

CYBORG COMMANDO™

SCIENCE FICTION ROLE-PLAYING GAME

Set 1: The Battle for Earth

by

Gary Gygax
Frank Mentzer
Kim Mohan



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PRODUCTIONS, INC.

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FORMAN10-1001

CYBORG COMMANDO™

SCIENCE FICTION ROLE-PLAYING GAME

CCF MANUAL



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by Gary Gygax, Frank Mentzer, & Kim Mohan

CCF Manual

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Introduction

In 1985, a space vessel landed on the moon. But it wasn't ours.

They are preparing now. They will be ready soon by their standards — in less than 50 years.

Then the invasion will begin — and succeed.

You must retake the Earth.

Welcome to the CYBORG COMMANDO™ game. This is a game of our own world, set in our very near future. For maps of the game setting, just open an atlas. For descriptions of the inhabitants, look out your window.

This is a game of science fact and science fiction. Some changes occur between now and the year 2035, the start of the game's central story. Most things haven't changed much; some things have changed a lot.

We live in the age of science. Look at the following inventions, and consider how they have changed the face of the world.

1940s: televisions and washers

1950s: polyester fabrics and transistors

1960s: cassettes and credit cards

1970s: personal computers and VCRs

1980s: digital electronics

This game assumes effects of similar magnitude for the following discoveries.

Superconductivity: Finally made practical, this basic principle changes the nature and use of electricity itself, and thereby all electrical devices on Earth.

SINC: This device is a direct interface through which brains and computers can be directly connected.

Psychogenics: This new science results from a hard, critical look at ESP and the occult. The real and provable has been separated from the fantastic and imaginary.

Combining all of those and other discoveries is your character — a member of the CYBORG COMMANDO™ Force.

How to Use this Book

There's a lot of information in this book, and you'll need to be aware of almost all of it. So take it in small chunks, and take your time absorbing the details.

First read the Preamble. This tells the

story of how the CYBORG COMMANDO™ character (or "CC"), the ultimate blend of man and machine, was invented. It also reveals much about the aliens, up until the invasion begins.

Much of the game requires using dice, so read that section next. But skip the tables and graphs, and come back to this section later, after you know when the dice are used.

Now you can create a character, as explained on pages 11-15. Start with a basic game character; *don't* tackle the Advanced game version until you've played a few games. The Advanced system offers more detail, but with it comes more complexity. The character sheet used for both is on the back cover of this booklet. Character knowledge is handled with the Skill system, starting on page 18.

Your character will be using a new mechanical body. This is more durable than the human body, and can do more things, as explained on pages 22-24. This section describes the body and abilities generally, enough to get you started; if you want the full technical details, refer to the Tech section (page 32).

Finally, the character is a member of the elite CYBORG COMMANDO Force (CCF). A few notes on this organization, and details on character advancement within it, are given on page 45.

The Other Booklets

The Campaign book in this set is for the Game Master's use. Please don't read it if you are a player! In the course of adventures, you will discover most of the details given in that booklet, but they should be revealed at the proper times and places.

If you really want to know something about the aliens presented in this game, read the section called "The Enemy," which is in the Adventures booklet. Also contained therein are a few tips to help you do your best in play. But only read your side of the Adventures booklet; the other side gives some adventure ideas for the Game Master to develop.

Game Time & Scale

For maximum convenience, the units of both time and distance used throughout the CYBORG COMMANDO™ game are based on a decimal system. The standard

time units are given in a table on the inside back cover of this booklet. In brief, they include the Combat Turn, Active Turn, Standard Turn, and Travel Turn.

To remember the names for the turns, note the initials — CAST. You'll use Combat Turns for fights, or otherwise Active Turns when timing is important. Standard Turns are used for most game activity. Travel Turns are for long-range trips, and Days are used for even longer-range campaign activity.

You can measure things by using either the Metric system or the English system. The Metric system is much more convenient, and is strongly recommended. If you aren't familiar with it, give it a try; after all, you're about to learn a whole new game, so why not use the system that goes with it best? Nevertheless, if you insist on using the archaic and unwieldy English system, you are allowed to do so. Distances are often given in undefined units; read them as either meters or yards, whichever you like. (But if you use the English system, don't blame *us* when you have to stop the game to handle the messy conversions inherent in that system.)

The standard map scales and Scale numbers are given on the same back cover page as the time units. In mathematical terms, a hex is 10^x yards across, where "x" is the scale or number of the hex size. Combat areas are normally mapped at Scale 1 or 2, though "blowup maps" might be provided at Scale 0 for even more detail. A map of an entire country would use Scale 5 or 6. A map of the solar system would probably be given at Scale 11.

Combining Time & Distance

When the decimal distance and time systems are combined, the result is extremely easy to use. The smallest scales are easy to remember, and you don't need to know the exact distances for the larger ones. Every map designed for use with the CC game will always use one of these scales. Hex sheets printed on clear plastic are available in many hobby shops, and if you find the right size of hexes, such sheets could be used simply as overlays on a published normal map.

Now look at the opposite page and read the Preamble.

Preamble

The first cyborgs were actually created long before the alien attack.

Richard Sawtell was studying computer science and neurosurgery at UCLA when he quietly developed the Sub-cranial Interface & Neural Converter (SINC) in 2016. His invention converted nerve impulses into electrical signals (which was not new) and computer-generated commands into controllable nerve impulses (which was).

Sawtell was somehow convinced to abandon his plans for higher studies. He accepted a commission in the United States Army, and was soon working at a top-secret installation in southern Virginia. After relocating, he received an anonymous donation of approximately ten million dollars (after taxes). His invention was made semi-public knowledge in 2017, and the wording of the press releases implied that the Army research program had made it all possible.

Within two years, Sawtell produced a development that made paraplegia a phenomenon of the past. Nerves could be replaced by wires, and muscles by simple mechanisms. All were operated by the individual's normal nerve impulses, as if no change had occurred.

The Army began testing a top-secret offshoot of this development — combat armor usable by a normal soldier. The armor was utterly bulletproof (except for a face plate), and the devices that moved the arms, hands, and legs were controlled directly by the operator's nerves. Unfortunately, it was impractical to remove the user from the armor, once inserted, because of the elaborate medical operation required. The project was shelved.

Inter-service rivalries still being quite common, the U.S. Air Force began its own research on the topic. In 2019, Dr. Nkruma Kotusu, a citizen of Nigeria, was brought in to work with this parallel research program, using a spare NASA lab in Florida. At the age of 42, Dr. Kotusu was a renowned scientist and practiced neurosurgeon, and he was considered more reliable (and certainly less expensive) than the flamboyant and unpredictable Sawtell. However, Kotusu and Sawtell deduced each other's existence and made secret contact via their computers. This was no surprise, considering their brilliance in computer science. Though initially cautious, they had identical interests that eventually led to a friendship of sorts.

When the government discovered their

collaborations, Kotusu was transferred to Sawtell's Virginia lab, "on loan" from NASA. But the two scientists discovered that they could not work in close proximity. Among other things, Sawtell was a compulsive smoker and rather messy, while Kotusu abhorred physical vices and was exceptionally tidy. They continued joint operations while remaining physically apart, using separate workshops. And the breakthroughs continued.

The accidental death of Sawtell's wife in 2020 spurred him on a personal quest for immortality. He decided that most of the human body was an unfortunate and heretofore unavoidable load of baggage. Combining this rather bizarre concept with further advances in research, he and Kotusu succeeded in isolating a pig's brain during the winter of 2022. The disembodied brain, maintained by fourteen cubic feet of life support hardware, was wired to the controls of a small piglike robot. Within a week, the "pigbot" (dubbed

"Melba," in honor of Sawtell's late wife) was happily trotting around the lab, and had already learned to perform several tricks.

