kg	Heavy	20-40	\$20-50
Blanket, Military	10 kg	Medium	20	\$24
Camouflage Smock	0.25 kg	Light	5	\$5
Civilian Winter Coat	3 kg	Medium	30	\$300
Cold Weather Gear	9.21 kg	Heavy	99 (Total)	\$773
Cold Weather Gear - Field Jacket Hood	0.1 kg	Light	15 (Head); 5 (General)	\$30
Cold Weather Gear – Insulated Boots	7 kg	Heavy	50 (Feet); 14 (General)	\$171
Cold Weather Gear – Pile Cap	0.12 kg	Light	16 (Head); 6 (General)	\$34
Cold Weather Gear - Scarf	0.08 kg	Light	5 (Head); 3 (General)	\$21
Cold Weather Gear – Sweater	0.5 kg	Light	20	\$67
Cold Weather Gear – Wool Gloves with Outserts	0.16 kg	Light	33 (Hands), 6 (General)	\$47
Cold Weather Gear – Wool Underwear	1 kg	Light	30	\$67
Cold Weather Gear – Wool Undershirt	0.25 kg	Light	15	\$67
Extreme Cold Weather Gear	7.18 kg	Heavy	209 (Total)	\$479
Extreme Cold Weather Gear – Field Jacket w/Liner	2 kg	Medium	40 (Liner Only)	\$47
Extreme Cold Weather Gear – Mittens w/Inserts	0.18 kg	Light	38 (Hands); 9 (General)	\$82
Extreme Cold Weather Gear – Parka	4 kg	Heavy	55	\$120
Extreme Cold Weather Gear – Poncho w/Liner	1 kg	Medium	40	\$177
Extreme Cold Weather Gear – Trousers w/Liner	1.5 kg	Medium	65	\$135
Fatigue Uniform	4 kg	Light	40	\$50
Field Jacket	1.5 kg	Medium	20	\$60
Field Jacket Light Liner	0.5 kg	Medium	35	\$105
Field Jacket Heavy Liner	0.75 kg	Medium	45	\$135
Field Pillow	0.55 kg	Light	1	\$13
Gloves, Light	0.2 kg	Light	25 (Hands), 5 (General)	\$15
Gloves, Ski	0.5 kg	Light	50 (Hands); 8 (General)	\$50
Long Underwear	0.5 kg	Light	35	\$105
Mosquito Net	0.5 kg	Medium	0	\$10
Notebook, Combat	0.2	Light	0	\$29
Overwhites	2 kg	Light	5	\$8
Poncho	0.5 kg	Light	5	\$12
Poncho/Shelter Half	0.7 kg	Light	7	\$18
Poncho Liner	0.75 kg	Light	20	\$17

Rainsuit	1.5 kg	Medium	10	\$24
Sleeping Bag, Standard	4 kg	Heavy	30	\$50
Sleeping Bag, Bivy Cover	1 kg	Light	20	\$25
Sleeping Bag, Patrol (Base Bag)	1.1 kg	Light	30	\$182
Sleeping Bag, Intermediate Inner Bag	2 kg	Light	20	\$100
Sleeping Bag, Heavy Winter	2 kg	Medium	60	\$331
Sleeping Pad, Civilian	1.3 kg	Medium	6	\$55
Sleeping Pad, Military	0.5 kg	Medium	3	\$25
Snowsuit	4 kg	Heavy	45	\$75
Wool Undershirt	0.35 kg	Light	20	\$60
Gore-Tex ECWS	18.85 kg	Heavy	263 (Total)	\$1003 (Total)
Gore-Tex ECWS - Field Jacket	1.3 kg	Medium	30	\$90
Gore-Tex ECWS - Gloves with Outserts	0.1 kg	Light	40 (Hands); 6 (General)	\$71
Gore-Tex ECWS - Insulated Boots	6 kg	Heavy	60 (Feet); 14 (General)	\$257
Gore-Tex ECWS - Pile Cap	0.1 kg	Light	18 (Head); 6 (General)	\$51
Gore-Tex ECWS - Sweater	0.3 kg	Light	26	\$101
Gore-Tex ECWS - Long Underwear	0.4 kg	Light	42	\$158
Gore-Tex ECWS - Mittens w/Inserts	0.15 kg	Light	46 (Hands); 11 (General)	\$164
Gore-Tex ECWS - Parka	3 kg	Heavy	60	\$240
Gore-Tex ECWS - Trousers w/Liner	1.3 kg	Medium	70	\$270
Poncho/Sleeping Bag	1.4 kg	Light	20	\$200
Sweater, Civilian	0.5 kg	Medium	20	\$30
Thermal Fatigues	15 kg	Large	65	\$250

Personal Gear

Assault Suit: Special assault equipment intended for use on drug lab raids, hostage rescues, and other similar situations. The suit consists of a set of black fatigues, gloves, a Kevlar helmet (with integral individual tactical radio, a throat mike and bone conduction earphones), a gas mask, tactical web gear and boots. Body armor and personal weapons must be purchased separately. Luminescent markings (such as "POLICE" or "DEA") are usually stenciled on the back and front for quick identification of friend or foe during dimly lit firefights,

Body Veil, Camouflage: Infrared-defeating body camouflage. Note that this is NOT a proper Ghillie Suit; the worst sniper's creation would put one to shame. It is an artificial analogue of a Ghillie Suit. The true sniper does not buy a Ghillie Suits; they are made by the sniper.

Brass Catcher: Usually made of plastic or cloth (some rare metal brass catchers do exist). Usually holds 100-200 rounds or links. Brass catchers do not exist for bolt-action, lever-action, or pump-action weapons, or pistols or revolvers. In Twilight 2000 terms, these became standard issue to most armies after late 1998, with supplies becoming ever more questionable, to catch those valuable shell casings.

Can Opener: Such as the US "P38," this is a simple folding wedge of steel, brass, or aluminum. Simple to carry on a dog tag chain or in a pocket; indispensable in many armies.

Canteen, 1-liter: Canteens are not intended to serve as a soldier's only water supply, but they are just that for soldiers on special missions. Because of this, characters may wish to carry two or more. Most are made of plastic, but some few are still made from steel or aluminum. They include a 1-quart metal drinking cup. Note that fuel cannot be stored in a plastic canteen; the fuel will melt the canteen over time. Though many countries' MREs come with drink mix, storing this ready-made is not recommended in a plastic canteen, as the drink mix never really washes out completely. Two canteens are a part of most countries' basic gear setup.

Canteen, 2-liter Reserve: This is a large-capacity reserve water supply, attached to the outside of a field pack or slung on a strap.

Canteen, 5-liter Reserve: This is a larger reserve water supply, usually carried inside field pack or slung on a strap.

Chaplaincy Logistical Support Package (CLSP): This is a fiberglass or Kevlar box, light yet strong, issued to chaplains and their assistants for field ministry purposes. The box is about 1x0.75x0.75 meters in size, and contains supplies needed to conduct chaplain's services for about a company-sized element at a time (about 100 troops). The box contains a laptop computer, about 40 pocket-sized religious books, various papers needed by a chaplain (such as forms for Red Cross support and notification of families of casualties), writing implements, pocket hymnals, sacramental wine, holy water, holy wafers or the equivalent, and the vestments required by the chaplain. The box functions as a makeshift altar and desk.

Clothing: Most soldiers don't worry about clothing costs; T2K characters are more interested in what clothing is still in one piece. Most troops don't really care how they look on the job, either. (In a special operations environment, this may change.) Walking into an upper-class cocktail party in grimy fatigues is not a good way to convince security that you're supposed to be there.

However, such "good clothing" may be for fatigues in better than usual condition, boots with decent soles, fatigues with underwear, etc. Under some circumstances, it may mean Class B, Class A, or Dress Uniforms, boots with a glittering shine on them, decorations, etc.

Prices given are for complete ensembles.

Combat Webbing: Commonly known as Load-Carrying or Load-Bearing Equipment (LBE or LCE), or "kit". Combat webbing consists of a set of suspenders and a web belt (giving rise to another common name, "web gear"), and may consist of any number of other pouches or gear, as follows: This may be TA-50-based, MOLLE, or any of a number of carrying systems; it is a catch-all term. The LBE is generally free in weight terms, though the GM may impose penalties or weight if he feels the PC has a large amount of equipment carried.

Suspenders and belt.

Butt pack: Named for the place it is carried, but can also be carried between the shoulders.

1-quart canteen and pouch.

Canteen Cup: Metal cup which fits inside the canteen pouch.

Personal Medical Kit: Consists of a pouch holding a field dressing, antibiotic powder, alcohol pads, minor pain reliever (aspirin, Tylenol, Aleve, or Advil or equivalent), tweezers, a small pair of scissors, Neosporin or Bacitracin ointment, medical tape, and other such first-aid supplies. Most soldiers will have other such supplies on their person.

Rifle Magazine Pouch: Holds 3 magazines.

Shotshell Pouch: Holds 6 10-Gauge, 12 12-Gauge, 14 20-Gauge, 18 28-Gauge, 27 .410-Gauge, or 12 25mm MM-1 shells. It can also come in the form of loops stitched to a heavy layered backing cloth.

Pistol Magazine Pouch: Holds 2 magazines.

Utility Pouch, Small: Holds 0.5 kg.

Utility Box: Holds 0.5kg. It is generally made of heavy canvas with cardboard sewed inside.

Holster: Carries most pistols of either NATO or Pact.

Large Belt Pouch: Usually zippered or closed with snaps. Holds 0.8kg.

A typical set-up is the suspenders and belt, 2 canteens, one personal medical kit, and two rifle magazine pouches. Other commonly used pieces of military gear are typically made to attach to the belt and suspenders or chest rig.

Cooler, Medium-Large: This is not one of those foam coolers one finds in a gas station for less than two dollars; this is a real cooler, insulated and able to keep things cold for a decent amount of time. It measures 33x38.86x45.72 centimeters, and has 3.8-centimeter walls with insulative material for cold retention. The cooler has several attachment points that allows it to be attached to a vehicle or even a person's field gear. The body is usually aluminum and also packed with insulative material, and the cover hinges open. The cooler can generally keep items cold down to 0 degrees centigrade, and unless the cooling items (ice, blue ice, etc) the temperature inside will increase by 1 degree Celcius per hour if it is left closed, or 2 degrees per period if left open. Capacity is 20 liters.

Cot, Folding: Some older models can be a pain to set up and take down. Construction is largely of heavy canvas and wood.

Cot, Light Folding: Made of thinner canvas and a lower, lighter aluminum frame.

Duffel Bag: Large canvas sack, usually with carrying straps, and a snap-hook on top to allow for the bag to be locked. Civilian versions are also available, which often have zippered sides and some external pockets. In US Navy and Marines parlance, this is a "sea bag." Carries 50kg.

Filter Straw: This is a drinking straw-like device that allows one to drink directly from a contaminated source with safety from minerals, parasites, and insect larvae. They can generally filter about a liter of water, and come in a plastic package that contains the filter within the straw and five additional filters. Each liter filtered requires another filter, so soldiers are generally careful about how much they drink through the straw.

Flashlight, "4-Battery": An adjustable flashlight often carried by police and private security guards. It also makes a very effective club. The name comes from the fact that the original flashlights of this type used four D-cell batteries, though today flashlights with three or even two batteries through just as much light.

Flashlight, Krypton: This light is three times as bright as a military flashlight, but uses a special rechargeable lithium-ion battery that lasts only 6 hours.

Flashlight, Military: This is a battery-powered flashlight of rugged construction, such as the US "angle" flashlight. This flashlight comes with red and blue lenses to allow for use in the dark without letting too much light out and to allow map reading and other such material. Every country seems to have a different flashlight it issues to its troops; this one is based on the US military flashlight.

Flashlight, Military Krypton: This flashlight is in common use by special ops forces. It is very tough, and has a light 3 times as bright as a standard military flashlight.

Flashlight, Mini Mag-Light: Popular flashlight carried instead of the normal flashlight by many US soldiers since it is every bit as bright as the angle flashlight. The light can be focused. I carried one of these in the Army, as did many of my fellow soldiers, instead of the angle flashlight.

Flashlight, Penlight: Issued to pilots and in field surgical kits. Not especially bright, but enough for closeup work.

Flashlight, TerraLUX 80 LED Aluminum Penlight: This is about the size of a penlight, but much brighter. It has a clip for attachment to a pocket or gear. It comes in gray, blue, orange, and white. It only runs for 5 hours on two AAA batteries, but the LED bulb lasts for 25 years.

Foam Sleeping Mat: This is a dense foam pad which is rolled up when carrying. This unfortunately acts as a sponge in wet weather, but smoothes out the bumps in rough ground. Most troops consider it an unneeded luxury item and don't carry one unless ordered to.

Goggles: With interchangeable tinted/polarized and clear lenses. Most are designed to allow only limited ventilation of the eye area, to keep dust out.

HALO Rig: HALO stands for high-altitude, low-opening, and refers to a particular style of parachute drop. The parachutist leaves the plane at a great height (usually over 25,000 feet (7600m) -- high enough to require oxygen gear) and free-falls to a level below radar and visual observation height before opening. The HALO rig consists of a standard parachute, oxygen tank, face mask, insulated overgarment (it gets cold up that high) and altimeter. Wt: 14 kg. Price: \$3500 (S/S).

Hammock: Normal canvas hammock with wooden end stays.

Hammock, Covered Jungle: A normal hammock with a canopy over the hammock and insect netting between the canopy and hammock.

Hammock, Light Mesh: Supports 225kg, yet rolls into a fist-sized ball.

HCP-1 (Health and Comfort Pack, Type 1): This is general issue in most Western and Middle Eastern military forces, and in lesser issue with Eastern military forces. It is also common in disaster relief organizations. Each HCP-1 is designed to equip 10 persons for 30 days. The pack consists of 10 bags and 10 boxes. Each bag contains a toothbrush, 2 tubes of toothpaste, 100 meters of dental floss, 10 disposable double-bladed razors, 2 cans of shaving cream, 3 bars of soap, a large container of foot powder, 20 moist towelettes (the large size), a bottle of hair shampoo, two sticks of deodorant, 5 ball-point pens, and a jar of petroleum jelly. The box contains a box of laundry detergent, 4 rolls of toilet paper, a comb, a small sewing kit, fingernail clippers, a hairbrush, a small mirror, a bottle of hair conditioner, a tin of shoe polish, another box of 50 moist towelettes, shaving gel (for female legs and underarms, but may also be used for faces), a writing tablet with 100 sheets of paper, a tweezers, a box of Band-aids, electric shave lotion, a bottle

of hand lotion, a bottle of mink oil, 4 bottles of sunscreen, 3 sets of boot laces, a box of 50 envelopes, 3 nail files, a shoe polishing brush, 4 hair nets, another jar of petroleum jelly, and shave powder. These items are packed in a crate. The HCP-1 is based on a US Issue item, but other countries may have similar kits.

HCP-2 (Health and Comfort Pack, Type 2): This is an additional HCP designed for female military personnel and refugees. Like the HCP-1, it is designed for 10 persons for 30 days. The HCP-2 comes in a box and contains the following items: 48 regular sanitary napkins, 72 heavy sanitary napkins, 60 regular tampons, 84 heavy tampons, 250 panty shields, 400 moist towelettes, 20 4.55-liter self-seal plastic bags, 150 76x178mm plastic bags, 10 68-liter plastic garbage bags, 10 ponytail holders, 1 hairbrush, 2 plastic combs, 50 bobby pins, and 10 personal hygiene body wipes (large versions of the moist towelette, with an additional deodorizer). The HCP-2 is based on a US Issue item, but other countries may have similar kits.

Life Jacket: Buoy's wearer's weight, plus the weight of the jacket, and 10kg. Reduces difficulty of Swimming rolls by one level for purposes of staying afloat. Usually made of foam rubber encased in thicker rubber, or sometimes cork encased in cloth.

Load-Bearing Equipment/Special Patrolling Insertion-Extraction (LBE/SPIE) System: A modular combat webbing system capable of carrying an individual's combat-essential equipment while enhancing the capability to quickly and easily conduct rappelling insertions and SPIE operations. Essentially combines LBE suspenders or chest rig, pistol belt and rappelling harness into one. Combat webbing accessories may be used with this system; pretty much, anything you can attach to an LBE-type rig, you can attach to this.

Mess Kit: A metal tray to cook food, plus a fork, knife, and spoon. The tray has three compartments, and a cover that also serves as a compartment. The central locking flat doubles as a handle so that the kit can be used to heat foods over an open fire or on a heater.

MOLLE Load-Bearing System: New issue to US forces at the start of the war, the MOLLE system consists of a load-bearing vest and pack combination connected by a special ball-and-socket that allows the pack to be dropped in less than one combat phase. The load-bearing vest (LBV) has different pouch attachments for each weapons specialist, though all have an integral belt and harness system and small removable butt pack (carries 3 kg). The pack with integral frame can carry 40 kg of goodies, and also has the following: a SINGARS radio pocket, a claymore mine pocket that contains several extra buckles and a six-magazine bandolier, a removable pouch on each side, a sleeping bag cover, and a 2-liter pressurized water bladder with a drinking hose. In addition to this, a special combat patrol pack, which is really just a small backpack, can be attached to the back for another 10 kg of supplies. Similar setups are worn by other countries' armed forces. The MOLLE system has retained some backward compatibility and most ALICE and other countries older equivalents may attach to the MOLLE or its equivalent.

The LBV may be set up as follows:

Rifleman: Six 30-round magazine pouches (three magazines each), two hand grenade pouches (2 grenades each), and one 100-round/utility pouch.

Grenadier: Four 30-round magazine pouches, 20 40mm grenade pouches, four 40mm ILLUM pouches, one 100-round/utility pouch.

SAW Gunner: Two 30-round magazine pouches, two 200-round belt pouches, three 100 round/utility pouches.

Medic: Three 30-round magazine pouches, one hand grenade pouch, one medical bag (4 kg capacity).

Shotgunner: 12 shotgun shell pouches or one 4-round magazine pouch (two per pouch), three 100-round/utility pouches, 4 hand grenade pouches.

XM25 Gunner: Eight 8-round 25mm magazine pouches, one 100-round/utility pouch.

Pack, ALICE, Medium: Standard US field pack. Carries 25kg, including 3 external pockets which carry 10kg of the total volume. (Most soldiers will put an MRE in one of them.)

Pack, ALICE, Large: Larger version of the above; typically issued only to infantry, armor, artillery, and Special Forces personnel. I quickly invested in one of these shortly after getting to Ft. Stewart. Carries 40kg, including 3 external pockets which hold 16kg of the total volume, and 3 other small pockets for miscellaneous items which close with snaps.

Pack, Civilian: Usually zippered and normally not waterproof or only nominally waterproof. Different packs vary widely in arrangement of external or internal pockets (if any). This is the sort of pack you would give your child to carry his schoolbooks. Holds 10kg. Though not much good for a soldier's normal load, they are a perfect size for packaging satchel charges.

Pack, Generic: A rucksack capable of carrying 30kg. They vary widely in form and construction.

Pack, Locopack System: Combat pack designed for use by NATO special ops forces. Locopack is a modular system with a main pack holding 20kg, 0.2kg each in two shoulder pockets, and two detachable side pockets holding 4 kg each. (These side pockets can also be attached to ALICE webbing or combat vests.) Locopack also has an integral combat webbing set which includes two

canteens, a personal medical kit pouch, and two magazine pouches (3 rifle magazines each), as well as two pouches holding 1.8kg each. Any part of the Locopack can be quick disconnected from any other. Weight: (complete pack) 4.1kg (main pack) 1.2kg (each side pocket) 0.2kg (combat webbing) 2kg (shoulder pouches/side belt pouches, each) 0.1kg

Pack, LRRP: Another alternate field pack, designed for long-range reconnaissance troops. Holds 27kg in the main pack and 4 kg in each of two quick-release side pouches. Weight: (complete pack) 2kg (main pack) 1.5kg (side pouch) 0.25kg each

Pack, ShadowPack System: A common alternative field pack (known by different names in different countries. ShadowPack has a main pack holding 10.5 kg, two quick-release side pouches holding 2.5kg each, one back pouch holding 2kg, and one buttpack, holding 4.5kg. Each pouch can be quick-released from the others and attached to standard load-carrying harness. Weight: (complete) 2kg (main pack) 0.8kg (side pouch) 0.25kg (back pouch) 0.2kg (buttpack) 0.6kg

Pack, Voltaic Systems OffGrid Solar Backpack: This is essentially a standard sort of backpack, with a main compartment, an outer pocket, and two small side pockets, as well as small open pockets inside the main pack for organization. It has a total volume (between the main pack, outer pockets, and inner pockets) of 24581 cubic centimeters. The difference comes built on to the outer pocket; it is a solar panel that can supply up to 12 watts of power, enough to charge or power small devices. One hour (even on a cloudy day) in the sun or under a decent lightbulb will give the small battery a full charge that lasts six hours. The full dimensions of this pack are about 46x30.5x20.3 centimeters. It is more expensive and heavier than typical packs of its size due to the solar setup, but otherwise has as much utility, being built stronger than Mil-Spec requirements. Access to the compartments is by zippers, except for the small pockets inside the main pack.