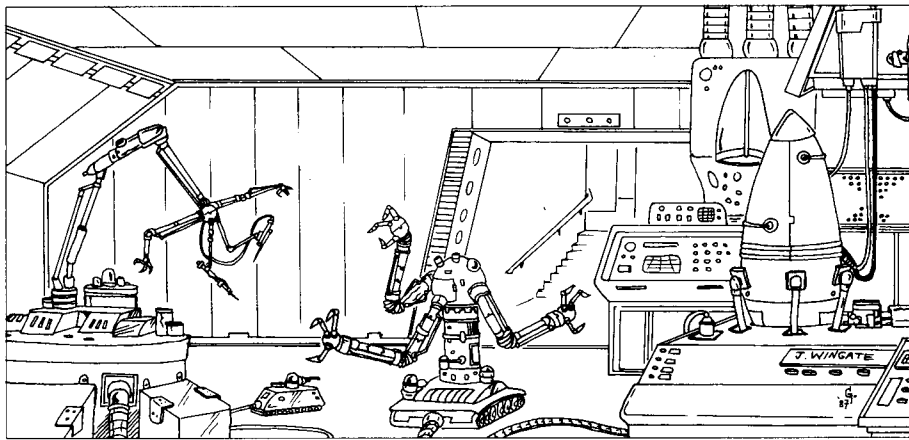
The first experiments on human volunteers ended tragically. Sawtell shrugged off the deaths as necessary and obsessively continued his work. Kotusu agonized, but recovered. Sawtell was delayed for a month by a double lung replacement operation (the technology for which was an offshoot of his earlier discoveries), but nevertheless refused to quit smoking. Kotusu continued his neat, methodical, but slow progress.

Finally, in 2024, the first successful human brain relocation procedure (BRP) took place. In the Richmond suburb of Bellwood, Virginia, PFC Jackson Douglas Wingate, a black soldier and former car mechanic from Tallahassee, Florida, was tightening a cable on a shipment of metal pipe when the entire load suddenly broke loose, cascading from the tractor trailer and crushing him. Severely injured, he was placed on total life support and subsequently transferred to Richmond General Hospital. To keep him alive, 95% of his body would have to be replaced by synthetics. However, when given the choice, PFC Wingate elected to be the subject of a new type of operation.

The brain and certain glands of Jack Wingate were placed within an egg-shaped steel container between 2:00 and 9:00 P.M. Eastern time on July 4th, 2024. The procedure took place in Richmond General Hospital's operating room #2, which was purchased and dismantled by the Smithsonian Institution on July 5th.

After stabilization, Wingate's brain was connected to a slightly larger, modified version of the Melba-type pigbot. The first few days were a time of severe psychological trauma, but Wingate's excellent mental health and optimism led to a complete recovery. When Dr. Kotusu created a humanoid mechanical (dubbed "humanical") body a few months later, control of it was given to this brave soldier. In the Spring of 2025, Wingate performed for the President of the United States, the Joint Chiefs of Staff, several dozen medical conferences, and six public exhibitions. The public saw Jack Wingate as potentially immortal, and although the government did not predict general availability of the technique for at least two decades, an official waiting list was started and maintained by the Surgeon General. Despite





the projected cost of 2.5 million dollars per person, applicants were abundant.

In the months after the success with Wingate, four other BRPs failed, but these were never publicized. Also unrevealed was the fact that the Army had begun performing secret BRPs of its own. The military established a "brain bank," coded Project Eggshell, for its own experiments and future uses.

Religious institutions worldwide condemned the humanical as unnatural, unnecessary, presumptuous, and immoral, and described its creators in much the same terms. This bothered Dr. Kotusu greatly, but Sawtell not at all. The revelation that humanicals were sexless did not ease the situation appreciably.

Kotusu refined the humanical form, appeared on magazine covers, and enjoyed this long-sought publicity. At his urging, the U.S. government grudgingly agreed to sell the new humanical technology (keeping various key elements top secret, of course). New labs were soon established in China, Russia, Japan, Germany, and other countries.

Sawtell shunned exposure, in part because his personal life and habits were not of a flavor enjoyed by the public. During this period, he delved further into the problems of connecting the brain with a computer. His work veered in another odd direction when he began experiments in ESP, a field recognized by the scientific authorities but considered sporadic and unreliable — epithets which were still applied to Sawtell himself, despite his accomplishments. Dissatisfied with the label applied to the phenomena — "extra-sensory" implying abnormality, and "perception" being augmented by dynamic actions of purely mental origin — Sawtell renamed the field "Psychogenics."

By Freedom Day of 2027 (a January holiday once named for Martin Luther King, Jr.) a dozen subjects had been proven reliably telepathic. One of them had even levitated a plastic button 23 centimeters. This event was fully documented with video cameras.

None of these psychogenically talented people were willing to undergo the BRP, however, until Sawtell convinced Melissa Dutrick, a young female subject with whom he had reportedly been carousing, to give it a try. (She later claimed that she had been told the operation was reversible, despite having signed a legal agreement that specified the contrary.) "Missy" Dutrick's surgery on May 12, 2027 went smoothly, and Jack Wingate helped her over the psychological hurdles.

Missy was the first truly successful cyborg (cybernetic organism). Her humanical body was made larger than Wingate's, and her steel brain case smaller, so that the two could be combined into one mobile unit. And after testing, some of her circuitry was found to be supernumerary, for, as Sawtell had predicted, her psychogenic powers could bypass some of the neural connections required for the SINC device. Kotusu had scoffed at this possibility, and was now depressed as he re-evaluated his theories. Sawtell was elated, and proposed to Melissa, fulfilling, some say, a promise that had made her agree to the operation. It is noteworthy that when Missy declined, Sawtell was not noticeably saddened.

Missella Dutrick's undeniable but unprecedented method of operating her humanical body shook the scientific community. Her extra-sensory powers made years of additional development unnecessary, at least for those similarly gifted. The Army later allowed her to purchase her new body, with the condition that she remain employed by (though not confined to) the research lab.

A change in political administration brought corresponding shifts in the upper echelons of the military. One new arrival to the Army Command took over Project Eggshell and altered its program in light of the new discoveries. Basically, this general wanted official military fortunetellers. Within a few months, Eggshell had completed successful BRPs on dozens of new volunteers, all gifted with some measure of psychogenic ability. Sawtell discovered

the secret but kept it. He notified the project commander of his readiness to cooperate, without Dr. Kotusu, in establishing the first Cyborg Corps.

Dr. Kotusu presented the world's religious authorities with thoughtful treatises on the sanctity of medicine and the importance of cybernetic research, dwelling on the absence of mortal flaws and weaknesses in the metallic form. The authorities responded kindly, and focused their attacks on Sawtell, somehow discovering and publicizing some of his less-than-exemplary past. Melissa Dutrick was condemned as the Harlot of Babylon, with Sawtell cast as the Antichrist, and both were ordered to repent their ways. Melissa said she'd think about it for a few centuries, which only served to aggravate them further. Sawtell ignored them as usual, being preoccupied with certain fascinating offshoots of psychogenics — including astral projection and spirit photography.

Suffering under the pressures of his conscience (stimulated by the authorities of his religion, though he did not realize this), Dr. Kotusu began work on an alternative to the "disembodied brain" method of cyborg control. In secret conferences with high officers of the Air Force, he proposed returning to Sawtell's original concept, now abandoned — cyborg bodies as super-armor for ordinary soldiers.



This was quickly approved, more for pragmatic reasons than for humanitarian ones. In October of 2029, Kotusu and Sawtell said their goodbyes and left the Humanical Project in the hands of other competent but less creative scientists. Both indicated ambiguity about future plans and remained secretive about their new projects. The generals still quietly pulled all the strings.

Jack Wingate declined the offer of a transplant into a more up-to-date humanical form, seeing it as a regression. In the course of experiments, more and more hardware had been attached to his brain case; his pieces now occupied three large rooms, and he dreamed of becoming the world's largest and most important humanical. Among other things, he was then serving as the lab's inventory controller, purchasing agent, master personnel file, and traffic controller. Meanwhile, Wingate was developing his own secret plan to enter and dominate the CIA computer.

Melissa Dutrick stayed in Virginia, where she urged the new scientists to make her form more visually appealing. She thereby inspired a line of research that produced the first "bulletproof" synthetic skin. She also wheedled Jack Wingate into secretly modifying her SINC to provide her with a unique broad-spectrum sensory input that she found to her liking. Luckily she had the wisdom to use it sparingly.

Richard Sawtell moved to Utah and began work on the Army's secret Cyborg Corps, and a dozen other scientists began similar secret projects in other countries. Most of their commanders knew of the efforts of their competitors, but hoped to gain the lead in this new type of arms race. Sawtell did not bother with such details. He inspired his new team with his creative genius, developing startling new weapons that could be built into the humanical form. He also began studying out-of-body experiences.

Dr. Nkruma Kotusu returned to Florida and, by modifying a standard NASA space suit, developed the first version of cybernetic armor. He joined a local fundamentalist church and became a lay pastor; his favorite lecture topic was the weakness of the flesh.

On January 11, 2035, an accident at a Chinese "air testing station" near the south pole caused the detonation of 20 or more nuclear devices. The cause of the accident was thought to be a rogue meteor strike. The ensuing weather patterns kept international anger, directed at the Chinese, to a minimum. Nuclear war was feared but did not occur, in part because horrific snow and rain storms beset all the continents, and a rise in tides (due to the melting of trillions of tons of ice) caused widespread damage to the world's sea-coasts. Surface naval operations were

impossible, and air travel was nearly so.

It is now presumed that the explosion and its effects were carefully planned. Two days later, while the storms and tides were reaching their height, the air was suddenly filled with additional horrors — the alien invaders.

Another Viewpoint

In the early part of the 13th century, an innovative military commander named Gengis Khan made a serious attempt to unify Asia. On a large island in western Europe, a group of minor political leaders forced their king to concede certain privileges, itemized on a document called the great charter (Magna Carta). Africa and the Americas were controlled by nations of sophisticated people who had happened to develop culturally and technologically in different ways than the Europeans and Asians had; they were thus called savages. And a mechanical device landed safely on the moon for the first time in several dozen centuries.

This device, an automated probe, had been launched by a technologically advanced but, at least by human standards, morally deficient civilization. The launch point was about 700 light years from Earth, in the direction of the galaxy center. Upon leaving normal space, the probe sped along its programmed course, heading toward a relatively unexplored galactic arm. It deliberately rammed one of a pair of gravity peaks about twenty minutes later, which resulted in its immediate appearance in the close vicinity of the planet known to modern Man as Jupiter.

Sensing no immediate hostility or danger, the probe conducted a standard system survey, and subsequently detached two of its mobile units to investigate the large outer planets. Meanwhile, it proceeded inward, toward the potentially more lucrative and certainly warmer bodies, but only after vaporizing its Quantum Drive for security reasons. After detailed examinations a few months later, in the course of which additional mobiles had been dispatched to Mars and Venus, the probe descended to the surface of Earth's moon. Its passage was not noted by Man.

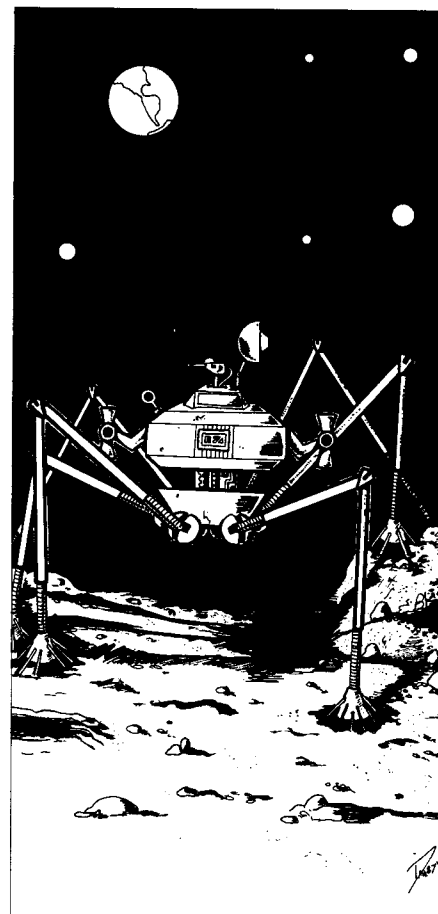
The probe analyzed the data as it approached, and found that concealment would not be a major factor. Although Earth was populated, no unnatural emanations were detectable, indicating a low level of technological development. And since the moon's period of rotation exactly matched its orbit, the probe's landing site, if carefully chosen, would not suffer regular scrutiny by Earth's future residents. The probe decided on a location high along one wall of a minor crater (known to modern human astronomers as Plutarch, at 84°E, 25°N). This was a site from which it could observe and monitor the Earth's

surface, but one not likely (in the probe's considered opinion) to attract attention.

Over the next few centuries, the probe monitored and analyzed the development of terran civilizations, and broadcast condensed versions back to its creators at irregular intervals, again for security reasons. Since these messages were limited to the speed of light, the creators' first verification of the probe's successful efforts occurred in 1922.

The probe was not the only one of its kind, but rather one of thousands. Its creators had developed an interstellar empire by sending probes in many directions (and to vast distances, using the Quantum Drive), and modified their plans of galactic conquest on the basis of the latest information received thereby. The news from this particular probe happened to arrive on the same day as several other messages, and several weeks passed before the information was fully discussed. The situation seemed promising, so a second probe was sent to obtain up-to-date information. It returned within a week, carrying the remarkable story of man's progress between the 13th and 20th centuries, along with a complete filmed version of World War I.

The alien leaders debated the use of Earth for several years, that being only one of many concerns. They did not fear





Man; so many centuries had passed since their last military defeat that such a concept did not even arise. Instead, they debated the proper course for exploiting Earth as a new outpost, and its future benefits. That region of the galaxy had been less fruitful than others in the past, and might have gone completely ignored had not a few key individuals been absent during a crucial period of discussion a thousand years earlier. But, probes were sent, and Earth was now being considered for addition to the Empire — though certainly not in a friendly manner.

After the proponents of expansion established Earth's place in the overall plan, those responsible for the execution of policy spent a few decades planning the appropriate method of reaching the goals. Another probe was sent to gather the latest data, and it returned in the year known to humans as 1956 with news of predictable aeronautical developments, and another film of a major conflict, World War II. The plans were modified to include projections of future technological developments, and the attack vessel was assembled. The speed of Man's technological development exceeded that of any previous contact, but since the project had been transferred to another department of the alien bureaucracy, this datum did not reach the attention of the policy makers. Had it done so, they would probably have stopped the project and simply destroyed the planet.

The attack force consisted of one vessel about the size of a ten-story office building. It was equipped with a matter processor, six self-replicating computers, an energy collector, and two living beings. In November 1985, it arrived in Jupiter orbit, as the earlier probes had. The vessel eventually homed in on the lunar observer, landed, and dug in to begin operations. Its existence was carefully shielded, but signs of its arrival were seen by a technician on the evening shift at Mt. Palomar observatory, who was certain only that he saw a few stars disappear and then reappear, as if something were passing before them. His log note was dismissed later as being an optical illusion, but it can be found today in the records for that month.

The alien commander's first action was the projection of a huge magnetic field, hundreds of miles across, which gathered solar radiation for power. Devices began busily mining and processing lunar ore, and once sufficient materials had been gathered, the computers began replicating themselves. The aliens did not worry about their task; they had done similar things several times before, usually facing much more highly developed civilizations. They did not realize that never before had the Empire faced a race so creative, quick to develop, and tenacious as Man.