Parachute: A device that allows a character to leap from a perfectly good aircraft; and probably reach the ground intact. Includes main canopy, reserve canopy, and all necessary harnesses. If recovered, the parachute can be repacked and reused. A character may carry up to four times his normal load during a parachute drop (note, however, that he may not be able to carry it far on the ground).

Paraglider (Steerable Parachute): A special form of parachute permitting the passenger to direct his descent more than is possible with a normal parachute. If recovered, the paraglider can be repacked and reused. The reserve chute for this is a standard parachute.

Personal Commode: Known as a PC by the troops, these were first issued to Coalition troops during Desert Shield. It consists of a heavy, corrugated cardboard seat covered by a vinyl shell. The PC is, amazingly, capable of supporting 545 kilograms. One uses it by digging a slit trench or hole and then putting the PC above it. One of the secondary uses is as a seat on hot desert sands. The PC folds down to a package of only 0.45kg. An optional add-on is a privacy cover in the form of a waterproof tent to pull over the PC. This weighs 1 kg. If the user is careful, the PC may be re-used many times.

Radio Pouch: Designed to hold the 2km radio, but can also hold a transponder. Can be clipped to the combat webbing.

Rappelling Gear: Includes a "Swiss Seat" harness, 4 carabiners, and one pair of work gloves.

Sewing Kit: A small folding leather or plastic pouch containing four needles, four pins, a needle threader, and 10 meters each of white, brown, OD Green, and black. It is assumed that the PC knows how to sew at least enough to make repairs to uniforms. It folds into a very small package.

Shelter Half, Canvas: A waterproofed canvas sheet that can be combined with another shelter half to form a two-man tent or alone as a one man tarp or lean-to. Includes pegs, poles, and rope.

Shoulder Holster: This type of holster is specially designed to be worn under a jacket or loose shirt, holding the weapon against the body for concealment. It only works for pistols and SMGs with a bulk of 2 or less—weapons of bulk 3 can be concealed under a long coat, but shoulder-holsters aren't made for them. Weapons of bulk 4 or more can't be concealed. The harness provides space for the weapon and two extra magazines/speedloaders. Wearing a shoulder holster makes the detection task one level more difficult.

Signal Mirror: This mirror is designed for signaling aircraft or over long distances; many soldiers also use them to communicate using Morse code or predetermined signals. Many soldiers also use them when putting them on and taking off camouflage paint, and others use them when attending to certain personal needs. It is light and easy to store (I stored mine on the side of my magazines in a magazine pouch). A minor use is in starting fires, something it is only fair at doing (DIF: Survival). The signal mirror is mostly blank, but in the middle has a sight/eyehole to aim the mirror and locate the optimal angle between the sun and target. A typical signal mirror is 51x76mm.

Small Concealed Holster: A holster designed to hold a pistol of bulk 0 in a concealed position (fastened around an ankle, clipped

to a waist belt or brassiere, etc.). These holsters only hold the weapon, not extra magazines/speedloaders. Wearing a small-concealed holster makes the detection task two levels more difficult.

Snorkel Gear: A mask, snorkel, and swim fins, permitting character to swim completely underwater for periods of up to 4xCON seconds, with a minimum of surface interaction (pulling the snorkel below the surface and holding his breath). The character need only gently break the surface and can then breathe normally without making great amounts of noise or surface ripples. Spotting is done normally for characters on the surface, but characters swimming underwater are two levels more difficult.

Solar Light Cap: This is a hat (usually a baseball-type cap, though others are available) that has a solar panel built into the brim, and two lights on the front corners of the brim. This allows the wearer to work at night, on a vehicle, lighting a fire, digging through his gear, for example. The LED lights have a sliding switch on one corner behind one of the lights that allows the wearer to kick the lights up to full brightness (about as bright as a Maglite), or taken down to a soft glow. On full brightness, a charge will last for five hours; on the lowest light setting, the light will last for 36 hours. (The GM will have to estimate when the player varies the light used.) about an hour and a half are needed to develop a full charge, under sunlight, light clouds, or a decent lightbulb or lantern.

Strobe Light: A powerful flashing Xenon light used as a distress signal. Pilots are issued one of these, and they are commonly carried by other soldiers (I carried one, and it became useful more than once). From the air they are visible at a range of 15km during the day and 50km at night. The strobe will flash continuously for 9 hours.

Sunglasses, Polarized: You can get issue sunglasses in some situations, or go off the deep end and buy designer sunglasses. For game purposes, they function identically.

Survival Kit: Contains a wide variety of useful items in a high-impact plastic container that can double as a 0.7-liter canteen.

2-man Emergency Tent	Signal Mirror
High-Pitch Whistle	3 Band-Aids (assorted)
2 Gauze Pads (100x100mm)	3 butterfly Band-Aids (assorted)
4 units mild pain-reliever	1 candle
2 small flares	50 waterproof matches
6m nylon cord	0.5m wire
50mmx1m duct tape	1 razor blade
1 zip-lock bag	1 safety pin
1x1m aluminum foil	2 energy bars (1/2 day food)
5 dextrose cubes (1/4 day food)	2 salt packets
3 bouillon cubes	3 tea bags

The kit also contains 4 laminated cards containing survival tips that give the user a default skill of Survival 1 when trying to find food or make an expedient shelter. In the T2K timeline, there was a massive run on these kits in the last few weeks before nuclear strikes began.

Survival Kit, Aviator's: Though the Special Operations Kit was often acquired by aircrews, this kit was the official issue for NATO aircrews.

3-blade pocket knife	1 water bag (1-liter)
6m steel wire	10 waterproof matches
2 striker strips	3 fishhooks
1 button compass	2 large needles
4 magnesium fire starters	10m fishing line
2 energy bars (1/2 day food)	

Survival Kit, Special Operations: Unlike the above kit, this kit was primarily issued to LRSU teams, special operations units, and aviators. It is packaged in an aluminum tin, which can also serve as a cup or cooking pot.

Signal mirror	Hacksaw blade
Lanyard saw	50 waterproof matches
Flint and steel	1-liter water bag
3 fishhooks	2 razors
10 Band-Aids (assorted)	4 gauze pads (100x100mm)
20 salt tablets	10 units mild pain-reliever
1 high-intensity chemlight	Notepaper and pencil
50mmx2m duct tape	1 Pair tweezers
1 candle	3m snare line
10m fishing line	Button compass
4 large Band-Aids (assorted)	3 safety pins

5 units +/- antibiotic	1 roll medical tape (25mmx5m)
1 flare	2 energy bars (1/2 day food)
1 Sharpening stone	20m nylon cord

The kit also comes with a set of survival tips, but these were rarely used by the units to which the kits were issued (they already knew the information).

Survival Knife: Knife with hollow handle to store survival gear. The knife is not properly balanced for throwing (FOR:Thrown Weapon), but the butt can be used as a hammer. The blade is tool grade and not what is normally considered weapon grade, but still useful in a fight. In addition to the supplies listed below, 0.1kg of other gear can be carried in the handle.

Lanyard Saw	5m Thread
3 Fishhooks	6 Waterproof Matches
1 Sharpening Stone	3m Snare Wire
10m Fishing Line	2 Needles
Button Compass	

Tarp: Waterproof heavy canvas, often issued with vehicles. This tarp is 2x3 meters, but many other sizes are available. Weight: 5kg; Price: \$16 (V/V)

Tent, 1-Man: A small oval tent, typically made of Gore-Tex or waterproofed nylon. It is just big enough for a soldier and his immediate gear and rucksack, though conceivably the gear could be left outside and two men crammed inside. Includes pegs and stays.

Toilet Paper: Paper of the kind you'd find in a public restroom or military latrine, and not something like Charmin or Cottonelle. One roll of normal size (not a double roll or triple roll).

Vest, ALICE: This simply a canvas vest with 30 attaching loops on the front and back for gear that clips on with standard clips. It replaces the standard LCE harness, and is more comfortable and quiet than the standard harness, as well as allowing for more individual preference in arranging equipment.

Vest, Battle: This is an LCE originally developed for Israeli Defense Forces and since adopted worldwide by police and military forces. It consists of a canvass harness with 4 rifle magazine pouches (2 magazines each), 3 grenade pouches, personal medical kit pouch, 1-liter canteen and pouch, 1 buttpack, 1 knife/bayonet sheath, and 4 miscellaneous attachment points. A sore point among soldiers is that the pouches close with Velcro strips, which can become painfully loud when someone is trying to be quiet.

Vest, Commando: This vest was developed for IDF special operations forces, and has since been adopted by special forces worldwide. It consists of an adjustable canvas vest with a holster and pistol magazine pouch, knife/bayonet sheath, personal medical kit pouch, 2km radio pouch (plus a microphone and cord holder on the front of the vest), 2 rifle magazine pouches (4 magazines each), 1 grenade pouch (2 grenades), 1 buttpack, 1 canteen and pouch, 4 shotgun loops, and one miscellaneous pocket and 4 miscellaneous attachment points. This vest has the problem with Velcro closures.

Vest, Fishing: These vests have been widely pressed into use as combat vests by civilians and militia forces. A typical vest (for game purposes) has 11 large and 14 small pockets (typically zippered, both inside and out and can hold up to 12kg of gear. A person might not find his gear as easily accessible as he would in a military vest.

Vest, Pilot's Survival: This is also used by US armor crews (a similar vest is worn by NATO armor crews). It is a nylon mesh vest with 3 large and 3 small zippered pouches on the chest, a holster (merely enough to hold the pistol in place, not to protect it from the elements), a knife/bayonet sheath, and four small and one large miscellaneous attachment point. Two more pockets are found on the inside of the vest. The vest comes in five sizes. It can hold 6.2 kg.

Watch, Military: Simple watch with a luminous dial and an easy-to read hands and numbers. Watches such as these are typically issued by the unit as team leader level and above. They are tough and designed to take a great deal of abuse.

Waterproof Bag: This is generally used to keep items within a rucksack or duffel bag dry, and they hold 10 kg. A little trick most soldiers know is to take an extra bag when deploying to cold climates; you slip the waterproof bag over the end of your sleeping bag and it will keep your feet and legs warm.

Water Purification Tablets: These are small tablets, and generally two or more are required to purify water to a point where it is safe to drink. It does this by neutralizing harmful minerals and killing harmful insects, larvae, and other wildlife that may be in the water you just picked up. They are generally based on iodide, which leaves an extremely foul taste (a strongly metallic taste) in the water, though it is safe to drink. A 1-liter canteen may take two tablets, while a 5-liter canteen might require ten or more. The water is

generally swished around in the container; the tablets dissolve in the water and need to be thoroughly mixed with the water.

Wet Wipes: This is a simple (usually) sealed package of cloth/paper wipes impregnated with soap and a light amount of water. It is not enough water to wet something else, but is useful for general cleaning and washing of the body.

Item	Weight	Volume	Protects Against (Degrees F)	Price
Assault Suit	8 kg	Heavy	10	\$4100
Body Veil, Camouflage	1 kg	Light	5	\$100
Brass Catcher (Plastic)	1 kg	Medium	NA	\$15
Brass Catcher (Cloth)	0.5 kg	Medium	NA	\$5
Can Opener, P38	0	None	NA	\$1
Canteen, 1-Liter	0.1 kg	Light	NA	\$10
Canteen, 2-Liter Reserve	0.2 kg	Light	NA	\$25
Canteen, 5-:Liter Reserve	0.4 kg	Light	NA	\$50
CLSP	25 kg	Huge	NA	\$5000
Clothing, Civilian	2-10 kg	Light-Large	5-20	\$50-500 or More
Combat Webbing	2.52 kg	Large	NA	\$218
Combat Webbing, Suspenders & Belt	0.77 kg	Light	NA	\$22
Combat Webbing, Butt Pack	0.2 kg	Light	NA	\$13
Combat Webbing, 1-Liter Canteen & Pouch	0.25 kg	Light	NA	\$20
Combat Webbing, Magazine Pouch, Pistol	0.08 kg	Light	NA	\$6
Combat Webbing, Magazine Pouch, Rifle	0.2 kg	Light	NA	\$9
Combat Webbing, Pouch, Shotshell	0.08 kg	Light	NA	\$8
Combat Webbing, Holster	0.28 kg	Light	NA	\$14
Combat Webbing, Canteen Cup	0.25 kg	Light	NA	\$10
Combat Webbing, Personal Medical Kit	0.6 kg	Light	NA	\$200
Combat Webbing, Utility Box	0.15 kg	Light	NA	\$5
Combat Webbing, Utility Pouch, Small	0.08 kg	Light	NA	\$3
Combat Webbing, Utility Pouch, Large	0.1 kg	Light	NA	\$4
Cooler, Medium Large	5.3 kg	Heavy	NA	\$170
Cot, Folding	5.5 kg	Heavy	NA	\$40
Cot, Light Folding	3.2 kg	Heavy	NA	\$62
Duffel Bag	1.5 kg	Medium	NA	\$23
Filter Straw (Package)	0.5 kg	Light	NA	\$17
Flashlight, "4-Battery"	1.05 kg	Light	NA	\$40
Flashlight, Krypton	0.14 kg	Light	NA	\$30
Flashlight, Military	0.3 kg	Light	NA	\$12
Flashlight, Military Krypton	0.3 kg	Light	NA	\$45
Flashlight, Mini-Maglite	0,17 kg	Light	NA	\$22
Flashlight, Penlight	0.08 kg	Light	NA	\$13
Flashlight, TerraLUX LightStar 80	0.06 kg	Light	NA	\$19

Foam Sleeping Mat	0.5 kg	Large	NA	\$15
Goggles	0.05 kg	None	NA	\$17
HALO Rig Parachute	14 kg	Heavy	NA	\$3500
Hammock	0.7 kg	Medium	NA	\$19
Hammock, Covered Jungle	1.25 kg	Medium	NA	\$32
Hammock, Light Mesh	0.3 kg	Light	NA	\$15
HCP-1	155 kg	Huge	NA	\$1950
HCP-2	155 kg	Huge	NA	\$1950
Life Jacket	6 kg	Large	10	\$75
LBE/SPIE System	2 kg	Light	NA	\$130
Mess Kit	0.4 kg	Medium	NA	\$9
MOLLE LBS Shoulder Pack	3.84 kg	Medium	NA	\$252
MOLLE LBS LBV	0.9 kg	Light	NA	\$33
MOLLE LBS Butt Pack	0.2 kg	Light	NA	\$19
MOLLE LBS Patrol Pack	0.67 kg	Medium	NA	\$64
MOLLE LBS Rifle Magazine Pouch	0.2 kg	Light	NA	\$10
MOLLE LBS Grenade Pouch	0.1 kg	Light	NA	\$5
MOLLE LBS Utility Pouch	0.3 kg	Light	NA	\$21
MOLLE LBS 40mm Grenade Pouch	0.5 kg	Light	NA	\$25
MOLLE LBS 40mm ILLUM Grenade Pouch	0.1 kg	Light	NA	\$5
MOLLE LBS SAW Belt Bag	1.33 kg	Light	NA	\$67
MOLLE LBS Medical Kit	3.6 kg	Light	NA	\$400
MOLLE LBS Shotgun Ammo Pouch	0.6 kg	Light	NA	\$30
MOLLE LBS 25mm Grenade Pouch	1.2 kg	Light	NA	\$60
Pack, ALICE, Medium	1.4 kg	Medium	NA	\$50
Pack, ALICE, Large	2.2 kg	Medium	NA	\$80
Pack, Civilian	0.5-1 kg	Medium	NA	\$20
Pack, Generic	2 kg	Medium	NA	\$50
Pack, Locopack System	4.1 kg	Large	NA	\$325
Pack, LRRP	2 kg	Medium	NA	\$200
Pack, ShadowPack System	2 kg	Medium	NA	\$160
Pack, Voltaic Systems OffGrid Solar Backpack	3.2 kg	Large	NA	\$230
Parachute, Standard	15 kg	Large	NA	\$450
Paraglider (Steerable Parachute)	16 kg	Large	NA	\$650
Personal Commode	0.45 kg	Medium	NA	\$12
Personal Commode, Privacy Cover	1 kg	Small	NA	\$50
Radio Pouch	0.1 kg	Small	NA	\$10
Rappelling Gear	1.1 kg	Small	NA	\$80
Sewing Kit	0	NA	NA	\$10
Shelter Half, Canvas	1 kg	Small	40 (Two Halves)	\$25
Shoulder Holster	1 kg	Small	NA	\$50
Signal Mirror	0.3 kg	Small	NA	\$12
Small Concealed	0.3 kg	Small	NA	\$25

Holster				
Snorkel Gear	2 kg	Medium	NA	\$120
Solar Light Cap	0.14 kg	None	NA	\$40
Strobe Light	0.14 kg	Small	NA	\$50
Sunglasses, Polarized	0	None	NA	\$40-250
Survival Kit	0.5 kg	Small	NA	\$40
Survival Kit, Aviators'	0.14 kg	Small	NA	\$30
Survival Kit, Special Operations	0.3 kg	Small	NA	\$150
Survival Knife	0.5 kg	Small	NA	\$75
Tarp	5 kg	Large	NA	\$16
Tent, 1-Man	1.3 kg	Medium	40	\$60
Toilet Paper	0.6 kg	Small	NA	\$10
Vest, ALICE	0.28 kg	Medium	3	\$40
Vest, Battle	2.47 kg	Medium	3	\$300
Vest, Commando	1.68 kg	Medium	3	\$270
Vest, Fishing	2 kg	Medium	3	\$30
Vest, Pilot's Survival	0.62 kg	Small	2	\$65
Watch, Military	0	None	NA	\$20
Waterproof Bag	0.1 kg	Small	NA	\$6
Water Purification Tablets	0.1 kg	None	NA	\$6
Wet Wipes	0.25 kg	Small	NA	\$4

RADARS AND SURVEILLANCE EQUIPMENT

AN/GRC-17-2 Ground Surveillance Radar System: The AN/GRC-17-2 is a very advanced, ground-based, surveillance radar system. This unit consists of three pieces: the antenna, the power unit, and the radar receiver-transmitter. The unit is capable of picking up the motion of a ground vehicle at 10 kilometers, an aircraft at 25 kilometers, or a man at four kilometers. It requires the successful passing of a Electronics:ESY task check to set up the unit and a Computer:AVG task to operate it. Wt: total, 32 kg; antenna, 10 kg; power unit, 12 kg; radar unit, 10 kg Cost: \$20,000 (R/R)

Audio Recorder: Audio recorders record sound from a designated source (usually they include a small condenser microphone). Any character with Electronics skill can hook one up to a wire-tap or a broadcast monitor. They come in simple and advanced varieties; both types use standard audio cartridge tapes. The simple variety merely records sound. The advanced recorder has better recording quality, including the ability to record a greater sound range (including ultrasonic and subsonic), varied playback speeds, and so on. Wt: Simple, 0.3 kg; advanced, 2 kg ; Price: Simple, \$75 (V/V); advanced, \$750, (S/S)

Audio Recording Cartridge: A cassette that records sounds from an audio recorder. Available in one-, two-, three- and six-hour versions. Wt: Negligible. Price: \$1 per hour of recording time.