Earth remained relatively placid to the aliens' watchful eyes. They scoffed at the primitive spacecraft that occasionally ventured forth, and were not surprised when a manned one exploded in early 1986. They sneered at the amount of untidy debris left in orbit, but made careful note of the occasional satellites that scanned as radioactive (presumably nuclear devices), plotting their positions for later disposal. The manned orbital station begun in 1994 was worth watching, but only for the speed with which man learned about the vacuum environment and evolved to function in it.

As planned, the invasion force was completed in 2033. After decades of tireless work, the aliens' modest tools had produced thousands of soldiers. Their forms had been selected, with careful consideration of Man's psychology, to resemble something feared by the entire race. Some of the policy makers had favored the reptilian form, but that idea was discarded — primarily because the myths of man indicated repeatedly that humans always defeated the dragons, and dinosaurs were laughable. A demonic form was almost used, but finally voted down because of its utterly imaginary origins, and also due to the popularity of a role-playing game in which such beings were routinely encountered and destroyed. No, a perversion of reality was considered best; a deadly extrapolation of a normal creature, known to peoples of all social, economic, and political climates. The attacking troops were made to resemble insects — but larger, more horrible, and far more dangerous.

Phase I (resource preparation) in the plan to conquer Earth was over. Phase II began immediately. Though Man fought battles with insects on a daily basis, his subconscious fear of them had to be brought to his conscious attention.

A periodic meteor shower, the Perseids, occurred in August each year. In 2034, these lumps of space debris were accompanied by several hundred capsules, which entered the atmosphere and burned in an identical manner. But these capsules, launched from a point on the moon near the crater Plutarch, contained synthetic hormones. The cargo sprayed out over the jungles of several continents, and in the autumn of that year, scientists speculated on the cause of the massive insect plagues that arose. Of course, none of them even guessed at the correct answer. As the pestilence spread, the aliens' primary attack force was brought to full readiness, for its time was nearly at hand. The aliens watched carefully, and waited.

In January 2035, the first human reports of odd hormones reached the news services, and speculation began. Were these the weapons of a new terrorist or a crime syndicate? Or were they the experi-

ments of a mad genius? The aliens knew that the time had come. One last "meteor" sped toward the Earth's south pole, exploding on impact and triggering the detonation of a few dozen other nuclear devices of Chinese origin that had been hidden there.

Two days later, using the cover provided by the tumultuous weather caused by the explosion, the invasion force was launched. Descending in their vessels (actually huge armored creatures produced by genetic engineering), several hundred thousand alien warriors (subsequently dubbed Xenoborgs) landed on the Earth's surface at 4:52 A.M. Houston time on January 13, 2035. Only a few failed to reach their designated landing points. On every major continent, and within every political boundary, the aliens arrived. Military bases, missile silos, airport runways, and shipyards were thoroughly treated. Over half the invasion force descended on Asia, which, with its population of 6.8 billion, was a special concern.

Careful planning paid off. (Indeed, the aliens would have been quite surprised had it not.) The Xenoborg troops, armored to resist the known weapons of Man and armed to penetrate his defenses, easily defeated the conventional forces that met them. A few nuclear devices were used, but only by humans, and to little effect; the attackers had spread too fast, and too widely, to be seriously hampered by them. Once men realized that "one nuke, one Xenoborg" was a fair exchange, they also realized that such applications would be tantamount to destroying the planet. The Xenoborgs kept to the open spaces, avoiding the cities, which the alien commander wanted intact, and generally let Man's forces come to them.

Within days, most of the Earth's surface was held by alien troops. Many of the national governments had collapsed or fled, and though less than a third of humanity had been destroyed, the rest were in hiding. Most modern conveniences vanished; food and water distribution, power and light, electrical communication — nearly all were gone. Most military bases had been completely destroyed. People hid in cellars, in caves, anywhere that the Xenoborgs had not yet penetrated. Many waited for the end, praying for deliverance. But some organized and searched for a way to fight this threat, possibly the last that Man would ever face.

The remnants of Earth's military forces examined their opponents, and found only one viable counterthreat — the humanimals of Richard Sawtell and Dr. Nkruma Kotusu. Conventional forces had little or no effect on the Xenoborgs, that much was known; so the few remaining resources of the world were used to complete the only possible defense: the CYBORG COMMANDO Force.

How to Use the Dice

If you are familiar with other role-playing games, some of the following will be old familiar stuff, and you can skip the first parts. But carefully read the section entitled "Multiplying Results," as it describes the system most often used in this game, which is a method of using the dice that you have probably never tried.

In the CYBORG COMMANDO™ role-playing game, just as in other games, you will roll one or both of the dice whenever you must randomly select one result from several possible. (You do not roll the dice to move.)

Each of the two dice provided in this game has ten sides. Throughout the game, the mention of a ten-sided die is abbreviated as "d10," and the die itself is thus called a "dee ten." The zero on the die is always read as 10, except for two special cases: if a number from 1 to 100 is desired (see Simple Rolls, below), or if an instruction in the rules specifies clearly that 0 means zero (which is rare).

Simple Rolls

If you roll one d10 and then read the number that is on its uppermost surface, you will find a result from 1 to 10. No result turns up more often than any other; each has an equal chance (10%) of occurring. This type of roll is usually called simply a "d10 roll."

The two dice supplied with this set should be different colors. If you roll both together, you can get a number from 1 to

100 by reading one die as "tens" and the other as "ones." In this case, a zero is read as a zero, not as a ten. If you roll two zeroes, that means 100. Before you roll the dice, however, you must declare which die is going to represent tens; this is usually done by calling out a color before you roll (i.e., "red high"). Similar to a straight d10 roll, each possible result has an equal chance of occurring (1% this time). This roll is called "dee hundred" (d100), or "dee percentage" (d%) since the result is often read as such.

Adding Results

If you roll two dice and add the results, the total will be a number from 2 to 20. The possible totals occur with different frequencies. There is only one way to get a 2 (both ones) or 20 (both tens), but there are two or more ways to get any other result; for example, a result of 10 could be 1 + 9, or 2 + 8, or some other combination. This game never uses more than two dice, but any number could be combined in this manner. This type of roll is thus described by stating the number of dice used, and assuming that the results are added. The roll is called "two dee ten" (2d10).

Multiplying Results

If you roll two dice and multiply the results, the total will be a number from 1 to 100, similar to the d100 method described

above. But unlike that system, this one does *not* produce every number from 1 to 100, and the possible totals occur with different frequencies. Since for this type of roll you multiply d10 x d10, the roll is described and abbreviated by dropping the last repetitive d10 designation, leaving "dee ten eks" (d10x).

This system is used throughout the CYBORG COMMANDO game for several reasons. Most people can multiply two single-digit numbers easily, and often with less trouble than adding two-digit numbers. The system produces results that still span the convenient 1-100 range (which can still represent a percentage), but with unusual frequencies of results.

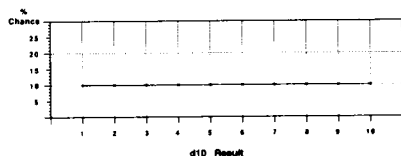
In the combat system, a single d10x roll determines the chance to hit and, in many cases, damage as well. That single roll easily determines clear misses, hits producing superficial damage, hits for actual (body) damage, and "critical hit" effects, all at the same time.

In the skill system, minimal gains in low scores produce great leaps in the percentage chances of success, but improvements in high scores produce only small increases. This reflects true life to some extent; a little knowledge of a topic opens new horizons and makes many things possible for the first time, but a high level of expertise takes much time and effort.

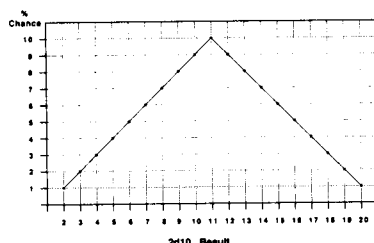
Since this type of roll is unfamiliar to most people, statistical data on the results are given on the next page. You do not need to know those details to play the game, but they are provided for those who are interested.