Bore-Scope: A fiber-optic light guide, inserted into a room or container and allowing a view of that space's interior. Telescopic or wide-angle lenses can be fitted. The image is then carried via optical cable to the human eye, camera or TV monitor, regardless of twists, coiling or bends. The cable is trimmed to a specific length when purchased and cannot be shortened or lengthened after that time. For technical reasons, the diameter is 5mm, and maximum length 20 meters. Wt: 0.5 kg per meter; Price \$3000 per meter (C/S)

Broadcast Monitoring Equipment: This kit, combined with an electronics repair kit, permits characters with Electronics skill to listen in on cellular phones, radios and other broadcast signals, provided that the operating frequency of the broadcast source is known. Wt: 1 kg; Price \$400 (C/R)

Bugs: Electronic listening devices come in three stages, with each higher stage representing greater complexity and concealability. Stage I bugs are rather large (roughly 2x3x1 centimeters) and sport a small whisker antenna. They have a broadcast range of 0.5 kilometer, broadcasting continually for 24 hours between recharges. They may be hooked to a building's electrical system (an Easy: Electronics task). Since they broadcast continuously, they are easy to detect: an FM radio tuned to the correct frequency can receive their signal.

Stage II bugs are smaller (one-centimeter cubes with a whisker antenna) and have 36 hours of broadcasting time and a broadcast range of one kilometer. They may be bought as voice-activated, extending their actual charge life (the unit only uses energy when it hears something to broadcast).

Stage III bugs are very small (5mm cubes with whisker antenna), have a range of 200 meters and a broadcasting charge of 12 hours between recharges. They are voice-activated.

Wt: Negligible. Price: Stage I, \$150 (V/C); stage II, \$450 or \$550 for voice activation (C/S): stage III \$1100 (S/R)

Bug Detector Kit: This briefcase-sized kit contains several sophisticated electronic devices designed to detect common electronic bugging devices and neutralize them. Once detected, the bugs can be located and destroyed, jammed or masked (a jammer and a white-noise generator are included). Locating bugs without a bug-detector kit is a Difficult: Observation task to find stage I bugs. No other kind of bugs can be found without a bug-detector kit. Locating bugs with a bug-detector kit uses the Electronics skill. Locating Stage I bugs is Easy; locating stage II bugs is Average, and locating stage III bugs is difficult. Wt: 6 kg; Price \$2500 (C/R)

Bug Monitor: A special radio with an integral audio recorder. Can be tuned to any bug frequency. Uses standard audio recording cartridge tapes. Wt: 0.6 kg; Price: \$750 (C/S)

Camera Briefcase: A briefcase equipped with a concealed cut-out for a camera lens, and an activator button on the handle. It can conceal an advanced still camera, a digital camera, or a video camera. Wt: 2 kg; Price \$150 (C/S)

Digital Sound Processor: Digital sound processing (DSP) manipulates sound waveforms as bits of data and allows much greater alteration of audio input than the analog sound processor described above. This item requires DIF: Computers Skill to use properly. Because it is heavily computer based, the DSP has the same processing capability the FSP does but also has the following:

Speech Repair/Extrapolation: This is the synthesization of words missing in the audio input but either identified by computer or

deduced by context in the conversation.

Transtation: Once identified, the computer can synthesize the speech as it were spoken in another language.

Voiceprinting: The Computer automatically generates a voiceprint from the spoken sample.

Switching: The computer is able to synthesize the speech as if it were spoken by a different person.

Voice Stress Analysis: The computer can also add or eliminate microtremors which indicate voice stress.

Keyword Scanning: The computer is able to search for specific keyword and phrases in the speech, then flag them for the surveillance expert's attention.

Mixing: The DSP allows the blending of multiple audio sources so as to appear that only one source was used.

Current Tech: In current technology, the DSP is limited to post-processing because of its bulk and power requirements. The DSP presented here is actually a special board for a personal computer. The board allows all DSP functions except speech repair/extrapolation and translation. Functions at this stage require custom software and much more powerful computers. This system is available to all civilians in Western nations. Wt: N/A; Cost: \$800 (board), \$500-\$2000 (software).

HI-Tech: The DSP is shrunk down so that it will fit within a palmtop computer for real-time processing. Speech repair/extrapolation and translation functions become available to laptop and desktop computers, but require custom software. The custom software is only available to government agencies.

Directional Microphone: Also called a "shotgun mike," this device permits the user to electronically "eavesdrop" on normal conversations at ranges of up to 500 meters. It functions off an internal battery, and requires 30 seconds to set up and tune. Wt: 5 kg; Price: \$3000 (C/C).

Directional Tracker: This device is used to track transceivers, hidden microphones, trail mikes, and radios (if properly tuned). A directional tracker is the size of a small briefcase. Proper reading of the device is AVG: Electronics or DIF: Intelligence, and will give only a general distance to the target (i.e. near, far away, in between, etc.). Powered by internal batteries. Weight: 4.5kg; Price: \$1200 (S/S)

Electronic Voice Mask: This device transforms a person's telephone voice into something else, clearly distorted but unrecognizable, even with a voice stress analyzer. Wt. 2 kg; Price: \$300 (S/C)

Fiber-Optic Sensors: It is a little-known fact that the pattern of modulation in a fiber-optic cable varies with the pressure placed on the cable. NATO considered using this principle in an array of ground-sensor mechanisms in Europe to pick up advancing tank vibrations. The fiber-optic sensor can also be used as a microphone inside buildings. The fibers must be placed within the targeted building, either inside a wall or attached through adhesives, then illuminated by a tiny diode laser. A photoreceptor on the other end of the fiber picks up the laser light modulated by any sound in the environment, and passes the data on for transmission or storage.

Current Tech: This kit consists of a five-meter spool of optical fibers, a diode laser and transformer so the laser can feed off of house AC current, and a photoreceptor module with a serial output jack. Available to the general public in Western nations in component form. Assembled kits are only available to government personnel. Wt: 1.3 kg.; Cost: \$1200 (R/-).

Hidden Microphone: A generic term for a "bug." A hidden microphone is ranges in size from tiny devices less than pea size to more normal microphones about the size of a silver dollar. Sound resolution is usually related to size, with smaller devices being less readable. The microphone transmits continuously once activated, for two weeks. The microphone is readable at 1500 meters, though a character with Electronics skill can pick up the signal at 3000 meters (AVG:Electronics) or even 4500 meters (DIF:Electronics), a check being required each phase. Weight: Negligible; Price: \$200 (C/C)

Laser Microphone: A device that projects a laser beam onto a windowpane and translates the sounds in the room from the vibration of the pane. An Easy: Electronics task allows the operator to listen in on conversations hundreds of meters away. All that is required is uninterrupted LOS to the target window, and a relatively flat trajectory between window and laser microphone. Wt: 5 kg; Price:\$1500 (S/R)

Miniature Camera: These are miniature versions of the advanced or digital still cameras. They can be made to resemble cigarette lighters, breath spray bottles, wristwatches, etc. Wt: Negligible; Price: Advanced, \$1000 (C/R); digital, \$2000 (R/-)

Motion Detector: An electronic motion detector that uses ultrasonic waves to detect moving objects. Any moving object larger than one centimeter moving in any one dimension will trip the device (speed and size can be adjusted as desired). Motion detectors can be set up to sound an alarm, signal a switchboard or activate another device (like a camera or mine). Motion detectors detect an area up to five meters in radius (the exact radius is set when the detector is set) and can be deployed in numbers to scan large areas. They are not much use in areas where there is a lot of motion, such as areas with wind-blown foliage, etc. Wt: 3 kg; Price \$2000 (C/C)

Parabolic Booster: A small dish-shaped booster used to increase the range and acuity of a sound amplifier 30 times. The booster also allows the user to zero in on specific sources and eliminates confusing background noise. Wt 0.2kg; \$60 (R/R)

PRD-303/SV Surveillance System: The PRD-303/SV is a small motion sensor with 120 degrees of covered arc. It detects the motion of solid objects between one and two meters off the ground. Several PRD-303/Ss are usually tied into a single PRD-303/V. Effective range of the sensor is about 250 meters in open terrain.

The PRD-303/V can receive signals from up to 10 different PRD-303/Ss, tell which one has been tripped, and inform the operator of the motion. The PRD-303/V can be located up to two kilometers away from the sensors, as long as it has an unobstructed line of sight.

Setting up the PRD-303/V is a Computer: ESY task. Implanting the PRD-303/S is an Electronics: AVG task. Operation of the unit is a Computer: AVG, task. Wt: sensor, 0.75 kg, receiver, 3.3 kg; Cost: sensor \$700; receiver \$1800; Both (R/R)

Radioactive Trace Dust: This fine dust can be placed on the ground, on tires, on shoes, etc., in order to trace something. It leaves a faint trail on the ground for 200 to 2000 meters. Beyond that, it leaves no trail, but traces will remain on the marked person or object. Radioactive trace dust can only be detected (and followed) with a Geiger counter. Wt: 0.5 kg per dose; Price: \$200 per dose (R/S)

Radio Direction Finder: A specialized radio receiver designed to determine the specific direction a particular radio broadcast is coming from. These are useful for a variety of tasks. Getting a directional fix using one of these is a task (Easy: Electronics) and requires one minute (provided that the signal stays on the air that long). The result is a compass bearing, not a distance. Two or three such RDF units, spaced far apart, can get two or more bearings for triangulation of broadcast source. Wt 2 kg; Price. \$1500 (C/C).

Revolver Camera: A miniature camera mounted on the side a revolver, the camera "fires" every time the trigger is pulled. In essence, it is a gun camera for revolvers. It can be mounted on the side of rifles and submachineguns, but not semiautomatic pistols. The photographs are for verifying that the target was hit by the weapon. Wt: 1 kg; Price: \$250 (R/-)

RF Scanner/Filter: The RF scanner is an incredibly useful device for SIGINT (SIGnals INTelligence) spooks. This device is capable of picking up RF emissions across a wide band and passing them along to other devices for processing. To operate the scanner/filter properly is AVG: Electronics. What can be done with this device is nothing short of amazing.

For example, the device could detect RF emissions of computer monitors, allowing other monitors following signal processing, DIF: Electronics to reproduce what is displayed on the eavesdropped monitor. The same can be done with computer microprocessors. Or cordless and cellular telephones. Or radio transmissions. The scanner/filter can pick up transmissions within the range of the transmit. For low-power emissions, such as monitors and microprocessors, this is limited to 200 meters. For cordless/cellular telephones, this is one kilometer. For all others, range is indefinite and depends on transmitter strength. Also, Such devices can be used as direction-finding gear to locate RF emissions. This is DIF: Electronics.

Current Tech: This device is a small, hand-held unit with an LCD display showing the current frequency and signal strength. An attached speaker/headphone jack can be fed into processing equipment. This device is available to any civilian in Western nations. Wt 2 kg; Cost: \$750. (S/R)

Seismometer: Detects movement by detecting tiny tremors. Detects movement within a 25m radius of the detector. Powered by internal batteries. Comes in two versions: one is connected to the receiver by commo wire; the other transmits to the receiver by radio up to 2000m away. The receiver can handle up to 6 seismometers. The detector can be tuned to detect even animal-sized tremors or ignore anything up to large vehicles. Setting the seismometer is ESY: Electronics or Computer; or AVG :Intelligence or Combat Engineer. Wt (receiver) 2kg (detector) 4kg; Price (receiver) \$1250 (radio receiver) \$3750 (detector) \$3750 (radio detector) \$11250 (R/R)

Shortstop Electronic Protection System (SEPS): This is an electronic countermeasures system designed to predetonate fused artillery shells, mortar shells, and artillery rockets. When operating, these rounds detonate in the air out of range to do the protected ground troops any harm. The system protects all units within 250 meters and predetonates all HEDP, HE, FAE, AA, and WP rounds 50% of the time before they can do any harm to the protected units. This unit will protect all troops, not just friendly ones, within the radius of effect. This unit requires 30 seconds to set up and activate. Weight: 11.4 kg; Price: \$200,000 (-/-)

Sound Amplifier: This device consists of a flashlight-sized sound-gathering microphone and earphones. The device amplifies sound to the point that a whisper could be heard at 100 meters. The amplifier has a dampener to prevent hearing damage from sudden loud noises. It is not always possible to distinguish near noise from far noise. The amplifier works in a 45° arc in the direction it is pointed. Powered by internal batteries. Wt 0.9kg; \$80 (R/R)

Special Vision Adapter: This device allows an advanced or digital still camera, or a video camera, to be attached to an IR scope, starlight scope or image intensifier. Wt: Negligible; Price: \$25 (C/S)

Still Camera: These cameras record a visual image on film (or in digital memory). There are three Versions:

Simple. A one-shot, self-contained camera-in-a-box. You take the pictures, turn in the camera at a developing center, and receive the developed pictures in an hour.

Advanced. A quality, 35mm, film-using camera with a complete set of lenses and accessories (telephoto lenses, etc.) in a convenient, padded shoulder-bag. The advanced camera's film requires darkroom developing.

Digital. It comes with complete accessories and uses digital memory to store its images. A digital camera memory is read into a computer, and the computer's printing systems are used to print the picture. The advantage of digital cameras is the ease of transfer to data systems where the picture may be electronically enhanced analyzed or altered. Wt: Simple, 0.3 kg; advanced, 3 kg; digital, 2 kg; Price: Simple, \$10 (C/C); advanced, \$850 (C/C) (film costs \$8 for 24 exposures, and developed pictures cost \$0.50 per picture); \$1200 (R/R)

Telephone Oscillograph: This device is the size of an average hardbound book. It can record the dialing sound of a tapped phone and then identify any number called from that phone. Wt: 6 kg; Price:\$1000

Telephone Scrambler: Works just like a radio scrambler, but for telephones. Wt: 0.3 kg; Price:\$250 (S/C)

Telephone Tap Analyzer: A cigar-box-sized device that locates and verifies the presence of any taps on any connected line out to 10 miles. It also identifies the location of the tap. A recorder can be wired in and activated to record the tapped conversations. Detecting a tap analyzer while operating a tap is a Difficult: Electronics task. Wt: 1 kg; Price: \$500 (R/S)

Telephone Tap Detector: A cigar-sized box device that contains a signal light that lights up whenever an extension phone is lifted, or when a transmitter or telephone bug is placed on the phone line or the telephone itself. The light stays lit until reset by the user. Fooling a tap detector requires that the tapper knows that the detector is there, and then is a Difficult: Electronics task (and the tapper can't know he's successful until he gets a look at the defector or otherwise learns it is or isn't working). Wt: 2 kg; Price: \$500 (S/C)

Tracker Bug: This is a miniaturized transponder that allows tracking with a radio-direction finder, which detects the signal put out by the tracker bug. It is about the size of an aspirin tablet and has one-kilometer range (it can't be hooked up to an antenna like a standard transponder) and an internal battery giving it six hours broadcast time (rechargeable by anyone with Electronics skill and an electronics tool kit). It has a self-adhesive coating on one for attachment to a vehicle or whatever is being tracked moving the tracker bug from its plastic carrying case activates it. Wt: Negligible; Price: \$1800 (S/-)

Video Cameras: Cameras to capture continuous audio and video data. They use standard video recording cartridges. The two versions are large and small. The large version is about 40x25x5 centimeters and takes steadier pictures due to its larger size and greater stability. The small version is 5x3x3 centimeters (videotapes have gotten much more compact). Wt: Large, 2.5 kg; small, 0.5 kg; Price \$750 (C/C), Small \$950 (C/R)

Video Recording Cartridges: Six hours of video and audio recording. Wt:0.1 kg; Price:\$5 (C/R)

Wire-Tapping Tools: This kit, combined with an electronics repair kit, permits characters with Electronics skill to tap into and monitor electronic communications lines (phone lines, mostly). Wt: 2 kg; Price \$300 (C/R)

RADIOS AND COMMUNICATIONS EQUIPMENT

British Radios

Caracal (PRM 4740A) Secure Hand Radio: These British-made radios were sold to a Middle-Eastern nation (possibly Kuwait), and are rumored to be used by US Special Operations, British SAS, and British SBS units. They are possibly the smallest radios to incorporate frequency-hopping technology. 10 channels may be preprogrammed for quick frequency changing, and they are interoperable with US and allied frequency hopping radios. Weight: 1 kg; Price: \$4,000

Cougarnet (PRC6515) Hand/Manpack/Vehicular/Ground Radio: This British-made radio is used by the British Army and Navy, civilian agencies in Great Britain and elsewhere, and has enjoyed some foreign military sales, most notably to the US Air Force. The radio is able to bridge communications using UHF and VHF, especially when acting as a repeater. Cougarnet may be powered by a battery, vehicular power, or a 1.5 kW generator. The radio is modular, plugging into a variety of amplifiers for hand (2km range), manpack (10 km range), or vehicular/ground mount use (20 km range). Only the vehicular/ground version may be used as a repeater, but all versions may send and receive VHF and UHF traffic. A scrambler may be added by use of a cable. Weight: (Hand unit) 2 kg, (Manpack) 16.5 kg, (Vehicular/ground) 20 kg; Price: (Complete system): \$2,300

Jaguar-V Secure Manpack Radio: This British radio is used by that country and several NATO countries, Oman, Cyprus, Saudi Arabia, Brazil, and an unnamed Latin American country; a total of 42 countries worldwide are using this radio. Use of this radio began in the Desert Storm. It is a frequency-hopping radio with considerable ECCM capability, resisting jamming by constantly shifting hopsets to unjammed frequencies. Security is further heightened by use of a scrambler. The Jaguar-V can also be used for data transmission at a rate of 16 kbps. The Jaguar-V may tolerate up to 50 radio nets, each with dozens of radios, at once, if each net is frequency hopping in a different sequence, and still transmit to all of them. Short range is 5 km with a whip and 20 km with a long antenna. Weight: 7.5 kg; Price: \$4,200

Jaguar-V Secure Vehicular Radio: This is the same radio as above, linked to a mounting base, a longer antenna, and a high-power amplifier. Range is 50 km. Weight: 14.1 kg; Price: \$23,000

Panther 2000-V Secure Manpack/Vehicular Radio: This British radio is one generation advanced from the Jaguar-V set of radios, and was just beginning to be adopted by the British military and some NATO countries at the outset of the Twilight War. It is based on the Jaguar-V, but is much lighter. The Panther 2000-V is a frequency-hopping radio with antijamming ECCM capability, and also has a scrambler to further protect communications. If a Panther is captured, a signal can be sent from a secure radio to block the captured radio from the net, preventing it from broadcasting or listening to friendly frequencies. In addition, if an attempt is made to extract operating codes or hopsets from the radio without following the proper procedures, the radio destroys all codes and hopsets without revealing the data. The Panther may also function as a 16 kbps modem. The Panther is resistant to EMP from nuclear blasts, and thus may be one of the few digital radios operating after a nuclear battle. The radio may be remote-controlled from a range of 4 km. Short range is 5 km with a whip or 20 km with a long antenna. Weight: 6 kg; Price: \$5,200

Panther 2000-V Secure Vehicular Radio: This is a Panther 2000-V Manpack Radio as above, with a Vehicular Interface Unit (VIU) and power amplifier. Range is 50 km. Weight: 8.69 kg; Price: \$25,000

PRC/VRC 2000 Manpack/Vehicular/Ground Radio: This is an older British-made radio operating in the HF band. It entered service in 1981 with several African, Middle Eastern, and Latin American countries. Middle Eastern countries have mostly switched to newer secure radios, but the PRC/VRC 2000 may still be found in service with the African and Latin American countries. The radio is not secure, but can be used as a low-speed modem, with a speed of 600 bps. A scrambler may be added with a cable. Range is 4 km with a whip and 15 km with a long antenna for manpack operations, or 20 km on a vehicular or ground mount. A 1.5 kW generator is required for ground mount operations. Weight: 8.5 kg; Price: \$1,550

PRC/VRC 2000 Manpack/Vehicular/Ground Radio: This is an older British-made radio operating in the HF band. It entered service in 1981 with several African, Middle Eastern, and Latin American countries. Middle Eastern countries have mostly switched to newer secure radios, but the PRC/VRC 2000 may still be found in service with the African and Latin American countries. The radio is not secure, but can be used as a low-speed modem, with a speed of 600 bps. A scrambler may be added with a cable. Range is 4 km with a whip and 15 km with a long antenna for manpack operations, or 20 km on a vehicular or ground mount. A 1.5 kW generator is required for ground mount operations. Weight: 8.5 kg; Price: \$1,550

PRM4021 Manpack Radio: This is a small, inexpensive, yet powerful radio in service with a number of armed forces worldwide. It is an AM radio operating in the HF band with special filters to clean up the signal-to-noise ratio, allowing for very clear transmissions, and to read transmissions that would be unintelligible over normal radios. Unfortunately, the PRM4021 requires manual antenna tuning in addition to frequency tuning. Range is 10 km. Weight: 7 kg; Price: \$835

PRM4041A Manpack/Vehicular Radio: This is one generation advanced from the PRM4021 above. Improvements include automatic antenna tuning. The antenna may be detached and located up to 10 meters away by use of a cable. Short range is 15 km as a manpack and 20 km from a vehicle. Weight: 9.65 kg; Price: \$1,800

PRM4720A Hand Radio: This lightweight radio is built by England and used by Belize, Denmark, Cyprus, Greece, and an unnamed sub-Saharan nation. It may be made secure by the addition of a scrambler, and may be used as a 16 kbps modem. Range is 1 km and cannot be boosted, even with the addition of an amplifier, though its signals may be rebroadcast via a repeater. It is generally used as a short-range squad radio. Weight: 0.6 kg; Price: \$500

PTR349 Hand Radio: This radio was designed to be used by patrols and ambushing parties; the radio is capable of amplifying whispered communications to normal volume at the receiving end. It is small, but very powerful for a radio its size. Short range is 2km with a short 0.5m whip and 2.5 km with a longer 1m whip. The PTR349 is built by Britain and used by several countries in Europe, Africa, and the Middle East. Weight: 1.6 kg; Price: \$1,250

PTR4402 Secure Manpack/Vehicular Radio: This frequency-hopping radio is used by Canadian FALO teams and air controllers. The radio is highly resistant to ECM and ESM, hopping frequencies almost instantly to avoid jamming and surveillance. The PTR4402 may be used for digital, voice, and data communications. It may be remote controlled at a range of 15 meters. Short range is 5 km with a whip or 16 km with a long antenna in the manpack mode, or 50km with the vehicular adapter. The radio is tough, able to survive being immersed in water for 2 hours or dropped from a height of 1.2 meters without damaging it. Weight: (Manpacked) 4.75 kg, (Vehicular adapter and amplifier) 13 kg; Price (Manpack set) \$3,500; (Vehicular set) \$23,100

PVS1430 Vehicular/Ground Radio: This British-built radio is used by Egypt, Iraq, Kuwait, Libya, Oman, and some African and Far Eastern nations. It is compatible with both Western and Eastern-Bloc vehicles. It may also be powered by both sides' generators with at least 1.5 kW power. It may transmit both voice and data (16 kbps). Short range is 3 km with a whip or 24 km with a normal antenna. Weight: 12 kg; Price: \$2,800

PVS1850 (Smalltalk) Manpack Radio: This is claimed by the manufacturer to be the smallest radio in its class. It is designed to be used by patrols, ambushing parties, parachute drop zone communications, internal security, and other short-range applications. It can translate a whispered voice on its end into a normal-volume voice on the receiving end. Short range is 2 km. This radio is used by the British and by various armed forces in Africa, Asia, and Latin America, as well as Iraq and Qatar. Weight: 3 kg; Price: \$500

PVS2410 Manpack/Vehicular Radio: This British-built radio is used by armed forces in Africa, Europe, Latin America, and the Middle East. It is an FM radio operating in the VHF band, and is interoperable with other VHF radios used by the US, UK, and NATO. It may pass data at the rate of 16 kbps. The radio may be remotely operated at a range of 3 km, and may be used as a repeater. Range is 4 km as a manpacked radio, or 20 km in a vehicle mount. Weight: 8 kg; Price: \$1,800

PVS2450 Vehicular Radio: This British-made radio has been exported worldwide. It is an FM radio operating in the VHF band, designed for command use at longer ranges than the PVS2410 (above), and is more compact than that radio. The PVS2450 is compatible with US and NATO VHF radios. Multiple radios of this type may be operated on the same frequency in close proximity (such as in a command post vehicle) without interfering with each other. A scrambler may be added by using a cable. Range is 4 km using a short whip or 50 km using a standard vehicular antenna. Weight: 6 kg; Price: \$5,800

PVS5300 Manpack/Vehicular Radio: This is a small radio designed for immediate tactical communications at platoon level and below. It can operate in whisper mode, meaning that a whispered communication from the user can be amplified by the radio to be received at normal volume by the listener. The PVS5300 operates in the HF band, so as not to interfere with higher-level communications. Short range is 4 km with a short whip or 20 km with a longer whip. The PVS5300 is British-made, but has been exported to every continent except the Americas. Weight: 3.8 kg; Price: \$835

Scimitar Secure Manpack Radio: This is a new radio designed by England, and exported to Turkey, Nepal, Sweden, Pakistan, the Middle East, and North Africa. It is a frequency hopping radio with ECCM protection and versions that operate in the HF (Scimitar-H) and VHF (Scimitar-V) range are available; both versions use AM. Data transmission is up to 2.4 kbps. Short range is 20 km. Weight: 7.72 kg; Price: \$6,700

Scimitar Secure Vehicular Radio: This version of the Scimitar adds a powerful amplifier and a faster-acting ECCM module. Short range is 100km with a normal AM Vehicular antenna and 400 km with a longer antenna. Weight: 12.6 kg; Price: \$46,000

UK/PRC319 Secure Manpack Radio: This radio is primarily used by special operations units in Britain, the US, Australia, and New Zealand. It may transmit in both the HF and VHF bands, up to frequencies used by aircraft. Included is an Electronic Message Unit; this is a small alphanumeric keyboard that allows transmission of written words when any voice transmission would be dangerous, as well as data, coordinates, and direct communication with fire control computers and fire direction computers. The

UK/PRC319 is also a burst transmitter, able to store messages for up to 500 hours before automatically transmitting them at a high rate of speed. The radio may be operated by remote control up to 50 meters away, and the radio may be used with Vertical Satellite Beamer (see below). The burst transmission feature allows considerable security, and to increase security, a scrambler/descrambler may be added. Short range without the satellite transmission gear is 5 km with a short rod antenna and 50 km with a whip. Weight: 10 kg; Price: \$21,000

UK/PRC320 Clansman Manpack/Vehicular Radio: This is part of the old standard British tactical radio range, and is also used by other NATO countries, and armed forces in Africa and the Middle East. It is still used for some longer-range communications roles. The radio consists of an HF transmitter and receiver, a battery, and a small hand generator to recharge the battery or power the radio when the battery is dead. With the proper antenna, the UK/PRC320 may also communicate with aircraft. The vehicle-mounted variant (the UK/VRC-320/2) adds an amplifier and uses a longer antenna for extended range. A scrambler may be added with a cable. Range for the manpacked version is 3 km with a short whip and 30 km with a longer antenna. The vehicular version has range of 30 km on a short antenna and 100 km with a long antenna. A scrambler may be added by a cable. Weight (manpacked): 8.5 kg, (vehicular) 10 kg; Price: (manpacked) \$2,500; (vehicular) \$11,000

UK/PRC344 Clansman Manpack Radio: This is a short-range member of the Clansman family. It is a UHF-band radio operating on AM, and is useable for ground-to-ground and ground-to-air transmissions. It is normally used by FALO teams, naval transports and landing parties and marines. The radio can be operated by remote control at a range of 3 km, and may be used as a repeater. A scrambler may be used with this device. Short range is 4 km in the ground-to-ground mode and 40 km for ground-to-air transmissions. This radio is used by Britain, and at least two other NATO countries, Bahrain, and the Dutch Marines. Weight: 7.5 kg; Price: \$1,850

UK/PRC349 Clansman Hand Radio: This small member of the Clansman family uses a headset with a boom microphone or throat mike. It is normally used by squad leaders. It is signal-activated, meaning that the battery is kept in a low power-consumption mode until a signal is sent or received. This results in a split-second delay at transmission times, but contributes to a longer battery life (20 hours). A scrambler may be used with this radio. Short range is 1 km. The UK/PRC349 is used by the UK and Spain. Weight: 1.5 kg; Price: \$500

UK/PRC350 Clansman Manpack Radio: This was the standard British tactical radio before the advent of the Jaguar, Panther, and Cougar series, and as they were produced by the thousands and widely exported, many are still being used. Knobs on this radio are large to allow for the wearing of extreme-cold weather mittens, and the entire radio will remain operating down to -40 degrees Fahrenheit. The radio can be used in whisper mode. A scrambler may be used with this radio. The UK/PRC350 operates in the mid-VHF band. Short range is 2 km. Price: \$750

UK/PRC351/352 Clansman Manpack Radio: This member of the Clansman family operates in most of the VHF band, at a longer range than the UK/PRC350. Battery life is a full 18 hours, as opposed to the 350s 12 hours. The radio may be connected to another UK/PRC351 by commo wire to use as a sort of field telephone with links up to 3 km. The UK/PRC351 may be used with a power amplifier (in which case it is known as the UK/PRC352). A scrambler may be added by a cable. Short range is 4 km for the UK/PRC351 and 20 km for the UK/PRC352. Weight: (UK/PRC351) 7.5 kg, (UK/PRC352) 9 kg; Price: (UK/PRC351) \$335 (UK/PRC352) \$1,670

UK/VRC321 Clansman Vehicular Radio: This member of the Clansman family was designed to operate from armored vehicles, but can also be used as a ground station. It may communicate with ground and air units. A scrambler may be added to the unit. Short range is 5 km or 40 km, depending upon what length of antenna is used. Weight: 27 kg; Price: \$4,600

UK/VRC322 Clansman Vehicular Radio: This is a longer-range, HF-band radio used in command, reconnaissance, and logistics vehicles. It can also be used to communicate with aircraft. It may be equipped with a variety of microphones, handsets, speakers, data transmission units, and scramblers. It may be operated by remote control at a range of 3 km. Short range is either 40 or 300 km, depending on antenna used. Weight: 72 kg; Price: \$19,600

UK/VRC353 Clansman Vehicular Radio: This radio was designed primarily for fighting vehicles, but can also be used in fixed or mobile ground stations, running off a generator or vehicular power. It may transmit voice or data (at a speed of 20 kbps). It is a powerful unit that normally overpowers enemy jamming. It is easily and quickly set and operated. A scrambler may be used with the UK/VRC353. Short range is 1 km, 15 km, or 50 km, depending on antenna and amplifier used. Weight: 22.2 kg; Price: \$5,770

Bulgarian Radios

R-33 Manpack/Vehicular Radio: This Bulgarian radio is in common use by Pact forces. It is an older, heavier radio with a short range of 5km with a 3-meter whip antenna, or 10 km with a 10-meter mast antenna. Weight: 40 kg; Price: \$2,300

R-39 Secure Manpack/Vehicular Radio: This Bulgarian radio is a more modern design, with digital readouts and push-button input controls. Included is a 256-bit encryption set. Short range is 1-1.5 kilometers, depending on terrain. This radio can be remote controlled at a range of 3 km. Weight: 12 kg; Price: \$5,500

R-56 Manpack Radio: This is the standard tactical Manpack radio with Bulgarian forces, and is also used by other Pact forces and Bulgarian allies. It is a modern system, with digital readouts and push-button inputs. The radio has a short range of 3 km with the 2.7-meter whip antenna or up to 10km with the 4-meter mast antenna. Weight: 11 kg; Price: \$1,500

Chinese Radios

10 W SSB Manpack Radio: This is a Chinese radio set that may also be used for telegraphy. Short range is 10 km when used for voice communications, and 8 km when used for telegraphing, if using the 15-meter antenna. The radio can be powered by batteries, a generator, or a hand generator. Weight: 9.8 kg; Price: \$1,150

15 W SSB Vehicular Radio: This is basically a high-powered version of the 10 W SSB that requires vehicle or generator power. Short range is 50 km when used for voice, or 40 km when used for telegraphy. Weight: 7.7 kg; Price: \$5,800

125 W SSB Vehicular Radio: This is an older Chinese radio for shorter-range communications. Short range is 7.5 km. Weight: 22 kg; Price: \$865

200 W SSB Vehicular Radio: This Chinese radio can be used for voice, telegraph, and Teletype traffic. It has a very long range of 125 km (short), and can be remotely controlled at a range of 3 km. Weight: 28 kg; Price: \$14,000

BWT-22B Manpack Radio: This is an older Chinese tactical radio. It is powered by internal batteries. Though an encryption module is not supplied with the basic radio, one may be easily added by means of a cable. The radio is resistant to EMP effects. Short range is 2 km with a whip antenna or 5 km with a mast antenna. Weight: 6.9 kg; Price: \$1000

BWT-133 Manpack Radio: This is a newer Chinese tactical radio that may be powered by a battery or hand generator. It may be used for voice or telegraphy. Short range is 4.5 km with a whip antenna or 15 km with a mast. Weight: 13 kg; Price: \$2,250

HF 100W Power Amplifier: This unit may be attached to Chinese radios to boost range by 600%. It must be powered by a vehicle or generator (but not a hand generator). Weight: 6.8 kg; Price: \$9,000

XD-D2B 15/25 W Manpack Radio: This is one of the more modern Chinese designs. It may be powered from a battery, generator, or hand generator. Short range is 8 km when using a whip or 15 km when using a mast. Weight: 10 kg; Price: \$4,000

French Radios

350H Secure Manpack Radio: This is the standard manpack radio in French service. The communications are secured by means of frequency hopping, both for security purposes and to defeat jamming. The frequency switches among any of 285,000 possible channels several hundred times per second. It was designed to work in networks and to act as a modem for computers, and may be remotely controlled. Short range is 2 km. Weight: 5.9 kg; Price: \$2,000

353H Secure Vehicular Radio: This is one of the standard vehicular radios in the French military. It is basically a version of the 350H listed above equipped with a power amplifier. Short range for this radio is 20 km. Weight: 8.85 kg; Price: \$9,200

354H Secure Vehicular Radio: Another standard vehicular radio in French service, the 354H adds a second power amplifier and relay equipment for other, shorter range radios. Short range for the 354H is 100 km. Weight: 20 kg; Price: \$46,000

TRC331 Vehicular Radio: This is an older French radio most commonly found in older French-made armored vehicles. It is without security features or data transmission capability. A scrambling module or telegraph set may be added via cables. Short range is 20km. Weight: 9.4 kg; Price: \$2,300

TRC340 Manpack Radio: This is an older French-made radio for use at platoon level and above. Short range is 2 km with a 1.2-meter whip, 15 km with a 2.4-meter whip, or 20 km with a 7-meter mast. Weight: 7.9 kg; Price: \$1,000

TRC342 Vehicular Radio: This French-built radio is a combination HF/AM device. Telegraph operations are also possible. This radio has a short range of 20 km with a whip and 100 km with a mast. Weight: 25.8 kg; Price: \$11,500

TRC-344 Vehicular Radio: This is a French-built radio using the FM and AM bands. Telegraph operations are also possible. Short range is 100 km with a whip and 400 km with a mast. This radio is normally used by upper-echelon command and reconnaissance elements. Weight: 54 kg; Price: \$46,000

TRC350 Manpack/Vehicular Radio: This is a French-built radio designed for use at company level and by patrolling elements. In vehicles it is typically paired with an amplifier for longer range (and is then known as the TRC353), though it may be found without one in vehicles. The TRC350 may transmit voice and data, and features easy to change frequencies. Short range is 10 km. Weight: 9.6 kg; Price: \$5,000

TRC353 Vehicular Radio: This is basically a TRC353 with an amplifier and automatic matching unit to allow for quick frequency changes. The amplifier may be separated from the radio up to 40 meters by use of a cable. Short range is 50 km. Weight: 31 kg; Price: \$5,800

TRC354 Vehicular Radio: This is a TRC350 with a more powerful amplifier than the TRC353. Short range is 200 km. Weight: 64 kg; Price: \$23,000

TRC374 Hand Radio: This French radio was designed for difficult conditions such as jungles, deserts, and mountainous terrain. Short range is 5 km. Weight: 2.5 kg; Price: \$2,500

TRC570 Vehicular Radio: This radio is built in France and is used by that country and several overseas forces. It is designed to defeat jamming and can transmit for a Teletype machine or act as a modem at a rate of 16 bps. It can also be connected as a field telephone through the use of comms wire. Short range is 30 km. Weight: 8 kg; Price: \$3,500

TRC950 Vehicular Radio: This is a long-range French radio used by that country's FAR and several Middle Eastern countries. It incorporates a scrambler and frequency-hopping technology. Communication with computers is possible via a 16 Kbps modem, and this modem can be used to program the radio or an attached weapon system. Short range is 50 km. Weight: 12 kg; Price: \$23,000

TRC9100 Secure Hand Radio: This is a small, yet powerful French radio that allows immediate secure tactical communications. It uses frequency-hopping technology in the 33-88 MHz band as well as scrambling. Short range is 2 km. Weight: 1 kg; Price: \$4,000

TRC9200 Secure Manpack Radio: This French radio combines frequency hopping and transmission scrambling to provide excellent security for communications. It has built-in 4800 bps modem. Short range is 4 km. Weight: 7 kg; Price: \$8,000

TRC9300 Secure Vehicular Radio: This is a modular radio designed for long-range communications. It is primarily found on French command and reconnaissance vehicles. It incorporates frequency hopping and scrambling, and can be used as a repeater for other radios. Short range is 50 km. Weight: 26 kg; Price: \$23,000

TRC9500 Secure Vehicular Radio: This is the standard radio for newer French vehicles (such as the Leclerc MBT), and has been retrofitted to many other vehicles. It too uses frequency hopping and scrambling. Short range is 40 km. Weight: 13 kg; Price: \$18,500

German Radios

HRS 7000 Manpack/Vehicular Radio: This German radio was designed for the reconnaissance and special operations missions. It is a small, yet powerful radio that contains a keyboard for data transmission and frequency input as well as a conventional radio. Short range is 30 km when manpacked and 200 km when used on vehicular or generator power. The radio has ECCM features and a scrambling module. Weight: 8 kg; Price: \$14,000

SEM 52-S Hand Radio: This small radio is in use by German armed forces and has been widely exported. It may also be used as a modem, with a data transfer rate of 16 Kbps. A scrambler may be added by use of a cable. It may also be used as a loudspeaker. Short Range is 2 km. Weight: 0.95 kg; Price: \$1,000

SEM 52-SL Hand Radio: This is a more advanced version of the SEM 52-S hand radio listed above. It has twice the channels

available, and a keyboard may be plugged into the radio for data transmission and to program the stored channels in the radio. Data transfer rate is 16 Kbps. This radio is interoperable between military, police, and civilian radio nets. Short range is 2 km. Weight: 0.95 kg; Price: \$1,500

SEM 173 Secure Manpack/Vehicular Radio: This German radio is in use by that country and has been exported to several countries. Controls are all push-button and digital, and the control panel may be used as a modem (16 Kbps) or handset, or a regular handset may be plugged in. The radio has ECCM features. The smart handset may also be used to remote control the radio at a range of 15 m. The SEM 173 is equipped with a loudspeaker. This radio is a frequency-hopping radio, and also incorporates a scrambler. Short range is 5 km. Weight: 5.2 kg; Price: \$5,800

SEM 183/193 Secure Vehicular Dual Radio: These are basically two SEM 173 radios combined in one unit with an amplifier added. These radios may be remote controlled at a range of 4 km. One radio may transmit at a range of 5 km, and the other at a range of 50 km, if both are transmitting or receiving at the same time. Otherwise, the amplifier is automatically slaved to the transmitting or receiving radio. Weight: 24.7 kg; Price: \$12,700

Iranian Radios

PRC-105/A Manpack Radio: This radio has been used by Iran since the 1987. It is a compact yet powerful radio that unfortunately has a narrow range of operating frequencies (40MHz total). Short range is 0.6 km with a short rod antenna, 2.5 km with a whip, and 5 km with a mast. It is otherwise unremarkable. Weight: 4.6 kg; Price: \$1,350

PRC-122 Manpack Radio: This radio began to replace the PRC-105/A in the Iranian military shortly before the Twilight War, and was thus never fielded in any large numbers. It increases the number of channels available by 400, incorporates some ECCM protection, has a lower power setting for listening silence, and channel presets. Displays are digital and designed for low-light operation. A scrambler may be added via a cable. Short range is 0.6 km with a short rod antenna, 2.5 km with a whip, and 5 km with a mast. Weight: 4.65 kg; Price: \$1,360