Graphs

Probabilities are often clearer when shown with diagrams than when explained with words. Graphs 1 and 2 (left) show the chances for getting a single result when using 1d10 or 2d10, respectively. Graphs 3, 4, and 5 (next page) show the cumulative chances for results of d10, 2d10, and d10x rolls. Each of these last three graphs displays two lines. One shows the chance of getting a result equal to or *less* than a given number; the other is the opposite, showing the chance of getting a result equal to or *greater* than a given number. For additional details on the probabilities of results, see the d10x system description on the next page.



Probability Graph 1: 1d10



Probability Graph 2: 2d10

The d10x System

If you are an experienced gamer, you are familiar with various methods of using dice. However, the d10x system produces a probability curve that may be unlike any other in your experience.

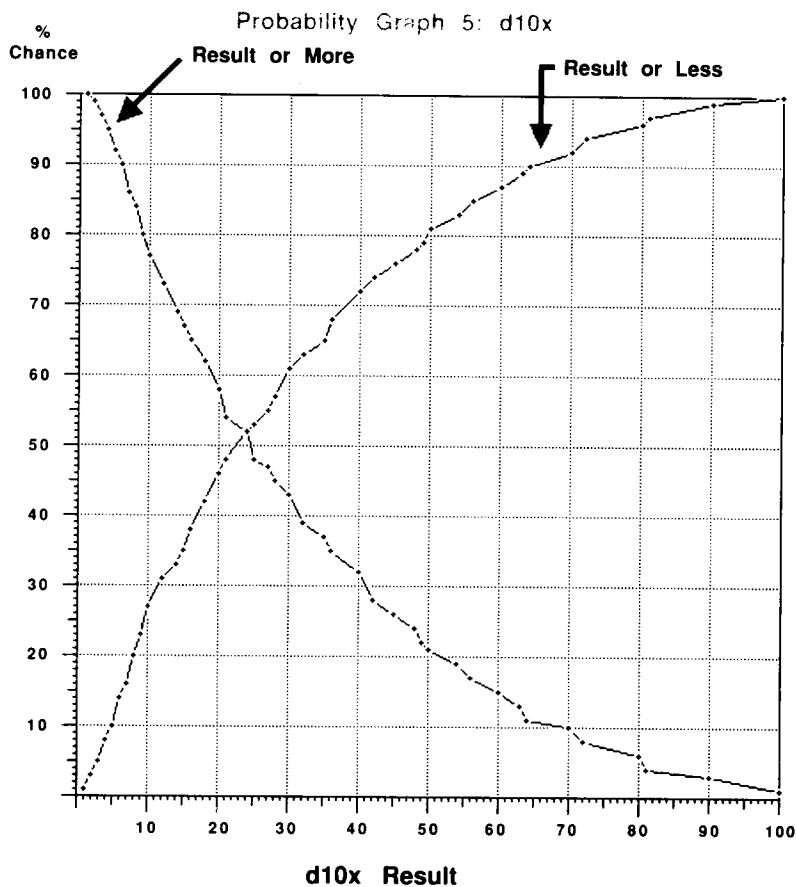
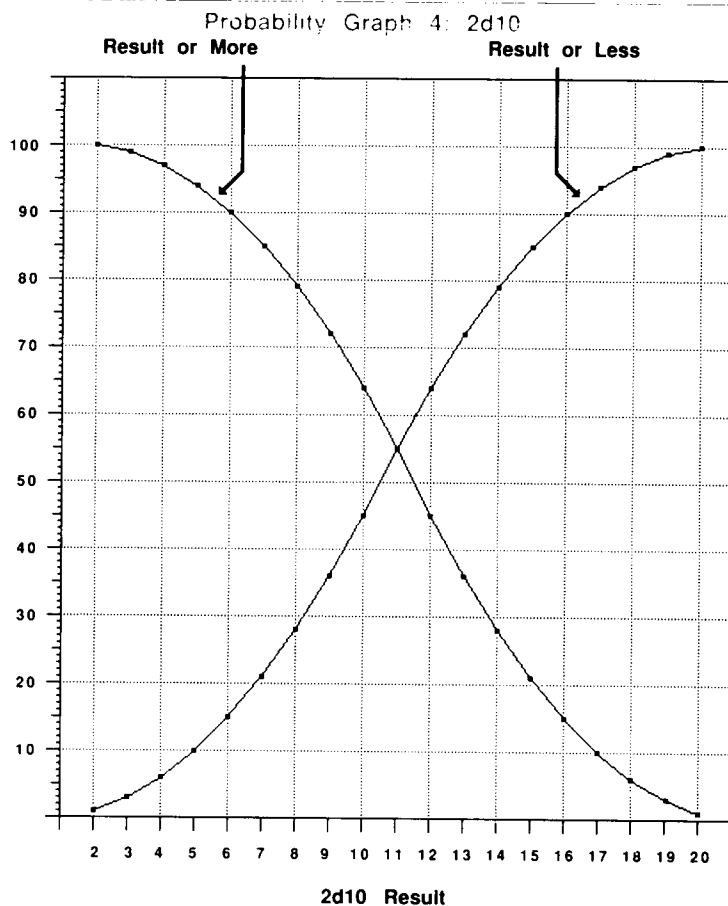
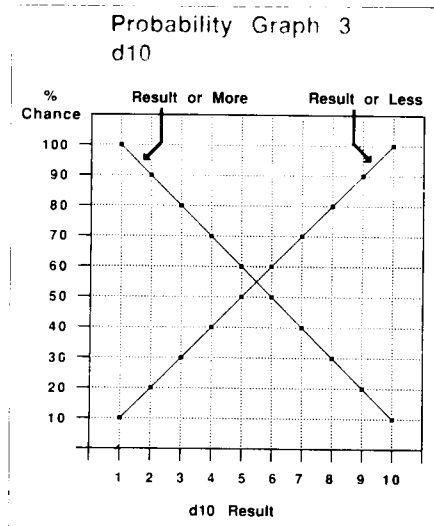
Table 1 gives the percentage chances for obtaining various results when using the d10x system. Column 1 lists all the possible results of the roll, and column 2 gives the exact percentage chance for getting each result. Columns 3 and 4 apply to the combat system. Column 3 (Result or More) gives the percentage chance of penetrating a target's Defense Value (DV). The net chance of a clean miss is given in column 4 (Result or Less). Columns 4 and 5 apply to the game's skill system, wherein a d10x roll determines success at an attempt to use a skill. Column 4 gives the actual chance of success for each skill score. Column 5 gives the increase in the percentage obtained when a skill score is increased from the score listed just above it.

The average result of a normal d10x roll is 30 1/4. The median result is 24; that is, you are equally likely to roll either 24 or more or 24 or less. Exactly one fourth of all the possible results are odd numbers; three fourths are even numbers.

Example: Suppose that your character has earned 4 Skill Points in an adventure (which may be spent to improve skills). If the character has a rating of 21 in skill area A, and 35 in skill area B, how would you spend the SP on the two skills?

By the odds given on the table, the character has a 48% chance of success with skill A, and 65% with skill B. If you put all the SP into skill A, the chance increases from 48% to 53%, for a total gain of 5%.

But only 1 SP expended on skill B would raise it immediately by 3%. If you spend 1 SP on skill B, and the other 3 SP



Dice

on skill A, the chances for success with skill A (SR 24) are 4% better, and for skill B (SR 36), 3% better — a total gain of 7%.

Combat Ratings

An attack is a “clean miss” if the result of the d10x roll is a given number or less. That number is called the Combat Rating (CR) of the attacker. A starting character has a CR of 10. Improvement comes with experience, and the CR is reduced accordingly. For a starting character, the average result of an attack roll that is *not* a clean miss is 39.1.

Combat Ratings range from 1 to 99. A typical trained human soldier has a CR of 15; a typical untrained adult civilian's CR is 40. A CR penalty (i.e. an increase in the number) may be applied because of fatigue, injury, use of an unfamiliar weapon, and so forth. Use column 4 (Number or Less) to find the net chance of a clean miss for any Combat Rating.

Table 2 (below) gives details on the Combat Ratings most often used in the game, along with the chances of a clean miss for each.

Skill Rating Gains

Skill Ratings range from 0 to 100, representing the span of no knowledge (0) to complete knowledge (100) of any given subject. A Skill Rating (SR) may increase with education and experience. The most lucrative gains (3 % to 4 % per point of SR gained) generally occur when ratings are low. The least productive gains (less than 1%) generally occur when ratings are high, with the worst at the very end. These gains are summarized in Table 3 (right).

d10x Table 2
Combat Ratings

Combat Rating	Misses on...	Chance of clean miss
CR 50	1-50	81 %
CR 40	1-40	72 %
CR 30	1-30	61 %
CR 25	1-25	53 %
CR 20	1-20	46 %
CR 15	1-15	35 %
CR 10	1-10	27 %
CR 9	1- 9	23 %
CR 8	1- 8	20 %
CR 7	1- 7	16 %
CR 6	1- 6	14 %
CR 5	1- 5	10 %
CR 4	1- 4	8 %
CR 3	1- 3	5 %
CR 2	1- 2	3 %
CR 1	1 only	1 %

d10x Table 1: Percentage Chances

Die Roll	Result Alone	Result or More	Result or Less	Skills: % gain per SR point	Die Roll
1	1	100	1	1	1
2	2	99	3	2	2
3	2	97	5	2	3
4	3	95	8	3	4
5	2	92	10	2	5
6	4	90	14	4	6
7	2	86	16	2	7
8	4	84	20	4	8
9	3	80	23	3	9
10	4	77	27	4	10
12	4	73	31	2	12
14	2	69	33	1	14
15	2	67	35	2	15
16	3	65	38	3	16
18	4	62	42	2	18
20	4	58	46	2	20
21	2	54	48	2	21
24	4	52	52	1 1/3	24
25	1	48	53	1	25
27	2	47	55	1	27
28	2	45	57	2	28
30	4	43	61	2	30
32	2	39	63	1	32
35	2	37	65	2/3	35
36	3	35	68	3	36
40	4	32	72	1	40
42	2	28	74	1	42
45	2	26	76	2/3	45
48	2	24	78	2/3	48
49	1	22	79	1	49
50	2	21	81	2	50
54	2	19	83	1/2	54
56	2	17	85	1	56
60	2	15	87	1/2	60
63	2	13	89	2/3	63
64	1	11	90	1	64
70	2	10	92	1/3	70
72	2	8	94	1	72
80	2	6	96	1/4	80
81	1	4	97	1	81
90	2	3	99	2/9	90
100	1	1	100	1/10	100

d10x Table 3: Best & Worst Skill Rating Increases

Best Gains			Worst Gains		
From	To	Gain per SR point	From	To	Gain per SR point
3	4	3 %	32	35	2/3 %
5	6	4 %	42	45	2/3 %
7	8	4 %	45	48	2/3 %
8	9	3 %	50	54	1/2 %
9	10	4 %	56	60	1/2 %
15	16	3 %	60	63	2/3 %
35	36	3 %	64	70	1/3 %
			72	80	1/4 %
			81	90	2/9 %
			90	100	1/10 %

Character Creation: Basic

The following method of character creation is called the "Basic Game" method. After you have used this system for a few games, try the Advanced version (page 14). You can easily covert Basic game characters to Advanced form. Whenever you see separate details for Basic and Advanced rules about any topic, use the Basic details for now.

Before you begin with Step 1, you need a pencil and a character sheet. For the latter, you have permission to photocopy the back cover of this booklet for personal use. You can also just use it as a guideline. The character sheet provided is usable in both the Basic and Advanced games, so just ignore the sections of the character sheet that are not mentioned in the following procedure.

As a final preparation, ask your Game Master — or decide for yourself, if you don't have a GM yet, or if you are one — whether you will use the Metric or English system to measure things throughout the game. We strongly urge the Metric system, for a variety of reasons, which are summarized in the Campaign Book on page 3. The only effect it will have on character creation, however, is in Step 7, when you calculate (among other things) the amount of weight, in either kilograms or pounds, that your character can throw, lift, and carry.

Step 1: Start

First you must describe your character — the human, that is, not the combined human-machine (cyborg) he or she will become. You will use numbers to measure and define the qualities that make up that imaginary person.

The most important aspects of a character can be grouped into two areas:

Stats (short for statistics), which describe the most basic aspects — a character's mind, body, and the connection between them (nerves)

Skills, those abilities or talents involving knowledge and experience

Other details will be left to your choice. These include your character's physical appearance (height, weight, etc.), historical background (home, education, etc.), and basic psychological traits (outlook on life, likes & dislikes, and so forth).

The unit of measurement for Stats and Skills is simply called a Point, abbreviated as SP; the S stands for both Stats and Skills. You start with 60 SP. You will divide these points between Stats and Skills, always using whole numbers, never fractions or decimals.

Of the 60 SP, you *must* use at least 20 for Stats, but you may use as many as 50. Thus, your total Skill points will be at least 10, and 40 at most.

Before you can intelligently assign SP for either Stats or Skills, however, you must know how they will affect play. When your character tries to do something that could succeed or fail in the game, a die roll determines the result. If that action involves some basic element of the character as opposed to an acquired skill, the appropriate Stat governs the chance of success. The same type of roll is made when a skill is involved. These rolls are called Stat checks and Skill checks, respectively. (See page 16 for details.)

Step 2: Select Stats

Remember that you start with 60 points, and you must use 20 to 50 of them for Stats. The Stat points will be divided between three separate Stat scores: Mental, Neural, and Physical. For a typical adult human, "average" stats are as follows. Younger persons usually have better Neural scores than adults, but worse Physical scores.

	Male	Female
Mental	10	10
Neural	10	15
Physical	15	10

Each Stat score represents and regulates several different aspects of the character, as follows.

The MENTAL Stat represents:

intelligence in the abstract, and the amount of information that can be retained,
the number of skills your character can learn,
the speed at which information can be acquired (learned) and used (recalled), and the accuracy of such information,
cleverness, willpower, and general

mental stability, and
the speed at which the mind can recover from psychological damage.

The NEURAL Stat represents:

physical agility and speed of action, all forms of movement and the ability to control them, such as accuracy in attacking,
stamina (endurance), the ability to maintain control over one's body, and
the speed at which physical control can be recovered after it is lost (when the character has been stunned, knocked out, or drugged).

The PHYSICAL Stat represents:

brute strength,
the weight that one can lift, carry, or throw, and the amount of damage that can be inflicted without weapons (such as by punching),
the amount of physical damage the body can withstand before becoming useless or destroyed, and
the speed at which physical damage will heal itself or respond to medical treatment.

Select your Stats now. Divide the total points that you have decided to use between the three Stats. You must assign at least 5 points for each Stat, and all Stats must be whole numbers. Deduct the points used (20-50) from your starting points (60), and reserve the rest for choosing Skills when you get to Step #4). Write down your Stats on your Character Sheet, using the top line in each category (Capacity); ignore the other two lines (Integrity and Recovery) for now. The Physical score goes in the "Natural" column; another Physical score (given in Step 7) will apply to your CC body.

Step 3: Psychogenics

By the year 2035, the phenomena currently called ESP have been examined carefully and are now more clearly understood. The science has been renamed "psychogenics." All CCF volunteers have been selected for psychogenic ability.

However, psychogenics are optional in the game. All the players should talk with the Game Master, and decide as a group whether to use psychogenics. If you do

Character Creation: Basic

use them, psychogenic actions will be handled as skills.