RTX-5051/IR Hand Radio: This is an Iranian radio operating on a narrow band (10 MHz total), for immediate tactical communications. The radio can be used as a modem. Short range is 1 km. Weight: 0.87 kg; Price: \$500

VRC/GRC-105 Vehicular Radio: This is a PRC-105/A radio coupled with an amplifier and a software-controlled matching unit, in a frame. It has been in use by the Iranians since 1990. Other statistics are the same as the PRC-105, except that short range is 30 km. Weight: 10.5 kg; Price: \$3,500

Israeli Radios

PRC-624 Hand Radio: This radio is in common use in Israel. It is light and compact, yet powerful for a radio its size. The radio can be used as a modem with a speed of 20 Kbps. Short range is 2 km. Weight: 1 kg; Price: \$1,000

PRC-2200 Manpack Radio: This is an older-generation radio used by the Israeli military (an Israeli-made version of the US Sincgars radio, called the PRC-730, began replacing it in the late 1980's). It is still in use by second-line, home defense, and police units. Short range is 1.5 km with a rod antenna, 11 km with a whip, and 20 km with a mast. Weight: 8 kg; Price: \$17,000

PRC-624 Hand Radio: This radio is in common use in Israel. It is light and compact, yet powerful for a radio its size. The radio can be used as a modem with a speed of 20 Kbps. Short range is 2 km. Weight: 1 kg; Price: \$1,000

PRC-2200 Manpack Radio: This is an older-generation radio used by the Israeli military (an Israeli-made version of the US Sincgars radio, called the PRC-730, began replacing it in the late 1980's). It is still in use by second-line, home defense, and police units. Short range is 1.5 km with a rod antenna, 11 km with a whip, and 20 km with a mast. Weight: 8 kg; Price: \$17,000

VRC-2200 Vehicular Radio: This Israeli radio is the vehicular-mounted version of the PRC-2200. The VRC-2200 adds an amplifier, a vehicle mounting rack, and an antenna-matching unit. Short range is 30 km. Weight: 24 kg; Price: \$3,500

Italian Radios

Commando Hand Radio: This is the standard hand radio of Italy. It operates in a narrow band range (18 MHz total) in the VHF

range. It is of very rugged construction, and simple to operate. Short range is 1 km. Weight: 0.7 kg; Price: \$500

ERC-321 Secure Manpack Radio: This radio has been produced in large numbers for the Italian military and also exported to many Italian and former Italian allies. It is a lightweight, compact radio that uses frequency-hopping technology for security and ECCM. Short range is 3 km. Weight: 4 kg; Price: \$3,000

GTR-100 Ground Radio: This Italian radio was designed for use as a base station, to be run from a generator. Features include digital controls and an ability to preset up to 30 frequencies. A 1.5 kW generator is required to power this radio. Short range is 125 km. Weight: 21 kg; Price: \$14,400

PRC-738 Secure Manpack/Vehicular Radio: This Italian radio is used in heavy electronic warfare (EW) environments due to its ECCM capabilities. The PRC-738 is a frequency-hopping radio that automatically hops to an unjammed frequency set. Short range is 2.5 km on the short whip, and 20 km on the long whip. Weight: 6.6 kg; Price: \$5,800

PRC-638 Manpack Radio: This radio fills the same niche in the Italian military as the PRC-447, but operates in the VHF/FM band for shorter-range but clearer transmissions. It is also half the weight of the PRC-447. Short range is 2 km with a whip or 4 km with a longer whip. Weight: 3.5 kg; Price: \$1,170

PRC-447 Manpack Radio: This is a previous generation Italian radio, superseded by the ERC-321, but not until just before the Twilight War. It is still used in large numbers. It is used to transmit in the HF band using AM, for longer-range tactical communications. Short range is 4 km with the 2.3-meter whip or 20 km with a long antenna. Weight: 7 kg; Price: \$1,700

PRC-677A Manpack/Vehicular Radio: This is a newer Italian radio than the PRC-638. It is also used by the British military (where it is known as the MEL-8677A). This radio may be made secure by adding a scrambler, and may be used as a modem with a speed of 16 kbps. Short range is 3 km. Weight: 4.5 kg; Price: \$875

PRC-738 Secure Manpack/Vehicular Radio: This Italian radio is used in heavy electronic warfare (EW) environments due to its ECCM capabilities. The PRC-738 is a frequency-hopping radio that automatically hops to an unjammed frequency set. Short range is 2.5 km on the short whip, and 20 km on the long whip. Weight: 6.6 kg; Price: \$5,800

PRC-447 Manpack Radio: This is a previous generation Italian radio, superseded by the ERC-321, but not until just before the Twilight War. It is still used in large numbers. It is used to transmit in the HF band using AM, for longer-range tactical communications. Short range is 4 km with the 2.3-meter whip or 20 km with a long antenna. Weight: 7 kg; Price: \$1,700

PRC-638 Manpack Radio: This radio fills the same niche in the Italian military as the PRC-447, but operates in the VHF/FM band for shorter-range but clearer transmissions. It is also half the weight of the PRC-447. Short range is 2 km with a whip or 4 km with a longer whip. Weight: 3.5 kg; Price: \$1,170

PRC-677A Manpack/Vehicular Radio: This is a newer Italian radio than the PRC-638. It is also used by the British military (where it is known as the MEL-8677A). This radio may be made secure by adding a scrambler, and may be used as a modem with a speed of 16 kbps. Short range is 3 km. Weight: 4.5 kg; Price: \$875

RV-2/400 Hand Radio: This is a small radio that can also be used as a transponder in case of emergencies. It is standard equipment among Italian platoons (sometimes down to the fireteam level) and FIST teams. Short range is 1 km. Weight: 1.2 kg; Price: \$500

Polish Radios

Dracena-R Vehicular/Ground Radio: This Polish radio can be run from vehicular power or a 1.5 kW generator. It may be used for voice, telegraph or data transmission (the latter with a speed of 16 kbps). The radio used a 2-meter bar antenna, which may be mounted on a 10-meter mast for extra range. Range is 6 km with the bar antenna, or 30 km with the antenna mounted on a mast. Weight: 20 kg; Price: \$3,500

Russian Radios

AKVEDUK 5UN-1 Manpack Radio: This is small radio in use by Russian forces, including frontier troops and national guard units. It operates in the UHF band, unlike most military radios, and can also be used as a relay device, to transmit Morse code, and to transmit data at a speed of 32 bps for download to an attached computer. It may be operated by remote control at a range of 10 meters. Short range is up to 8 km, depending on terrain. Weight: 5.6 kg; Price: \$4,000

R-111 Vehicular Radio: This is a huge, old radio still used in Category 3 and Mobilization-Only units in Russia and the Warsaw Pact. Some third-world countries that were Soviet client states may also have them. The R-111 has a short range of 9 km with the short 3.4-meter antenna or 13 km with the antenna mounted on a mast. The radio may be remotely controlled at a range of 500 meters. Weight: 100 kg; Price: \$1,500

R-112 Vehicular Radio: This is another ancient Russian radio, used in low-priority units. It has a longer range than the R-111. The R-112 has a short range of 6 km with a whip antenna or 25 km with a mast. Weight: 90 kg; Price: \$2,900

R-113 Vehicular Radio: This is one of the oldest Russian radios still in service, but is still often found in Russian and Pact armored vehicles. It must be run from vehicle power or by a generator. It has a short range of 5 km, using a 4-meter whip antenna. Weight: 17 kg; Price: \$575

R-123M Vehicular Radio: This Russian radio is used in armored vehicles, primarily the 2S1 howitzer and SNAR-10 self-propelled radar system. It is roughly equivalent to US radios of mid-1970s vintage, using a variety of dials and knobs to set it. Short range is 5km with a 4-meter whip antenna, or 14 km with a 10-meter telescopic antenna (usable only when the vehicle is stationary). Weight: 45 kg; Price: \$1,600

R-130 Vehicular Radio: The R-130 is primarily installed in Russian command vehicles. It has a short range of 13km with a 4-meter whip antenna, 19 km with a 10-meter whip, or 88 km with a mast antenna. Weight: 44 kg; Price: \$10,000

R-148 Manpack Radio: This small radio is issued to Russian company commanders and staff officers in airborne and motorized rifle units. Controls and readouts are simple and easy to read and use quickly. Short range is 1.25 km. Weight: 3 kg; Price: \$625

R-154-2M Vehicular Radio: This Russian radio is primarily issued to reconnaissance and command vehicles. It consists of an HF radio, an AM long-range radio, and Teletype transmitter. The radio is described as "unusual and complex" to operate, but in the hands of an experienced RTO, gets good results. Short range is 12 km in the HF or Teletype mode and 100 km in the AM mode. Weight: 90 kg; Price: \$6,500

R-159 Manpack Radio: This Russian radio is widely issued throughout Pact armed forces, and can even be found in some Category 3 and Mobilization-Only units. It operates in the UHF band, and has a short range of 2.5 km with a whip antenna or 12.5 meters with a mast. The radio is also capable of passing data to computers at a speed of 16 Kbps. Weight: 9.2 kg; Price: \$1,150

R-163V (Arbalet-1V) Secure Manpack Radio: This is a more modern Russian radio, used at all levels and all categories of the Russian and Pact military. It has digital readouts and push-button controls. Radio traffic from this unit is encrypted, and the radio can download information to a computer at a rate of 32 Kbps. Short range is 2 km with a whip or 5 km with a mast. Weight: 8 kg; Price: \$4,000

R-163-10V (Arbalet-10V) Secure Vehicular Radio: This is the vehicular counterpart to the R-163V listed above. It has all the features of that radio, and can also transmit Teletype information, and has limited ECCM ability (making it harder to jam). Short range is 18 km with a whip antenna and 60 km with a mast antenna (usable only when the vehicle is stationary). Weight: 35 kg; Price: \$8,300

R-163-10K Secure Manpack/Vehicular Radio: This Russian radio is for tactical command use. It can be used for voice and telegraph operations. Range is 2.5 km when used manpacked, or 7.5 km when used in vehicular mode. Information may be downloaded to computers at a rate of 32 Kbps. Weight: 13.5 kg; Price: \$5,000

R-173 Secure Vehicular Radio: This modern radio is primarily employed by Russian and Pact Tanks. It operates in the VHF band, and has a range of 10 km with a whip and 30 km with a mast. Weight: 43 kg; Price: \$9,200

South Korean Radios

PRC-999K Secure Manpack/Vehicular Radio: This is a South Korean frequency-hopping radio. It can be made further secure by the addition of a scrambling module on a cable. When not using frequency hopping, the radio is interoperable with the PRC-77 and PRC-1077; in frequency-hopping mode, the radio is interoperable with US and US allies frequency hopping radios (such as Sincgars). Short range when manpacked is 0.3 km with a rod antenna and 5 km with a whip. Vehicular range is 25 km. Weight: 5.8 kg; Price: \$9,200

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US Radios

AM 1077 VHF Power Amplifier: This device, when linked to an AN/PRC-77 (the standard manpack/vehicular radio in the *Twilight: 2000 Version 2.2* rules), PRC 1077, or AN/VRC-12 (13 km vehicle radio in the rules), boosts range by up to 400%. To achieve this range, a standard US 3.084m whip or its equivalent, or a better antenna, must be used. (This is a normal antenna for most US vehicles.) Weight: 3.6 kg; Price: \$2,900

AM-4677B Power Amplifier: This amplifier may be connected to an AN/GRC-125, AN/GRC-160, AN/VRC-53, AN/VRC-64, AN/PRC-77, or AN/PRC-25 to boost the range of these radios by 400%. There is an AM-4677C version, designed to support certain European radios. This device includes a speaker for the radio installed. This amplifier must be run from vehicle or generator power. Weight: 2.4 kg; Price: \$2,900

AM-4700 Power Amplifier: This amplifier can work with a wide variety of radios, including most VHF radios used by US, NATO, and allied countries. It must be powered by a vehicle or generator. This device boosts range by 400%. Weight: 2.5 kg; Price: \$3,200

AM-6987/GR Power Amplifier: This amplifier is designed for AM-band UHF radios (such as those used to communicate with aircraft by FALOs). It boosts range of these radios by 770%. Weight: 38.56 kg; Price: \$5,800

AM-7175/URC Power Amplifier: This amplifier is used by FM or AM UHF radios to provide a large boost in range. It is a modern device that includes a speaker. It is normally used by aircraft and ships. This device boosts range of such radios by 15 times. Weight: 9.98 kg; Price: \$11,500 (C/-)

AM/7209(J)/VRC Power Amplifier: This device can amplify the signals of most VHF radios, including frequency-hopping radios like the US Singcars and radios equipped with scramblers such as the US AN/VRC-89. Hookup is simple, with few external controls and only a single cable connection to the radio and antenna. Signal is boosted 770%. This device requires vehicle or generator power. Weight: 7.5 kg; Price: \$7,000

AM-7238 Filter/Power Amplifier: Designed for VHF radios on standard NATO tactical frequencies, the AM-7238 combines the filtering of crosstalk between two co-located radios, and an amplifier that boosts range by 400%. This device has been produced for the US Singcars radio since 1991, and variants for European radios have been made since 1994. Weight: 5.4 kg; Price: \$3,600

AN/GRA-39A Radio Set Control Group: A normal radio transmitter must be located within a few meters of its antenna; the antenna, the actual source of the broadcasts, is easily located. Thus develops a major problem for radio operators -- keep moving, requiring a short antenna and reduced range, or take the chance of having an enemy artillery barrage sent your way, ruining your whole day. The US Army came up with a solution—the AN/GRA-39A.

This unit consists of two pieces: one is attached to the antenna and the other to the radio, connected by WD-1. This system allows both the radio and its human operator to be up to one mile from the antenna, thus removing them from danger.

To set up the AN/GRA-39A requires WD-1 along with a successful Electronics: ESY task completion. Use of this device is Electronics: ESY task. Wt: 7.5 kg Cost: \$1000

AN/GRC-103(V) Radio Relay Set: This Canadian system is in use by Canadian, US, NATO, and other armed forces. It is used to relay radio communications over longer distances than normal radios are able to communicate. This relay set is able to pass communications over a range of up to 180 km, depending on terrain and antenna used. By itself, it cannot be used to hear or send radio calls, but instead passes calls to other radios. Weight: 61.5 kg; Price: \$20,800

AN/GRC-106A Vehicular/Ground Radio: This radio is normally employed in a fixed station, but may be mounted in a vehicle. It operates in the low HF-range, and ground-to-ground communication is 20 km. Ground-to-air communication is 600 km. The radio requires a 4.57-meter antenna and either vehicular or generator power. It can be coupled with a scrambler. Weight: 51.7 kg; Price: \$10,000

AN/GRC-206(V) Vehicular/Ground Radio: This radio is normally used in a ground station, but may be vehicular-based. Functions and controls are monitored by a microcomputer. The radio operates in either HF, VHF, or UHF ranges and in the FM or AM bands. The radio was specifically designed to be mounted in a Jeep or M-113 APC, but is adaptable to other vehicles with ease (in the US Army, they are often mounted in HMMWVs). Two persons may use this radio at once. The AN/GRC-206(V) may be remote controlled by wire from up to 3.3 km away. A scrambler may be added by use of a cable attachment. This radio is often employed by US special operations units and on US Air Force special operations aircraft. Short range is 30 km, 35 km, or 150 km, depending on

antenna used. Weight: 14 kg; Price: \$8,300

AN/GRC-213A Vehicular Radio: This radio was first issued to US units in 1983, and is based on the HF AN/PRC-104 manpack radio. The AN/GRC-213 adds an amplifier and a vehicle mounting rack. The radio is capable of burst transmissions and data transfers at the rate of 15.3 kbps. Short range is 20 km. Weight: 19.5 kg; Price: \$2,300

AN/GRC-233 Special Operations Communications Assemblage V1 (SOCA V1): This is a large radio meant to be powered from a vehicle, portable generator, conventional generator, or commercial power outlets. The radio set includes a lightweight portable generator, a scrambler, a vertical satellite beamer (SATCOM), a fax machine, and connections to transmit voice, data and video transmissions (the latter two at a rate of 16 kbps). The radio includes interface equipment for commercial telephone networks, field telephones, military and civilian fax machines, military and civilian keyboards, computers, and antijam equipment. The set can be configured by a competent operator for any mode in less than five minutes. Operation is in the UHF range, and either the FM or AM bands. Range for ground-to-ground communications is up to 30 km short range, depending on antenna used, and range for ground-to-air communication is 600 km. Satellite transmission range is potentially infinite. The assemblage comes in 4 cases. Weight (each case): 31.5 kg; Price (Complete): \$145,000

AN/GRC-226 Vehicular Radio: This is an older Canadian-built radio in use by NATO forces and several other allied countries. It has a short range of 10 km when using a mast antenna. Weight: 36 kg; Price: 1,150

AN/GRC-238(V) Vehicular/Ground Radio: This radio combines two AN/PRC-139 hand radios, an amplifier, and an interface box into a single radio able to communicate over longer ranges than the base radios. The lid of the container contains an input panel with push-button controls, LED readouts, and a speaker. A handset and a headset come with the radio. Short range is 5 km, 16 km, or 40 km, depending on antenna used, or 2 km without an antenna. The AN/GRC-238 (V) may use either the VHF or UHF band. A scrambler is included with the AN/PRC-139s. The component AN/PRC-139 radios may be removed and used separately if desired, but the amplifier will not function unless both radios are in the interface box. Weight: 6.3 kg; Price: \$1,820

AN/GRC-512 Vehicular Radio: This radio has ECCM (Electronic Counter-Countermeasures) features to allow it to continue operating in an environment where radio communications are being jammed. It is a frequency-hopping radio, and can also be used to allow computers to communicate with its built-in modem. The AN/GRC-512 can also be used as a relay set and may be operated by remote control. Short range is 15 km. Weight: 27 kg; Price: \$8,500

AN/PRC-104 Manpack/Vehicular/Ground Radio: This is an HF radio used for communicating with ground units and air units. It is a small, yet powerful radio that marked the first use of Large-Scale Integrated (LSI) circuits in a military radio. The radio has a short range of 8 km ground to ground and 100 km ground to air in the manpack mode; in the vehicle-mounted version (known as the AN/MRC-138) with a range of 50 km/300 km, and a ground-mounted generator-powered base station (known as the AN/GRC-193) with a range of 400 km both ground to ground and ground to air. These radios may be used with a scrambler. These radios are used by the US Air Force, Navy and Marines (Reserve forces), as well as New Zealand, Sweden (reserve forces), Spain, and some countries in the Middle East, Africa, and Far East. Weight: (AN/PRC-104) 6.4 kg, (AN/MRC-138) 10 kg, (AN/GRC-193) 15 kg; Price: (AN/PRC-104) \$670, (AN/MRC-138) \$4,200; (AN/GRC-193) \$7,100

AN/PRC-112 A Secure Transponder: This radio is more a survival radio than anything else; it operates on only 8 frequencies on the UHF/AM band, including the international emergency band. There is a newer version, the GPS-112, which adds a GPS (Global Positioning System) receiver. Short range is 4 km. Weight: 0.8 kg; Price: (AN/PRC-112) \$1,300, (GPS-112) \$3,300

AN/PRC-117A Secure Manpack Radio: This is a first-generation frequency-hopping radio, first fielded in 1982 by US special operations forces. It has since been superseded by the Singcars radio, but is still used by reserve special operations units. It may be used with a scrambler. The frequency hopping also adds ECCM capability. In clear net mode, it may communicate with all other US, NATO, and allied VHF/FM-band radios. The AN/PRC-117A may also be used as a repeater. Short range is 10 km. Weight: 5.8 kg; Price: \$3,300

AN/PRC-117B(C) Secure Manpack Radio: This is an AN/PRC-117A with an integrated Vinson scrambling module. Weight: 6.9 kg; Price: \$5,300

AN/PRC-117D(C) Secure Manpack Radio: This radio is a VHF/UHF AM/FM version of the PRC-117B(C), used by FALO teams and to communicate with other aircraft. This radio is also used by the CIA, NSA, and other clandestine government agencies. Range is 10 km in ground-to-ground mode and 80 km in ground-to-air mode. Weight: 6.86 kg; Price: \$9,300