Your character's psychogenic score (measured in Psychons of power) is equal to the Neural Stat score. If you are using psychogenics in the game, write the score in the space provided on your character sheet.

Step 4: Calculations

The Stats you have selected now determine various other measurable features of the character. These are all noted on the character sheet, just below the Stats. Fill in the information according to the formulas given here.

1. Find your Mental score, and use that number for the following calculations. Write the results in the corresponding spaces on the sheet.

Skills=1/3 Mental score, rounded to the nearest whole number.

Train=100 minus Mental score.

2. If the Neural score is less than 20, use "1" for this step. Otherwise, use the first digit of the Neural score. Write that number in all of the following places: Actions, Rest, & Speed.

Definitions

Skills: The maximum number of Fields of skill that your character can acquire. (Skills are determined in Step 4.)

Train: The hours needed for education in any skill, per point gained.

Actions: The maximum number of actions the character may perform in any one cycle of a Combat Turn. (Combat is explained in detail on page 25.)

Speed: The maximum distance the character can move, measured in map hexes per time unit. Each scale of map hexes corresponds to a different unit of time; the resulting movement rate remains the same number. Don't worry about it now, but be sure you read Game Time & Distance (page 2) before you play in a game.

Rest: The maximum number of days the character can function before sleep is absolutely required.

Step 5: Select Skills

Having a Skill means having knowledge about something. Thus, there are Skills covering everything, from aardvarks to zymurgy. But since even listing the individual topics comprising Man's knowledge would amount to hundreds of thou-

sands of entries, a more compact skill system that arranges them all into a few convenient groups is presented here.

Skills are arranged into two Divisions: Dynamic (or "action") skills and Static (or "reserve knowledge") skills. Within these Divisions are five general Categories: Movement, Combat, Arts & Language, Sciences, and Law. Two of these, Movement and Combat, are Dynamic Skills. These are often used in action settings, which are common in adventures. Static skills (the remaining three categories) are useful in other parts of the adventures, but are not often used during battle. Within the Categories are a total of twenty individual Fields of skill. Fields are further subdivided into Areas, but these are not used in the Basic game.

You may use points to "purchase" Fields, but not Categories or Divisions. The number of Fields you may purchase is equal to one-third of your character's Mental score (rounded down). You have already calculated this figure in Step 3.

Your character's score in a Field of skill is called the Skill Rating (SR). Thanks to intensive training before entering the CYBORG COMMANDO Force, your CC has a starting SR of 1 in every Field of knowledge, indicating a level of skill just above total ignorance. Do *not* write every Field on the character sheet. For any Field not specifically listed, the basic SR (1) is assumed. More details about the skills are given on pages 18-21.

Spend your remaining points (10 to 40) to "purchase" skills in any desired fields. Write down the number and name of each field purchased under the heading of "Skill Areas." Your SR in each Field chosen is equal to the number of SP you choose to spend on it plus one (the score you started with automatically). Write this score in the "Self" column next to the appropriate Field name. Ignore the "MM" and "Total" columns for now.

Skills: Other Details

You should now consider the other details that round out your character. This is not required, but that information does add a lot to the game. A role-playing game is more fun when you can play a complete and realistic role, not just a shallow and simple one. As you decide on these other details, make notes of them, for later reference.

Few of these other details are defined by numbers. All can be gathered into three basic groups: Physical, Historical, and Psychological. You may choose as many or as few of these details as you wish, and you can choose anything you like, within the scope of human experience. Discuss your choices with your GM to be sure they

do not conflict with the game plan.

Physical details include height, weight, sex, age, race, color & style of hair, eye color, handedness (right or left), etc.

Historical information includes name, birthplace, past residences, current home, economic & social background or class, friends & family, current & past professions, noteworthy experiences, places visited, etc.

Psychological traits include overall nature & personality, likes & dislikes, good & bad habits, and preferences as to colors, music, friends, and surroundings.

Step 6: The CC Body

When the human you have just finished describing becomes a CYBORG COMMANDO character, the brain is removed and placed within the mechanical body. The organic (human) body is kept safe in cryogenic storage, so you do not have to keep track of it for the game. Although the brain cannot yet be replaced in the body, the medical and technological requirements of such an operation should be discovered very soon — provided that your character and the other CCs can rebuild the CYBORG COMMANDO™ Force and cope with the aliens!

Skill Areas	
Dynamic Skills	
100. Movement	
110. Vehicles	
120. Personal movement	
200. Combat	
210. Strategy & tactics	
220. Unarmed combat	
230. Personal weapons	
240. Mass weapons	
Static Skills	
300. Arts & Language	
310. Personal arts	
320. Creative arts	
330. Cultural arts	
340. Language, basic	
350. Language use	
360. Communication dev.	
400. Sciences	
410. Computer	
420. Medicine and Health	
430. Terrestrial sciences	
440. Extraterrestrial sciences	
450. Other sciences	
500. Law	
510. Enforcement	
520. Borderline activities	
530. Criminal activities	

The Physical Stat of the CC body equals your natural Physical score plus 100. Write that total on the first line under "CC" in the Stats section of the sheet.

Next, calculate the Stat-based data that are derived from the Physical score, as shown in the insert below. Round off all results to the nearest whole number. Note: the method of calculation gives a bonus for using the Metric system.

Later, when your character returns to his or her natural body, you will need to redo the calculations using your natural Physical score, not the CC body's. But that will not happen in this set.

Combat Defenses

Your entire CC body operates on electrical power, which comes from storage batteries. This power is measured in Power Units (PU). You start with 200 PU, from which you will frequently subtract amounts used for operations, and add PU gained through recharging. Write your starting PU total on the back of the character sheet, and leave at least 1/4 of the page blank for keeping records of your current PU during play.

Whenever your character is attacked by an enemy, the attack will be one of five basic types — Laser, Impact, Thermal, Electromagnetic, or Sonic. In the combat system, an attack only causes damage if it penetrates the character's defenses.

These defenses are measured by

numbers, called Defense Values (DVs). Each DV is usually abbreviated by its first letter — L I T E S. The DVs that apply to your normal (unarmored) human character and to the CC body are listed in the table (top right). Write down the CC Defense Values on the back of the character sheet. You will not need the others until your character regains his or her natural body.

DVs can be improved by modifying the body or, in the case of Laser, Impact, and Thermal attacks, by using armor or equipment found.

Step 8: Meet MadMac

The MadMac computer provided with your character's new body brings various benefits, including some additional skills. Write the following skill Fields on your character sheet. Each has a Skill Rating of 10; write that in the MM column. If any of the MadMac's skill fields are the same as those you have chosen, don't write down the names again; simply put the SR (10) on the MM line for that skill.

210. Strategy & Tactics
220. Unarmed Combat
450. Communications
550. Energy Sciences
610. Law Enforcement

Now that all your character's skills are on the sheet, you can find the total Skill Ratings. Wherever you have written down

Defense Values

	Natural	CC
Laser	5	20
Impact	10	30
Thermal	5	35
Electromagnetic	10	25
Sonic	10	15

two numbers for one skill — one for yourself and one for MadMac — add the two numbers and subtract 1. The result is the total SR for that skill; record that in the Total column. For all other skills, simply copy the single score listed (either yours or MadMac's) into the Total column.

More details about MadMac are given in other sections of this booklet.

Now look over your new body (page 22)!