AN/PRC-119 Singcars Secure Manpack Radio: This is the standard manpack radio of US forces and some allied countries, such as Israel. This unit has a built in frequency-hopping unit. Any radio can communicate with any other by means of a special frequency-hopping unit that changes frequency (all 2300 of them) at 30-second intervals so that it is almost impossible to listen in on a

conversation for any long period of time. However, both radios must be on a same link to be able to communicate. The AN/PRC-119 may also be used as a modem, transmitting and receiving data at a rate of 16 kbps. The Singcars Manpack may be combined with a Vinson scrambler for maximum security. This radio has a maximum range of about 8km as a manpack radio. Wt: 7.5kg; Price: \$4000

AN/PRC-126 Hand Radio: This is a VHF/FM-band squad-level radio. This radio normally operates in the 30-88 MHz range, but the US Air Force version, the AN/PRC-128 Scope Shield, can use either the 30-88 MHz range or 130-174 MHz range. It is used by security teams at US Air Force bases. Short range is 1 km. Weight: 1.17 kg; Price: \$500

AN/PRC-130 Secure Manpack/Vehicular Radio: This is an HF radio with a frequency-hopping module and an optional encryption module (not included with the basic radio). Short range is 5 or 20 km with the manpack version, and 50 km with the vehicle mounting. This radio is in limited use by US forces, used to fill the gap when Singcars production could not meet demand after the Twilight War began. Weight: (manpack) 6.4 kg, (Vehicle mount) 10.4 kg; Price: (Manpack) \$6,700; (Vehicle mount) \$16,700

AN/PRC-132 Manpack Radio: This small-but-powerful radio was designed for US Navy SEAL teams, Special Forces, and Delta units. 80 channels may preprogrammed into its memory, and add-in cards may be used to give modem capability or to expand available frequencies. A scrambler may be added with a cable. Range is 5, 10, 20 or 50 km depending on antenna used. Weight: 5 kg; Price: \$1,770

AN/PRC-139 Hand Radio: This radio operates over either the 30-88 MHz, 136-174 MHz, or 403-470 MHz bands, depending on what transceiver is installed. (Changing transceivers is a task requiring a Phillips screwdriver and no special skills.) It features an embedded Vinson (scrambler) module. The radio may also function as a modem, at a data rate of 16 kbps. This radio is in use by most US forces, particularly the US Army and Air Force. Short range is 2 km. Weight: 1.35 kg; Price: \$1,000

AN/PRC-140 Saturn Secure Manpack Radio: This radio is the replacement for the Singcars system, but as production had just begun as the Twilight War commenced and production facilities were not in full operation, it is relatively rare. The radio features fast frequency hopping, and can be used with a scrambler to provide extra security. It may also transmit in the UHF and VHF bands, in both the AM and FM mode, to ensure a wide variety of applications. It is virtually impossible to jam the Saturn or break into its nets, since frequency hopping is so fast and the radio may send out signals to block out other radios if they are captured. Hopsets and codes can only be retrieved from the radio with a special procedure; if that procedure is not followed exactly, the radio destroys any hopsets and codes programmed into it. Short range is 2 km with a short rod antenna or 10 km with a whip. Weight: 5.85 kg; Price: \$4,000

AN/PSC-5 Manpack/Vehicular SATCOM Terminal: This device, when linked to a portable satellite downlink subsystem or a vertical satellite beamer (see below), allows communications via satellites in orbit. Normal transmission mode is voice, but a keyboard may be attached for text, as can a fax machine or a computer. The device may also be used as a regular radio, with a short range of 18 km. It may be used as a beacon for rescue or other homing operations. Weight: 7.5 kg; Price: \$6,000

AN/TRC-199(V) Tactical Repeater: This is a radio repeater based on two AN/PRC-139 radios in a case with an amplifier and rebroadcast equipment. The two component AN/PRC-139 hand radios may be removed and used as normal, but the rebroadcast feature of the device will not work unless both AN/PRC-139s are in their cradles. Short range for rebroadcast is 2 km, 10 km, or 40 km, depending on antenna used. A scrambler may be added. Weight: 25.4 kg; Price: \$4,300

AN/URC-101 Manpack SATCOM Radio: This is a self-contained satellite communications system (terminal, antenna, and transmitter are contained in the same unit. The unit transmits either AM or FM voice or data and in the high VHF or standard UHF bands, and can also be used as an emergency locator beacon. It may also be used as a normal radio, with a range of 5 km in the VHF band and 20 km in the UHF band. The AN/URC-100 is scrambler-compatible. The radio transmits in a 60-degree arc using a hand-held antenna. Weight: 7.26 kg; Price: \$6,700

AN/URC-111 Manpack Radio: This radio was designed for point-to-point transmissions. It uses a hand-held antenna to transmit in a 60-degree cone, providing the enemy less chance to intercept the signal. It is otherwise similar to the AN/URC-101 radio listed above, but was designed to operate in the standard NATO VHF tactical band (30-88 MHz). It may also use the 225-400 MHz UHF band for communication with aircraft. Range is 5 km in the VHF band and 20 km in the UHF band. A scrambler may be attached to this radio. Weight: 7.7 kg; Price: \$6,250

AN/URC-120 Manpack Radio: This is the HF counterpart to the AN/URC-111 listed above (though it is not merely a modified version of that radio). It is used for long-range directional communications, with a short range of 100 km. Weight: 8.6 kg; Price: \$31,000

AN/TLG-17B Radio Jamming System: The AN/TLG-17B is a high-powered radio and radar jamming system. It is capable of

jamming multiple frequencies of radio waves. In order to successfully use this equipment, the operator is required to pass an Electronics: AVG task check. The operator of the jammed radio or radar must then pass a Electronics: DIF task in order to continue operating on the same frequency. This unit requires 550 watts of power to operate and has the effective range of 50 kilometers. Wt: 100 kg (including generator) Cost. \$25,000

AN/VRC-86 Vehicular Radio: This is an HF-band radio used for long-range communications from wide-ranging vehicles or by command elements. It entered US service in 1985. The radio may be combined with a Vinson scrambler or a GPS system to receive or transmit position updates. Special transmission filters allow it some ECCM protection. Short range is 150 km. Weight: 27.2 kg; Price: \$17,300

AN/VRC-87C Singcars Secure Vehicular Radio: This is the standard vehicular radio of US forces and some allied forces, such as Israel, Kuwait, and Saudi Arabia. This radio has a short range of about 50km from a vehicle only. This unit has a built in frequency-hopping unit. Any radio can communicate with any other by means of a special frequency-hopping unit that changes frequency (all 2300 of them) at 30-second intervals so that it is almost impossible to listen in on a conversation for any long period of time. However, both radios must be on a same link to be able to communicate. A Vinson scrambling module may be added for maximum security. Wt: 12kg; Price: \$3500

AN/VRC-91A Singcars Secure Manpack/Vehicular Radio: This is a version of the US Singcars radio. This radio has a short range of 8km/35km. It can be man portable or mounted in a vehicle. This unit has a built in frequency-hopping unit. Any radio can communicate with any other by means of a special frequency-hopping unit that changes frequency (all 2300 of them) at 30-second intervals so that it is almost impossible to listen in on a conversation for any long period of time. However, both radios must be on a same link to be able to communicate. A Vinson scrambling module may be added for maximum security. Wt: 7.5kg; Price: \$3000

AN/VRC-92A Singcars Secure Vehicular Radio: Vehicular powered, dual channel (two radios in one) radio that can hold two separate conversations at the same time. It has a short range of 50km. This unit has a built in frequency-hopping unit. Any radio can communicate with any other by means of a special frequency-hopping unit that changes frequency (all 2300 of them) at 30-second intervals so that it is almost impossible to listen in on a conversation for any long period of time. However, both radios must be on a same link to be able to communicate. A Vinson scrambling module may be added for maximum security. Wt: 20kg; Price: \$5000

AN/VRC-94A Secure Vehicular Radio: This radio comes from the generation of frequency hopping radios one generation before the US Singcars family of radios. Total frequency range available in this radio is 30-90 MHz, but the radio may conduct frequency hopping receiving and transmitting only when in the 30-60 MHz range. The base receiver/transmitter of this radio is the same as in the AN/PRC-117A manpack radio. This radio may be made further secure by the addition of a scrambler/descrambler. Short range is 50 km. Weight: 21.3 kg; Price: \$23,000

AN/VRC-94D Secure Vehicular Radio: This is a version of the AN/VRC-94A (see above) that can operate in the VHF or UHF band, in AM or FM mode. It allows communication with other ground units, ships, and aircraft. Weight: 21.3 kg; Price: \$24,000

F-200 Co-Site Filter: This small device prevents crosstalk caused by having more than one radio in close proximity to each other (such as in the same vehicle) in the same frequency band and operating frequencies close to each other. Each F-200 may insulate two radios. Weight: 2.93 kg; Price: \$400

Joint Advanced Special Operations Radio System (JASORS) Secure Manpack Radio: This is the next-generation radio, slated to replace Singcars with US special operations units and agencies like the CIA, NSA, and DIA. The JASORS radio has a short range of 24 km and can be used with portable satellite uplink subsystem (see below). It is a frequency-hopping radio, and a scrambler may be added for additional security. Other devices that may be attached include keyboards, a digital camera, fax machines, computers, and various amplifiers. The JASORS includes a modem with a speed of 24 kbps, a transponder, and an optional directional antenna that transmits and receives only in a 60-degree cone. The JASORS has the ability to lock out of a radio net radios that have been captured. Few of these radios were produced before the factory was torched by rioters in 1998. Weight: 6.8 kg; Price: \$8,000

KDT-882A Ground-To-Air Radio: This Chinese radio is used by airborne and airmobile troops to communicate with aircraft. It is also used by Chinese FALO teams to coordinate air strikes. It consists of an AM and FM radio. Ground to air short range is 9km, and short-range ground-to-ground communication range is 6 km. Weight: 9 kg; Price: \$2,100

Leprechaun Secure Hand Radio: This is the squad-level member of the Singcars radio family. It is a frequency-hopping radio with an integral Vinson scrambler/descrambler module, includes a 16 kbps modem, and a GPS receiver may be added via a cable to transmit and receive instant location updates. The Leprechaun is derived from the AN/PRC-139 (see above). Short range is 5 km. Weight: 1.4 kg; Price: \$2,500

Miniature Secure Hand-Held Radio (MSHR): This pocket radio uses a scrambler to provide secure communications. Used by the FBI, the MSHR is interoperable with military UHF radios. It will continue working even if immersed in water. Short range is 2.5 km. Weight: 0.28 kg; Price: \$1,250

MP-25 Manpack Radio: This simple radio operates in the low HF range using the AM and FM bands. It is not used by US forces, but is instead exported to several Asian, African, and South American countries. It can use a large variety of headsets and handsets, and accessories such as solar battery chargers and encryption modules. Short range is 25 km in FM mode and 10 km in AM mode. Weight: 4.3 kg; Price: \$2,100

PH-26 Phantom Secure Hand Radio: This radio is designed for shot-down aircrews to contact rescue forces. It gives the pilot over 4,000 frequencies to work with, and secure communications by means of frequency hopping. It operates in the UHF FM band. Short range is 5 km. Weight: 0.59 kg; Price: \$2,500

PR 1605 Hand Radio: This radio is waterproof, and functions (to a limited extent) underwater. Range underwater is in a 100-to-1 ratio: 1 meter underwater uses the equivalent of 100 meters of signal strength above water, so that an operator 10 meters underwater would use up 1 km of range just to get the signal out of water. Naturally, diving gear with special facemasks and voicemitters must be used when underwater to use this radio. It operates in both the VHF and UHF bands, and thus ground radios, ships, and aircraft can be contacted. This radio is used by US special operations forces, the US Marines, the Portuguese Navy, and other unnamed foreign forces. Weight: 1 kg; Price: \$2,000

RC-292 Antenna System: The RC-292 is a 10-meter-tall radio antenna. The radio attached to this antenna has its broadcast range tripled in normal mode or multiplied by six in high-power—thus highly detectable—mode. The antenna is non-mobile and takes one man-hour to assemble (i.e., one man takes one hour, two men take one-half hour, four men take one-quarter hour, etc.). In addition, it takes one-half man-hour to disassemble. Both assembly and disassembly require a successful Intelligence: ESY task completion. This antenna broadcasts in 360 degrees for purposes of reception and detection. Wt: 10kg; Cost \$1000

RC-585 Antenna System: The RC-585 is identical to the RC-292 except the RC-585 only broadcasts on a 90-degree arc—thus making it harder to detect. It takes an additional one-half man-hour to erect. Wt: 13kg Cost: \$1500

SB-22/PT Field Switchboard: This switchboard is designed to be a compact, rugged battery-operated, self-contained unit capable of handling up to 22 separate telephone lines. Setting up the unit requires WD-1 to be run to serviced telephones and a successful Electronics: ESY task completion. An Intelligence: ESY task is necessary each period to successfully operate this unit. Wt: 7.5 kg Cost: \$600

TA-1 Field Telephone: Requires commo wire to link it to other field telephones. Secure unless the wire is tapped. Includes 30m of commo wire. Sound-powered. Wt 3kg; Price \$100

TA-312/PT Field Telephone: This small, rugged, battery-operated, field telephone is quite common in US Army field organizations. It is used, for the most part, in areas where units are planning to stay for an extended period of time. The field telephone unit consists of a handset, as well as a box-like base that has a hand crank.

To set the unit up requires WD-1 telephone line (commo wire), run to a switchboard or destination phone, and an Electronics: ESY task completion. Wt: 2.5 kg Cost: \$250 (C/S)

TA940B Power Amplifier: This device may be attached to British-designed, US, or NATO HF-band radios to boost range by 770%, or to boost AM radios by 200%. It must be powered by a vehicle or generator. Weight: 8.6 kg; Price: \$5,800

TA944 Power Amplifier: This newer amplifier superseded the TA940B in NATO service. It has the same capabilities as the TA940B. Weight: 5.9 kg; Price: \$6,000

TA4044B Power Amplifier: This amplifier is used in the same way as the above two amplifiers, but adds support for VHF radios (the normal band used by most military radios, such as those listed in the *Twilight: 2000 Version 2.2* rules). It cannot be used for AM radios, but will boost range of HF and VHF radios by 770%. Weight: 15.5 kg; Price: \$5,800

Generic Radio Equipment

Antenna, 500km: A wire antenna used to rig field-expedient antennas and a half a dozen resistors and insulators. Rigged from trees or other supports and grounded, the antenna alone will triple the radio's range. When used in conjunction with a generator, the full range may be reached. Weather and terrain will affect the range of the radio when using these antennas. Wt 3kg; Price \$100

Commo Wire: Has a myriad of other uses other than for communications. 300-meter roll. Wt 3kg; Price \$25

Cellular Telephone: A portable cellular phone allowing access to cellular communications networks. Wt: 1 kg; Price: \$800

Expendable Jammer: This is a compact, disposable electronic jamming unit. Once activated, the jammer operates continuously for 2 hours, overpowering any transmitter or receiver within 20 meters and requiring operator checks within 40 meters. Once set, the jammer can be programmed to delay activation for up to 100 hours, in one-minute intervals. Weight: 2.25kg; Price: \$4000

Field Sound Processor: Roughly the size of a small briefcase, the field sound processor (FSP) is packed with electronics, allowing the user to record audio inputs and perform real-time analog processing at the same time. Capabilities include a high-gain/low-noise amplifier, speech passband filter, compressor, and equalizer. Essentially, this means the unit is able to take in a weak signal and boost it to within a set range to filter out all noise beyond the human speech range, and to improve the quality of the sound within that range. To work properly, this requires the skill of Electronics

Current Tech: Current tech FSP gear is as described above. The unit runs on a set of rechargeable 9.6V batteries, with duration of seven hours before recharging. This item must be custom built. Wt: 7kg; Price \$850

Hi-Tech: No new features, aside from smaller size and manufacture from government contractor. This unit is available only to government personnel. Wt: 5kg (about the size of a handbag).

Frequency-Hopping Radio: This radio resists jamming and interception by shifting among several preset frequencies at preset intervals (usually several hundred per second). Unless a listener knows the frequencies and intervals, he cannot remain locked onto the signal. All sets in a system must be synchronized in order to communicate, but this can be accomplished by any of the radios in the loop at a predetermined time using an electronic key coder. Weight (radio) 5kg (coder) 0.5kg; Price (radio) \$800 (coder) \$500

Global Positioning System (GPS) Receiver: This is a small, handheld, Global Positioning System (GPS) receiver featuring selective availability/antispoofing and antijam capability. It provides precise positioning and timing solutions based upon signals received from the GPS satellite constellation. It is a five-channel receiver, capable of Precision Code (P-Code) and Y-Code (encrypted P-Code) reception. Positioning solutions can be displayed in latitude, longitude, military grid reference system, Universal Transverse Mercator, British National Grid, and Irish Transverse Mercator Grid coordinates. It contains 49 map datums, and can be programmed to support navigation. The GPS has a built-in test feature, and is night-vision goggle compatible. The GPS is accurate to within 10 meters. Note: In T2000, satellite availability is spotty at best, since many have been shot down. Weight: 1.3kg; Price \$3000

GPS, Commercial: This is a civilian version of the military GPS described above. It has no encryption or antijam capability, widely varying map availability (some are actually better in this regard than military versions), and are accurate to within only 100 meters. Weight: 0.3kg; Price \$2000

Individual Tactical Radio: A small radio of limited range (one kilometer) designed to be used by small groups who require precise coordination and hands-free operation. The radio consists of a voice activated throat mike (strapped in place over the larynx), a headset with bone-conduction earphones, and a battery case (usually carried in a shirt pocket). This radio is hands-free and allows the wearer to hear more-or-less normally when in use. The set also incorporates a manual "beeper" button; enabling Morse signals to be sent if the sender does not want to speak. These are relatively sophisticated radios and are more expensive than the normal walkie-talkie. Wt: Negligible; Price: \$550

Portable Facsimile Machine: Connected to a radio, this enables recon photos, situation maps and other reports to be sent and received by units in the field. Wt: 6 kg; Price: \$1800

Portable Fax Machine: Connected to a phone, portable phone, computer or satellite downlink system, this enables documents to be sent and received (or just printed out in the case of the computer) in remote locations. Wt: 6 kg; Price: \$1800

Portable Satellite Downlink Subsystem: An antenna system permitting radio communication via geosynchronous satellite with practically any location in the world when linked into a proper radio in place of the normal antenna. It requires five minutes to erect and align, and two minutes to completely dismantle. Wt: 4 kg; Price: \$12,000 (R/S).

RF Emitter: The RF emitter can create RF emissions at frequencies set by the user. This is most commonly used for jamming other devices, especially communications devices. However, the RF emitter has several advanced uses—
DIF: Electronics to succeed—such as jamming microprocessors, video screens and microprocessor-controlled equipment. Success means that the equipment is jammed and inoperable. Range for such jamming is limited to the strength of the emitter, but for the models shown below is 200 meters.

This is a hand-held unit with an integral transmission antenna and an LCD display showing current frequency. This device is

available to any civilian in a Western nation, but spraying RF emissions without regard for radio communications guidelines is illegal in all jurisdictions. Wt: 1 kg; Cost: \$200.

RL-37 Reel Unit: This sawhorse-looking device allows the rapid and mobile deployment of the one-mile reel of WD-1. This unit can be stationary mounted, drawing the wire out from the central location, or mounted on the back of an open vehicle, allowing the laying of lengthy segments of wire rapidly. Wt: 8 kg; Cost \$100

Scrambler/Descrambler: Used with a telephone or voice radio unit, this scrambles conversation to seemingly random noise at the transmitter and back to conversation at the receiver. A sophisticated computer analysis can descramble a particular conversation within hours and, once the scramble pattern is known, can be used to program a scrambler with a similar pattern. Wt: 1 kg; Price: \$2000

Trail Bug: This is little more than a powerful hidden microphone. The trail bug is silver-dollar-sized and 13mm thick, and is normally hidden on a vehicle in order to track it. Once activated the device will function for 10 weeks, and can be tracked at a range of 8km in an urban or mountainous environment, or up to 30km in open country. A character with skill can read the trail bug at 12km/40km (AVG: Electronics) or 15km/50km (DIF: Electronics). Weight: 0.5kg; Price: \$300

Transponder: Special radio transmitter designed to broadcast a specific signal at a specific frequency to provide a homing beacon for pickup aircraft, radiation homing missiles, etc. The device has a one-kilometer range without an antenna, which extends to 10 kilometers with an antenna. Its internal battery will power the broadcast for 18 hours and can be started with an internal timing circuit up to 72 hours after emplacement. Wt: 1 kg; Price \$1800

Transponder, Encrypted: As the above, with encrypted burst-mode transmissions and IFF (Identification Friend or Foe) interrogator. The US AN/PRC-112(V) is an example. Weight: 0.2kg; Price \$2500

Vertical Satellite Beamer: This device resembles a portable satellite downlink system, but is an infrared laser transmitter, allowing transmission only to orbiting satellites equipped with laser-receptors. The transmission beam is only visible to IR vision gear. It takes five minutes to set up and two minutes to take down. Wt: 12 kg; Price: \$35,000

WD-1 Telephone Line: This line is highly useful for a wide variety of purposes, including, but not limited to, the laying of telephone lines. It is also used in wiring remote electronic detonators, claymore mines, or trip wires—or simply stringing something up. The cost of the wire includes a linesman set—a leather belt pouch containing a set of wire cutters/strippers, a roll of electrical tape, and a pocketknife. The WD-1 comes in three size reels—one mile (1609m), one-half mile (805m), and one-quarter mile (402m). Weight: (1 mile) 22 kg (1/2 mile) 10 kg (1/4 mile) 5 kg; Cost: (1 mile) \$200 (1/2 mile) \$75 (1/4 mile) \$35 (all)

Wind-Up Radio: Though first placed on the US market in the mid 1980's, sales of these items took off only in the mid-1990s as many models came to the worldwide market. It is a standard commercial radio that can be used to pick up commercial radio stations, weather stations, and civil defense broadcasts. This radio gets its power from a wind-up magnet, the mainspring charging a Nickel-Cadmium battery. 200 cranks will run the radio for an hour, or the built-in flashlight for 35 minutes. These types of radios are not likely to be damaged by EMP. Weight: 0.8 kg; Price: \$70

HAND TOOLS & SUCHLIKE

20-molar acid: Concentrated acid (usually nitric or sulfuric). 100 grams. A small acid bottle or flask is unlikely to have any sort of blast radius, but the person hit will immediately suffer 2D6 at the location indicated and 1D6-2 for every phase after that until some sort of base material is used to work into the wound.

Tool or Implement	Weight	Range	Damage	Price
20-Molar Acid	0.1 kg	NA	2D6 (One Body Part Only)	\$250

Anvil: This is part of the basic blacksmith tools, but must be bought and handled separately. This and a small forge allows basic blacksmithing (creation of metal parts, and possibly steel implements).

Tool or Implement	Weight	Range	Damage	Price
Anvil	23 kg	NA	NA	\$1500

Blacksmith Tools: These include tongs, hammers, bending rods, engravers, etc. A basic tool set can to an extent for the same purpose, but all tasks become 2 levels more difficult. Not all blacksmithing tools can be used as melee weapons, but even the small ones or ones too weak for melee combat can be used by scumbag torturers. The stats are for the larger tools of such a set (which does not include an anvil or forge).

Tool or Implement	Weight	Range	Damage	Price
Blacksmithing Tools	20 kg	S	1D6+0.25 STR	\$300

Bolt Cutters: The small model is used to cut drop-forged steel (such as lock hasps) up to 13mm thick, or wire/rope/cable up to 25mm or chains and similar material of comparable dimensions. The Large Bolt Cutter can cut hasps of 15mm or wire rope, cable, or suchlike up to 25mm.

Tool or Implement	Weight	Range	Damage	Price
Bolt Cutter (Small)	3.18 kg	S	1D6-1 +0.5 STR	\$67
Bolt Cutter (Large)	5.44 kg	S	1D6+ 0.75 STR	\$99

Bullet Molds: One mold will allow casting of the lead bullet of one caliber of weapon. Shot is made much more simply by dropping molten lead into a bucket of water. Lead bullets are usually much worse penetrators (+1 to each penetration category), but cannot be jacketed with primitive technology such as battery electroplating. They can be crossed into Dum-Dums (by hollowing out the tip), this reduces the range by 1/2 and worsens the penetration further (+1), but increases the damage by 1 die. Gunpowder or cordite is still needed however. Making simple round-ball bullets (such as for shotguns or primitive firearms) is ESY: Gunsmith or AVG: Small Arms (Any). Round-Nose (such as non-spitzer rifle bullets and handgns) bullets can be made rolling ESY: Gunsmith or DIF: Small Arms (Any). Spitzer bullets are ESY: Gunsmith or DIF: Small Arms (Any).

Tool or Implement	Weight	Range	Damage	Price
Bullet Mold (Average)	1 kg	S	1D6	\$250

Battery Charger: Charges batteries from generator power. Generator not included. It essentially is a power converter. Some devices can be recharged directly from radio batteries -- this normally results in excellent operation for a short period of time.

Tool or Implement	Weight	Range	Damage	Price
Battery Charger	1 kg	NA	NA	\$300

Cranes: These are fixed assemblages (which have to be built into the shop) which lift and move heavy objects via electrical power. They require around 2kW/ton for everyday use, with peak power ranging in the 15Kw/ton range (usually handled by batteries). Diesel cranes can also be found, and consume fuel at the rating listed for generators of that power. They are essential for speedy replacement of large vehicle parts (engines, turrets), or moving immobilized vehicles around. A 10 Ton crane is good enough for parts and engines, a 50 Ton crane for vehicles (except the heaviest of tanks). They can also be invaluable in construction of buildings, bridges etc. Setting up a crane at a site is a Major (but Average) task for Civil Engineer, or Machinist.

Tool or Implement	Weight	Range	Damage	Price
Crane (Small or Medium)	Variable	NA	NA	\$1000-\$5000

Crucible: This holds molten metals (usually steel or copper), and can be attached to a crane to move molten metal out of the forge, and cast it into the mold in a controlled manner. The price depends on the size and how advanced the pouring technique. For \$100 you get an insulated bucket with handles, for \$5000, an industrial 500L steelcasting bucket. Price: \$100-5000 (S/S)

Tool or Implement	Weight	Range	Damage	Price
Crane (Small or Medium)	10-500 Liter	S	Small Only (1d6+STR)	\$100-\$5000

Cutting Torch: This requires acetylene and oxygen (or compressed air) tanks. Small tanks will last for 4-5 jobs, while large tanks will last 30 jobs (10 min cutting time/job). Tanks cost \$50 for a small one, or \$150 for a large one and are V/V. A new charge of fuel costs \$40/job for acetylene and \$5/job for oxygen or \$1/tank compressed air. Cutting torches and Arc welders are necessary for jury-rigging. A torch can be used as a clubbing weapon, but this is likely to damage the torch; if the torch is not lit, damage is only 1D6.

Acetylene Tanks: These come in small tanks and large tanks. On the average, large tanks will last 30 average jobs (10 minutes cutting time per job). The tanks can be used as clumsy clubs.

Tool or Implement	Weight	Range	Damage	Price
Cutting Torch	0.3 kg	S	1D6/1D6+4	\$300
Acetylene Tank (Large)	24 kg	S (-3 to Hit)	1D6 + ¼ STR	\$150
Acetylene Tank (Small)	3 kg	S (-1 to Hit)	1D6 + 1	\$50

Duct Tape: Per roll 50mm wide by 50m long. Also known as 100-mph tape (usually in the Air Force), and Duck Tape. Any color of the rainbow can be found (usually olive drab, brown, camouflage or black in military use).

Tool or Implement	Weight	Range	Damage	Price
Duct Tape	1 kg	NA	NA	\$7

Epoxy Glue: This is known by a variety of names (PermaBond, Superglue, Crazy Glue, or Cyanoacrylate, to name of a few), Per 50 gram tube, good for about 40 applications if you're careful and depending on the size of the surface to be bonded.

Tool or Implement	Weight	Range	Damage	Price
Epoxy Glue	0.1 kg	NA	NA	\$10

Entrenching Tool: Commonly known as the E-Tool in the US, Mexican, and Canadian Armed Forces, this either folds completely or leaves and handle outside the carrier, with a folding blade and pick. Whether completely folding or partially folding, they are usually carried on the gear harness or rucksack. This tool is a combination digging shovel and pick for heavier ground, but does take about 20 seconds to deploy. It can also be used as a flat "punching" implement, if it were completely folded, but is not useful for digging this way. A good entrenching implement, the E-Tool also makes an excellent hand-to-hand weapon. Includes a carrier of the appropriate type. Note that an E-Tool shovel is not as big as a standard shovel, nor is the pick; many modern E-Tools do not have a pick.

Older E-Tools tend to be larger and heavier, with the handle non-folding and extending out of the cover.

Tool or Implement	Weight	Range	Damage	Price
E-Tool (Modern)	0.75 kg	M	(Folded) 1d6+1; (Shovel) 1D6 + 1/4 STR; (Pick) 1D6+2+AMA	\$26
E-Tool (Older)	1 kg	M	(Folded) 1D6+2, (Shovel) 1D6+2 + ¼ STR; (Pick) 1D6+2+AMA	\$35

Finishing Tools: These are power hand tools for "blueprinting" parts to fit exactly into place. They are needed for using cast parts, and augment the normal tools for the machinist, to make them measure to proper tolerances. They consist primarily of an assortment of Dremel-type tools, grinders, and micrometers.

Tool or Implement	Weight	Range	Damage	Price
Finishing Tools	10 kg	NA	NA	\$500

Forge: The quality of the forge is determined by it's cost; a gas fired industrial forge from a steel foundry will run into the tens of thousands of dollars, are immobile, and need the best coal possible (charcoal will generally not get the forge hot enough; coke is what is used by modern foundries. Small experimental gas fired forges will cost \$4-5000. Primitive hand-made coal burning forges will run \$1000-\$5000 depending on size. As natural gas is as rare as can be, hardly anyone will be using gas-fired forges, but they have about twice the efficiency, and are much easier to work with. Glass-producing forges will cost 1/4 as much and cannot be developed into a

blast furnace (as this is not generally necessary). While the forge itself cannot be used as a weapon (except in cases of sabotage), the force will have a number of large tongs, pincers, and suchlike that can be pressed into use as a club if necessary, but they may be damaged as a result.

It should be impressed upon the players that acquiring the materials needed for a forge operation is difficult and the players will probably have to build one themselves. This is an (IMP: Metallurgist) undertaking.

Tool or Implement	Weight	Range	Damage	Price
Forge	\$4000-\$10000 (or more)	S (Tools Only)	1D6 + ¼ STR	\$1000-\$50000 (or more)

Glass Cutter: A small hand-held glass cutter will be able to cut glass up to 12 millimeters thick; a suction cup with an arm holding the glass cutter can be used to create a circular hole. Snipers often also carry glass cutters to cut mouseholes in windows. Contrary to popular belief, you cannot do this sort of thing with a diamond; the diamond has to be cut and polished just so and accuracy is poor. (and a standard glass cutter already is studded with diamond dust. Use as a weapon is not very effective. The glass cutter itself will gradually wear out, becoming totally ineffective after 50 uses.

Tool or Implement	Weight	Range	Damage	Price
Glass Cutter	0.1 kg	S	(1D6-2) + (1/4 AMA)	\$6

Klecker Stowaway Tools: Though I show a brand name here, this is a collection of tools available as a package and in various storage means elsewhere.

The Stowaway Tools may be in a case based on that of a hard rubber iPhone case, a deluxe double carabiner, or a single-loop quick-link. The "iPhone" case has several slots to keep handy often-used tools. The Stowaway Tools includes a belt cutter, a magnesium fire starter, a very small folding knife, a pair of pliers/large tweezers, Schlage and KwikSet key blanks, a Philips/flat-head screwdriver, tweezers, a small comb, a small, flat LED flashlight, a griffin tool, a ball-point pen, scissors, a small straight razor, a wrench, and a pocket clip (that doubles as a bottle opener). Some tools are usable as *ad hoc* weapons.

Tool or Implement	Weight	Range	Damage	Price
Stowaway Tools	2 kg	S (Tools Only)	NA	\$193
Stowaway Tools – Belt Cutter	NA	S -2	(1D6-3) + (0.1 STR or 0.2 UMA)	NA
Stowaway Tools – Folding Knife	NA	S -1	(1D6-2) + (0.1 STR or 0.2 UMA or AMA)	NA
Stowaway Tools – Key Blank	NA	S -2	(1D6-4) + (0.1 STR)	NA
Stowaway Tools – Screwdriver	NA	S -1	(1D6-2) + (0.1 STR)	NA
Stowaway Tools – Pen	NA	S -2	(1D6-3) + (0.1 STR)	NA
Stowaway Tools – Scissors	NA	S -2	(1D6-3) + (0.1 STR)	NA
Stowaway Tools – Razor	NA	S -1	(1D6-3) + (0.25 STR or AMA or UMA)	NA

Machine Shop (Basic): The shop consists of 4 basic parts: the lathe, the disk grinder, the drill press, and metal saw. The one listed here is for a small experimental shop. An Industrial set could cost up to 1 million dollars. These require at least 50Kw to operate a small shop (and up to 500Kw for industrial). To use the shop, one has to have Machinist skill, though any "shop" skill (Metallurgy, mechanic, civil engineer) will allow use at 1/2 skill level. A well run Machine shop can create practically any metal part from stock metal. These parts are handmade, rather than produced in a factory, and will take a great deal of time (and thus money) to create. However, it is the only source of new parts. Other machines can be bought for specialized jobs. These parts will be functional, but not interchangeable. A brass stamper for turning out cartridges (with different dies for each caliber) is part of the shop. Damage figures are for the various wrenches, hammers, and materiel-handling tools on scene. (One cannot pick up the machine shop and throw it at someone.)

Tool or Implement	Weight	Range	Damage	Price
Machine Shop (Basic)	600 kg (21 kW)	S (Tools Only)	1D6+ 1/4xSTR	\$25714

MultiTasker Tube: This device looks like a fat pen, and will operate as such. However, it is the extras that warrant it further attention: an M-16/M-4 front sight adjustment tool; this is replaceable with any standard hex driver socket bits. When unscrewed, the other end reveals a carbon scraper, which will reach just about any part of the chamber, upper receiver, and lower receiver. The scraper can be replaced with any number of standard screwdriver or star bits. This end can also be replaced with the complete line of Otis cleaning tools. The pocket clip doubles as a surprisingly-strong flat screwdriver. The multitasker tube is sort of a "baby" multitool.

Tool or Implement	Weight	Range	Damage	Price
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Multitasker Tube	0.25 kg	NA	NA	\$45
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Multitool: This is sort of a Swiss Army Knife on steroids. They come in several different types, amount of tools, and types of tools. Virtually all can be unfolded into a set of pliers that can be used as pincers, to pull nails, used as a wrench, etc. Some have keychain loops; others have larger rings for attachment to field gear. Still others come with a sheath that fits the folded multitool and can be attached to a belt, LBE, MOLLE gear, etc.

The template for these tools are the Leatherman series. They typically hare made of 420HC and/or 154CM steel, anodized aluminum, and carbon fiber and/or anodized aluminum handles.

Tool or Implement	Weight	Tools	Price
Leatherman Style CS	0.04 kg	420HC Knife, Scissors, Flat/Phillips Screwdriver, Tweezers, Nail File, Carabiner/Bottle Opener	\$24
Leatherman Squirt ES4 Electrician's Tool	0.06 kg	Needlenose Pliers/Wire Strippers/Wire Cutter, 420HC Knife, Scissors, Flat/Phillips Screwdriver, Bottle Opener, Wood/Metal File, Medium Screwdriver	\$27
Leatherman Style PS	0.05 kg	Needlenose/Regular Pliers/Wire Cutters, Scissors, Flat/Phillips Screwdriver, Tweezers, Nail File, Carabiner/Bottle Opener	\$28
Squirt PS4	0.06 kg	Needlenose/Regular Pliers/Wire Cutter, 420HC Knife, Scissors, Flat/Phillips Screwdriver, Bottle Opener, Wood/Metal Mile, Medium Screwdriver	\$27
Leatherman Micra	0.05 kg	420HC Knife, Scissors, Flat/Phillips Screwdriver, Ruler (12 Cm), Nail Cleaner, Tweezers, Bottle Opener, Nail File, Medium Screwdriver, Extra-Small Flat Screwdriver	\$30
Leatherman Freestyle	0.13 kg	420HC 6.6 cm Combo Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutter	\$45
Leatherman Juice SX	0.13 kg	420 HC 5.77 cm Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutter, Can Opener, Bottle Opener, Corkscrew, Phillips Screwdriver, Medium Screwdriver, Fin Key	\$60
Letherman Skeletool SX	0.14 kg	420HC 6.6cm Knife, Needlenose/Regular Pliers/ Hardwire/Regular Wire Cutter, Carabiner/Bottle Opener, Diamond-Coated File, Large Bit Driver	\$75
Leatherman Juice C2	0.13 kg	420HC 5.77 cm Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters, Can Opener, Bottle Opener, Corkscrew w/Assist, Phillips Screwdriver, Medium/Large Screwdriver,	\$64

		Small Screwdriver, Extra-Small Screwdriver	
Leatherman Skeetool RX	0.14 kg	154CM Stainless Steel 6.6 cm Serrated Knife, Needlenose/Regular Pliers Hardwire/Regular Wire Cutter, Carabiner/Bottle Opener, Large Bit Driver, Glass Breaker	\$95
Leatherman Skeetool CX	0.14 kg	154CM Stainless Steel 6.6cm Knife, Needlenose/Regular Pliers Hardwire/Regular Wire Cutter, Carabiner/Bottle Opener, Large Bit Driver	\$95
Leatherman Skeetool	0.14 kg	420HC 6.6 cm Combo Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters, Carabiner/Bottle Opener, Large Bit Driver	\$70
Leatherman Juice CS4	0.16 kg	420HC 5.77 cm Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutter, Saw, Scissors, Awl, Can Opener, Bottle Opener, Corkscrew w/Assist, Phillips Screwdriver, Medium/Large Screwdriver, Small Screwdriver, Extra-Small Screwdriver	\$84
Leatherman Juice XE6	0.2 kg	420HC 5.77 cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutter, Saw, Scissors, Can Opener, Bottle Opener, Corkscrew w/Assist, Wood/Metal File with Diamond-Impregnated End, Phillips Screwdriver, Medium/Large Screwdriver, Small Screwdriver, Extra-Small Screwdriver	\$104
Leatherman Leap	0.14 kg	420HC 5.5 cm Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters, Saw, Scissors, Ruler, Tweezers, Bottle Opener, Phillips Screwdriver, Medium Screwdriver, Small Screwdriver	\$50
Leatherman Juice S2	0.13 kg	450HC 5.77cm Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters. Scissors, Can Opener, Bottle Opener, Phillips Screwdriver, Medium/Large Screwdriver, Small Screwdriver, Extra Small Screwdriver	\$69
Leatherman Leap	0.14 kg	420HC 5.5 cm Knife,	\$50

		Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters, Saw, Scissors, Ruler, Tweezers, Bottle Opener, Phillips Screwdriver, Medium Screwdriver, Small Screwdriver	
Leatherman Knifeless Rebar	0.19 kg	Needlenose/Regular Pliers, 154CM Replaceable Hardwire/Regular Wire Cutter/Stripper, Saw, Awl w/Thread Loop, 19 cm Ruler, Can Opener, Bottle Opener, Wood/Metal File, Phillips Screwdriver, Large Screwdriver, Small Screwdriver	\$81
Leatherman Z-Rex	0.17 kg	440C Stainless Steel Indexable/Replaceable Hook-Shaped Cutters, Oxygen Tank Wrench, Carbine Glass Breaker, 1/4" Hex Bit Driver	\$24
Leatherman Tread Metric	0.17 kg	Bracelet-Shaped 17-4 Stainless Steel, 3/32" Screwdriver, 1/8" Flat Screwdriver, Carbide Glass Breaker, Cutting Hook, Pick/SIM Card Tool, 3mm Hex Driver, 4mm Hex Driver, 5mm Hex Driver, 6mm Hex Driver, 6mm Box Wrench, 7mm Box Wrench, 8mm Box Wrench, 9mm Box Wrench, 10mm Box Wrench, 11mm Box Wrench, 12mm Box Wrench, #1-2 Phillips Screwdriver, 3/16" Screwdriver, #1 Square Drive, #2 Square Drive, #3 Square Drive, Pozi-Driv #2, Pozi-Driv #3, #20 Torx Wrench, #25 Torx Wrench, #27 Torx Wrench, #30 Torx Wrench, 1/4" Socket Drive, Bottle Opener	\$185
Leatherman Tread	0.17 kg	Bracelet-Shaped 17-4 Stainless Steel, #1-2 Phillips Screwdriver, #1 Phillips Screwdriver, #2 Phillips Screwdriver, 3/32" Screwdriver, 3/16" Screwdriver, 1/8" Flat Screwdriver, 5/16" Screwdriver, 1/4" Flat Screwdriver, 1/4" Box Wrench, 3/32" Box Wrench, 3/16" Box Wrench, 3/8" Box Wrench, 6mm Box Wrench, 8mm Box Wrench, 10mm Box Wrench, 3mm Hex Driver, 4mm Hex Driver, 5mm Hex Driver, 6mm Hex Driver, 1/8" Hex Driver,	\$185

		¼" Hex Driver, 3/32" Hex Driver, 3/16" Hex Driver, Oxygen Tank Wrench, Carbide Glass Breaker, Pick/SIM Card Tool, Cutting Hook, ¼" Socket Driver, Bottle Opener, #2 Square Driver	
Leatherman Rev	0.17 kg	420HC 6.6cm Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters/Wire Stripper, Package Opener, 3.8cm Ruler, Can Opener, Bottle Opener, Wood/Metal File, Phillips Screwdriver, Medium Screwdriver, Small Screwdriver	\$35
Leatherman Sidekick	0.2 kg	420HC 6.6cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Wire Cutters/Wire Stripper, Saw, 3.8cm Ruler, Can Opener, Bottle Opener, Wood/Metal File, Phillips Screwdriver, Medium Screwdriver, Small Screwdriver	\$50
Leatherman Charge AL	0.24 kg	154CM Stainless Steel 7.37cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters/Wire Stripper, Saw, Scissors, 19cm Ruler, Can Opener, Bottle Opener, Wood/Metal File/Diamond-Coated File. Large Bit Driver, Small Bit Driver, Medium Screwdriver	\$141
Leatherman Signal	0.21 kg	420HC 6.93cm Combo Knife, Needlenose/Regular Pliers/154CM Replaceable Hardwire/Regular Wire Cutters/Wire Stripper, Saw, Hammer, Awl w/Thread Loop, Can Opener, Bottle Opener, ¼" Hex Bit Driver, Bit Driver, ¼" Box Wrench, 3/16" Box Winch, Carabiner, Safety Whistle, Ferrocium Rod, Diamond-coated Sharpener	\$100
Leatherman Raptor	0.16 kg	420HC Stainless Steel EMT Shears/5cm Ruler, Strap Cutter, Ring Cutter, Oxygen Tank Wrench, Carbine Glass Breaker	\$70
Leatherman Charge TTi	0.25 kg	Titanium Alloy Construction, S30V Stainless Steel 7.37cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire	\$171

		Cutters, Crimper, Wire Stripper, Saw, Scissors, Cutting Hook, 19cm Ruler, Can Opener, Bottle Opener, Diamond-Coated/Wood/Metal File, Large Bit Driver, Small Bit Driver, Medium Screwdriver	
Leatherman Crunch		420HC Stainless Steel Serrated Knife, Regular/Locking Pliers/Hardwire /Regular Wire Cutters/Wire Stripper, Ruler, Pin Vice, Bottle Opener, Wood/Metal File, ¼" Hex Bit Driver, Phillips Screwdriver, Medium Screwdriver, Small Screwdriver	\$111
Leatherman Rebar	0.19 kg	420HC 7.36cm Knife, Needlenose/Regular Pliers/Premium Replaceable Hardwire/Regular Wire Cutters/Electrical Crimpers, Wire Stripper, Saw, Awl w/Thread Loop, 19cm Ruler, Can Opener, Bottle Opener, Wood/Metal File, Phillips Screwdriver, Large Screwdriver, Small Screwdriver	\$61
Leatherman Charge ALX	0.24 kg	154CM 7.37cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters/Crimper, Wire Stripper, Saw, Cutting Hook, 19cm Ruler, Can Opener, Bottle Opener, Wood/Metal/Diamond-Coated File, Large Bit Driver (I), Large Bit Driver (II), Small Bit Driver	\$150
Leatherman Wingman	0.2 kg	420HC 6.6cm Combo Knife, Needlenose/Regular/Wire Cutters, Wire Stripper, Scissors, Package Opener, 3.8cm Ruler, Can Opener, Wood/Metal File, Phillips Screwdriver, Medium Screwdriver, Small Screwdriver	\$40
Leatherman Wave	0.24 kg	420HC 7.37cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Hardwire/Regular Wire Cutters, Wire Stripper, Saw, Scissors, 19cm Ruler, Can Opener, Bottle Opener, Wood/Knife/Diamond-Coated File, Large Bit Driver, Small Bit Driver, Medium Screwdriver	\$100
Leatherman MUT	0.32 kg	420HC 7.6cm Combo Knife,	\$160

		<p>Needlenose/Regular Pliers/Premium Replaceable Hardwire/Wire Cutters, Stranded Wire Cutters, Electrical Crimper, Saw, Replaceable Cutting Hook, Hammer, Bolt Override Tool, Replaceable Bronze Carbon Scraper, #8/32 Cleaning Rod/Brush Adapter, Replaceable Firearm Disassembly Punch, Carabiner/Bottle Opener, Large Bit Driver, 3/8" Wrench, Front-Sight Adjustment Accessory</p>	
Leatherman Super Tool 300 EOD	0.27 kg	<p>420HC 8.13cm Combo Knife, Needlenose Pliers/154CM Replaceable Fuse-Wire Cutters/Milspec Cap Crimper, Stranded Wire Cutters, Electrical Crimper, Saw, Replaceable T-Shank Metal Saw, Replaceable C4 Punch, #8/32 Cleaning Rod/Brush Adapter, Awl w/Thread Loop, 22cm Ruler, Can Opener, Bottle Opener, Phillips Screwdriver, Large Screwdriver, Medium Screwdriver, Small Screwdriver</p>	\$100
Leatherman OHT	0.28 kg	<p>420HC 6cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Premium Replaceable Hardwire/Regular Wire Cutters, SAW, Strap Cutter, #8/32 Cleaning Rod/Brush Adapter, Can Opener, Bottle Opener, Oxygen Tank Wrench, Phillips Screwdriver, Large Screwdriver, Medium Screwdriver, Small Screwdriver</p>	\$90
Leatherman MUT EOD	0.32 kg	<p>420HC 7.6cm Combo Knife, Needlenose/Milspec Cap Crimper/154CM Replaceable Fuse-Wire Cutters, Stranded Wire Cutters, Electrical Crimper, Saw, Replaceable Cutting Hook, Hammer, Bolt Override Tool, Replaceable C4 Punch, Replaceable Bronze Carbon Scraper, #8/32 Cleaning Rod/Brush Adapter, Carabiner/Bottle Opener, Large Bit Driver, 3/8" Wrench, Front Sight Adjustment Accessory</p>	\$170

Leatherman Super Tool 300	0.27 kg	420HC 8.13cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Premium Replaceable Hardwire/Wire Cutters, Stranded Wire Cutters, Electrical Crimper, Wire Stripper, Saw, Awl w/Thread Loop, 22cm Ruler, Can Opener, Bottle Opener, Wood/Metal File, Phillips Screwdriver, Large Screwdriver, Medium Screwdriver, Small Screwdriver	\$81
Leatherman Surge	0.34 kg	420HC 7.87cm Knife, 420HC Serrated Knife, Needlenose/Regular Pliers/Premium Replaceable Hardwire/Regular Wire Cutters, Stranded Wire Cutters, Electrical Crimper, Wire Stripper, Saw, Scissors, Awl w/Thread Loop, 19cm Rulers, Can Opener, Bottle Opener, Wood/Metal/Diamond-Coated File, Blade Exchanger, Large Bit Driver, Large Screwdriver, Small Screwdriver	\$105

Lockpick Set, Electronic: Used to "read" combination and electronic locks; when turning or manipulating the lock, a readout will give the user the combination or a rough idea of what kind of tools he needs, giving him a difficulty level bonus of one. Requires batteries.

Tool or Implement	Weight	Range	Damage	Price
Lockpick Set, Electronic	0.5 kg	NA	NA	\$500

Parachute Cord: Also known as 550 Cord (each strand is able to bear 550 pounds, or 250 kilograms). It is just an infinitely-useful item, used to tie people up, tie equipment on and in vehicles, tie together kit, making a garrote, and help construct shelters. Inside the 550 cord are seven smaller strands, useful for sewing thread. The 550 Cord featured here is a 30-meter hank of cord.

Tool or Implement	Weight	Range	Damage	Price
Parachute Cord	0.3 kg	NA	Special	\$27

Reloader Kit, Tabletop: This machine makes it possible to reload 40 shots per hour, packaging the propellant and primers, as well as insuring the proper neck and shoulder are on the cartridge. The machine does not make bullets, however, though it will seat them. Includes a small analogue or digital computing device to ensure the proper data is applied to the cartridge.

Reloading Bullets: Enough bullets for 350 shots. These are ready-made bullets, already made in a bullet mold (above). The price will depend upon the size of the bullet, with a .22 Long Rifle at the small end and a 14.5mm KPV at the high end. These may be thrown as a distraction tactic, but are not weapons per se. One could also use them to manually insert into a victim, if you're such a badass you can do something like it. **These measurements are very rough.**

Reloading Powder: Enough propellant for 350 shots, more or less depending upon the amount of propellant necessary to fire the bullet in question. It generally cannot be used as a weapon, but it could conceivably be thrown in an opponent's face to blind them (DIF: Thrown Weapon).

Reloading Primers: Enough primers for 350 shots. This is more or less constant, except that the primers may be rimfire or standard primers, or Berdan primers.

Tool or Implement	Weight	Range	Damage	Price
Reloader Kit, Tabletop	20 kg	NA	NA	\$2000

Reloading Bullets	3-15 kg	NA	NA	\$25-\$125
Reloading Powder	5-18 kg	NA	NA	\$150
Reloading Primers	10 kg	NA	NA	\$250

Sandcasting Setup: Rather than one fixed product, this represents the gathering of all the materials in order to do sandcasting, it includes braces, a clean supply of sand, adhesive, and clamps. Once an object has been created, it can be cast by placing it (or a wax copy) in sand, and hyper compressing the sand around it (or melting the wax out). A crude copy (unfinished) can be made then by pouring molten metal into the mould. This is the fastest way of making most complicated parts, and is also called Drop Forging when used for smaller parts. The parts then have to be annealed, and finally finished. The picks and crowbars used to remove the sandcaster shape; they are also what is referred to in the Range and Damage figures.

Tool or Implement	Weight	Range	Damage	Price
Sandcasting Setup	500 kg	M	1D6+STR	\$1000

Small Arms Cleaning Kit: These kits are normally tailored to the weapon, though the kit of a weapon of one caliber can often be used on another. It generally consists of a collapsible cleaning rod, an eyelet tip used to pull or push a cleaning patch down the bore, a bore brush for the rifle and a larger brush to clean the chamber. Some 10-25 cleaning patches are also in the kit. Many troops have added other items, such as a paper clip, a straight pin, and suchlike that they have found useful. These are usually in a small canvas or plastic case, which in many military service rifles fits in a compartment in the stock.

Tool or Implement	Weight	Range	Damage	Price
Small Arms Cleaning Kit	0.7 kg	NA	NA	\$16

Small Arms Maintenance Tool: This tool folds into a small multitool-like package (but a bit smaller). Its primary use is to remove carbon buildup from hard to reach areas. It does not replace the Small Arms Cleaning Kit for things like cleaning bores, chambers, and suchlike. Most types of small arms (assault rifles, submachineguns, battle rifles, pistols, revolvers) have a maintenance tool made for them, but one must usually buy them themselves; they are not issued by most armies. Tools include a set of needle-nose pliers, a carbine cutter, a carbine glass breaker (it may be used for other tasks), a carrier scraper, a bolt/firing pin scraper, a flash suppressor scraper, a sight scraper, a hooked pick, a short knife blade, cotter pin key with several bits, a tap hammer, a file, and 2-8 tools specific to the firearm the tool is for. The Small Arms Maintenance Toll will clean areas that the Small Arms Cleaning Kit will not, but is usually specific to an individual small arm, and has limited utility towards other small arm families.

Tool or Implement	Weight	Range	Damage	Price
Small Arms Maintenance Kit	0.91 kg	NA	NA	\$80

Survival Straps Fish Tail: This is about 4.26 meters of strengthened 550 Cord wrapped in a compact package. The end is weighted and with a fishhook, and color may be had in virtually every color. Survival Straps will replace the Fish Tail for free, regardless of age or accident. (How far this guarantee goes in TW2000 terms is unknown.) The Fish Tail comes in the form of a bracelet which can be opened to use as a fishing tackle. It could also conceivably be used as a garrote.

Tool or Implement	Weight	Range	Damage	Price
Survival Straps Fish Tail	0.5kg	S (-2 to hit)	Garrote	\$25

Swiss Army Knife: A many-bladed utility knife that folds into a small package. Includes large 57mm blade, small 40mm blade, Large screwdriver, bottle opener, wire stripper, small screwdriver, can opener, corkscrew, scissors, wood/rope saw; reamer, tweezers, plastic toothpick, key ring, fish scaler. Others exist, with more or less blades and implements; this is average one.

Tool or Implement	Weight	Range	Damage	Price
Swiss Army Knife (Large Blade)	0.1 kg	S (-2 to hit)	1D6-1	\$22
(Small Blade)	0.1 kg	S (-2 to hit)	1D6	\$22
(Assorted Tools)	0.1 kg	S (-3 to hit)	1D6-2	\$22

Spork/Can Opener: At one end is a spork, a combination of fork and spoon. As the other end is a can opener of the type you might find in a kitchen. In between is a bottle opener, pry tip, screwdriver (flat), and several metric wrench cutouts. It is a very basic multitool.

Tool or Implement	Weight	Range	Damage	Price
Spork/Can Opener	0.2 kg	S (-2 to hit)	1D6-3	\$2

Temperature-Controlled Ovens: These allow the slow cooling of metals to properly anneal newly cast metal parts. Crude

annealing will cause the part to automatically have a wear value of d10 (10 being automatic failure of the part).

Tool or Implement	Weight	Range	Damage	Price
Temperature-Controlled Oven	50 kg	NA	NA	\$1000

Wire Clippers: Clips up to 10mm wire, such as your typical razor wire, concertina, or chain-link fence. Can be used as a short, crude weapon.

Tool or Implement	Weight	Range	Damage	Price
Wire Clippers	0.5 kg	S (-1 to hit)	1D6-1	\$10

VISION DEVICES

Telescopic Sights of several types and powers are normally found on civilian hunting rifles or military sniping rifles, although they can also be found on assault rifles and battle rifles, and (much more rarely) pistols, revolvers, and auto rifles. They are almost never used on other weapons. Use of telescopic sights on auto rifles, machineguns, and grenade launchers tends to ruin the sight due to the extreme vibration encountered. Sniper rifles include the weight of a sight.

1.5x Sight: Wt 0.1, Price \$27 (R/R)

2x Sight: Wt 0.1, Price \$36 (R/R)

2-6x Sight : Wt 0.3kg, Price \$150 (R/R)

2.5x Sight: Wt 0.1, Price \$40 (R/R)

3x Sight: Wt 0.15kg, Price \$45 (R/R)

3-9x Sight: Wt 0.45kg, Price \$200 (R/R)

3.5x Sight: This is the standard sight in the game rules, and is the sight fitted to weapons such as the AUG, G-11, Colt ACR, and other such weapons with integral sights. Wt 0.18kg, Price \$47 (R/R)

4x Sight: Wt 0.2kg, Price \$48 (R/R)

4x Day/Night Sight: This telescopic sight combines both magnification and night vision. It uses light intensification for night vision. Weight: 1.45 kg; Price: \$1850 (S/R)

6x Sight: Wt 0.3kg, Price \$100 (R/R)

7.5x Sight: Wt 0.4kg, Price \$120 (R/R)

8.5x Day/Night Sight: This is a stronger version of the 4x Day/Night Sight. Weight: 2.22 kg; \$3400 (S/R)

9-12x Sight: Wt 0.6kg, Price \$350 (R/R)

10x Sight: Wt 0.5kg, Price \$250 (R/R)

12x Sight: Wt 0.6kg, Price \$275 (R/R)

20x Sight: Wt 1kg; Price \$450 (R/R)

Add-On Starlight Scope: This device is designed with the addition of a telescopic sight in mind. The telescopic sight is attached to the starlight scope, and then the starlight scope is attached to the weapon. This provides night vision equal to starlight scope, and magnification equal to the telescopic sight. Effective range at night is limited to the range of the starlight scope (450 meters). Weight: 1.46 kg; Price: \$1100 (S/R)

Add-On Image Intensifier: This is a miniaturized image intensifier first produced by Norway in the early 1990s, but soon distributed all over NATO and other friendly nations. The procedure is reversed from the above sight; the image intensifier is mounted on top of the optical sight. The resulting hybrid sight can be used both day and night. Protection is protected against blinding by explosive burst and flares. Effective range at night is limited to the range of the image intensifier (900m). Weight: 0.79 kg; Price: \$2500 (S/-)

Aimpoint Laser Sight: Allows +2 to hit when properly fitted and sighted. This device provides this modification out to a range of 100 meters. Wt 0.1kg, Price \$350 (R/R)

Infrared Aiming Light: This weapon, when properly boresighted to a weapon, provides a dot of light similar to that of an Aimpoint Laser Sight. This dot, however, is visible only to those using night vision devices. Maximum range of sight for this dot is 600 meters. These devices were first used by Coalition forces during Desert Storm. Weight: 0.13 kg; Price: \$350 (S/R)

Laser/Infrared Aiming Light: This combines the utility of the Aimpoint sight and the infrared aiming light. It can also be used underwater to a range of 20 meters. It may also be used as a flashlight. Weight: 0.25 kg; Price: \$750 (R/-)

Light Intensifier Goggles: These amplify existing light thousands of times, rather than heat emanating from objects and people. They have the same range as IR Goggles when used in the passive mode, but double their range and allow for better short-range vision clarity when used in the active mode. The drawback to active mode is that the goggles are acting as a flashlight and show up clearly to starlight scopes, IR goggles, thermal vision, and passive/active IR viewers. Weight 0.5kg; Price \$1800 (S/S)

Thermal Weapons Sight: This is a thermal vision sight designed to be mounted on small arms and heavy weapons, such as the US military's AN/PAS-13(V)2 TWS. A user of this sight can identify targets at a range of 690 meters (down to telling what type of uniform is worn, type of weapon carried, whether the target has a mustache, etc.), and larger objects such as vehicles and buildings at a range of 1000 meters. Most of these devices have crosshairs to facilitate aiming. Glass and Plexiglas are opaque to the Thermal Weapons Sight, and appear black. These sights were introduced by NATO and Israeli forces in early in 1997; as such, supplies of these sights are low, and they are hard to come by. Weight: 2kg; Price: \$4000 (R/-)

OPTICAL DEVICE	MODIFIER	MER
Iron Sights	0 Meters	500 Meters
1x Sight	4 Meters	600 Meters
1.5x Sight	6 Meters	600 Meters
2x Sight	8 Meters	600 Meters
2.5x Sight	10 Meters	750 Meters
3x Sight	12 Meters	800 Meters
3.5x Sight (Standard)	15 Meters	900 Meters
4x Sight	17 Meters	1000 Meters
6x Sight	20 Meters	1200 Meters
7.5x Sight	25 Meters	2000 Meters
9x Sight	30 Meters	2400 Meters
10x Sight	35 Meters	3000 Meters
12x Sight	45 Meters	3600 Meters
20x Sight	60 Meters	6000 Meters
Aimpoint Laser Sight	26m (Short), 20m (Medium)	200 Meters
Coincidence Rangefinder	15 Meters	Infinite
Image Intensifier	20 Meters	7000 Meters
Laser Rangefinder	30 Meters	Infinite
Laser Rangefinder with Computer	40 Meters	Infinite
Starlight Scope	20 Meters	1600 Meters
Thermal Sight	12 Meters	7000 Meters