Summary

- Start with 60 SP. Divide them between Stats (statistics which describe the basic character) and Skills (knowledge and abilities of the character) according to the following limits on distribution:
Stats (total): min. 20; max. 50
Skills (total): min. 10; max. 40
- Divide the Stat Points between the three Stats: Mental, Neural, and Physical. Each Stat must have a score of 5 or more.
- Note the character's Psychons (if used).
- Perform calculations based on two Stats: Mental (Skills, Train) and Neural (Actions, Speed, Rest).
- Place the remaining SP in Skills (any Fields). Maximum number of Fields = 1/3 Mental Stat. All Skills have a starting score of 1 each. Write down all resulting Skill ratings "purchased" with SP.
- Make up other details as desired, including physical (height/weight, hair, eyes, etc.), historical (background, home, profession, general life style and events to date), and psychological (fears, likes, personality, etc.).
- Find the new Physical score for the CC body (100 + old Physical score), and calculate the details based on that Stat: Dmg, Heal, IP, and Heft (Throw, Carry, Lift).
- Add the new Skill areas provided by the MadMac, and write down the Total Skill Ratings in Fields that overlap.

You should not have anything written in the "IPs by location" box, the extra Stat lines, or the "EP" line.

Calculating Stat-based Data

Dmg = Physical + 10
Heal = Physical + 10
IP = Physical x 2

To calculate the data for the "Heft" section, find out from your Game Master whether you will be using the Metric or English system of measurement. Make the calculations below accordingly.

English System

Throw = Physical + 2
Carry = Physical x 5
Lift = Physical x 10

Metric System

Throw = Physical score
Carry = Physical x 10
Lift = Physical x 20

Definitions

Dmg: The fixed damage the character can inflict with a punch or kick.

Heal: The number of Integrity Points the character can recover, without treatment, per day. Note that this applies to organic parts only (i.e., those within the brains capsule). The CC body does not repair damage unaided. Once the character can reinhabit his or her natural body, the healing rate (based on the natural Physical score) will apply to that body as well.

IP (Integrity Points): The amount of physical damage the character's body can sustain. Use the space provided on the sheet (the IP side of the "Current Totals" box) to keep track of your CC's current IP total during play.

Heft: These subgroups represent the maximum amount of weight, in kilograms (Metric) or pounds (English), that your character can Throw, Carry, or Lift.

Character Creation: Advanced

Before you can create a character for the Advanced game, you must know how to create one for the Basic game. If you are unsure of the procedures, review them. (See pages 11-13.)

Step 1: Start with 180 SP

The Advanced game handles Stats and Skills in more detail than the Basic system does. You start with three times the Basic amount of SP. Of that 180 SP, you must use at least 60 for Stats, and you may use as many as 150. Thus, the total SP remaining for Skills will be at least 30, and 120 at most. You may still use only whole numbers, never fractions or decimals, for both Stats and Skills.

Step 2: Select Stats

A Basic character has three Stats: Mental, Neural, and Physical. In the Advanced game, each of the original Stats is divided into three parts: Capacity, Integrity, and Recovery. The nine Advanced Stats are as follows:

Mental Capacity: This represents Intelligence in the abstract, and the amount of information that can be retained. It also determines the number of skills your character can learn.

Mental Integrity: This determines the quality of information acquired (learned) and used (recalled), and the speed at which those activities can proceed. It also represents cleverness, willpower, and general mental stability.

Mental Recovery: This determines the time needed to recover from mental (psychic) damage.

Neural Capacity: This determines physical agility and speed of action. It affects movement and the ability to control it, such as accuracy in attacking.

Neural Integrity: This determines stamina (endurance), and the ability to maintain control over one's body.

Neural Recovery: determines the time needed to recover physical control after it is lost (for example, when a character is stunned, knocked out, or drugged).

Physical Capacity: This determines brute strength. The score affects the weight one can lift, carry, or throw, and the amount of damage that can be inflicted

without weapons (such as by punching).

Physical Integrity: This determines the amount of physical damage the body can withstand before becoming useless or destroyed.

Physical Recovery: This determines the speed at which physical damage will heal itself or respond to medical treatment.

Select your Stats now. Deduct the points used (60-150) from your starting total (180), and save the rest for Skills (step #5, right). Write down your Stats on your character sheet.

Step 3: Psychogenics

Assuming that you are using psychogenics in the game, copy your Neural Capacity score onto the line marked "Psychons." Ignore this line if you choose not to use psychogenics.

Step 4: Calculations

The nine specialized Stats govern the other measurable details of the character. Fill in the appropriate information accord-

ing to the formulas given on the chart below.

Step 5: Select Skills

Just as you did with the Basic method, you will "purchase" Skills with the remaining SP. However, you may now acquire individual Skill Areas, Fields of Skills, or even entire Skill Categories. Success at Skill checks is normally determined using the score in the specific Skill Area.

You are limited to a number of Areas equal to your Mental Capacity. You may purchase fewer Areas if you wish, but not more. Whenever you "purchase" a new Skill, remember to add the amount "spent" to the starting score (1) in that Skill, and to deduct the "cost" from the SP you have available.

The full skill list is given on page 19.

Areas

Purchase each Skill Area by the normal procedure. Write down the name and score of the Area on your character sheet.

Fields

When you acquire a Field of skills, the total cost is equal to the amount you wish

Stat-based Data

Skills = $\frac{1}{3}$ Mental Capacity, rounded to the nearest whole number.
 Train = 100 minus Mental Integrity.
 Actions = first digit of Neural Capacity score (or 1 if NC is 9 or less).
 Rest = first digit of Neural Recovery score (or 1 if NC is 9 or less).
 Speed = $\frac{1}{10}$ Neural Capacity.
 EP = Neural Integrity x 10.

Definitions

All terms are defined the same way as they were in the basic character notes (page 12), with the following exceptions.

Skills: The maximum number of skill Areas your character can acquire.

EP (Endurance Points): Units which measure the character's stamina, or "staying power." EP are used up at a fixed rate for various activities. Write the character's normal EP in the space provided, and use the boxed section to keep track of the current EP total during play.

Rest: The rate, measured in EP per Travel Turn (2.4 hours), at which EP are recovered by sleeping.

Speed: Note that instead of using just the first digit of the Neural score and discarding the remainder, you now use the entire score, for extra movement allowance. (Example: A score of 17 now allows speed of 1.7, not merely 1.)

to spend on all the Areas, minus a 20% discount. (Round the discount down before applying it.)

Example: Your character has starting skill only in Personal Weapons (#230), and you want to put 9 SP into each of the four Areas in the Field. The individual cost would be 9×4 , or 36 SP. The 20% discount is 7.2 SP, rounded down to 7. The net cost is 29 SP; after spending that, your CC has a score of 10 in each of the four Areas of Personal Weapons.

Categories

When you acquire an entire Category of skills, the cost is equal to the total expenditure for all the individual Areas, minus a 40% discount. (Round the discount down before applying it.)

Example: You have starting skill only in all Sciences (#400), and want to put 4 SP into each of the 13 Areas within that Category. The individual cost would be 52 (13×4 SP each); the 40% discount is 20.8, rounded down to 20 SP. The net cost is 32 SP; after spending that amount, you have a score of 5 in each of the 13 skill Areas of the Science category.

No additional discount applies if you acquire an entire Division. Simply do the calculations for each Category only. You may not purchase a Category if, in doing so, the total number of Areas would exceed the character's Mental Capacity.

Step 6: Other Details

Select all other character details as you did with the Basic method. A checklist is provided here for your easy reference. In the Advanced game, proper role-playing is of even greater importance, and you should specify all the details needed.

Physical details include height, weight, sex, age, race, color & style of hair, eye color, handedness, etc.

Historical information includes name, birthplace, past residences, current home, economic & social background or class, friends & family, current & past professions, noteworthy experiences, etc.

Psychological traits include overall nature & personality, likes & dislikes, good & bad habits, and preferences as to colors, music, friends, and surroundings.

Step 7: Add CC Details

As shown in the box at the top of the next column the formulas for calculating data based on the Physical Stat are slightly different from those in the basic

Stat-based Data

Dmg = Physical Capacity + 10.
Heal = Physical Recovery + 10.
IP = Physical Integrity x 3.

Heft (by measurement system used, but each based on Physical Capacity):

English System

Throw = Physical + 2
Carry = Physical x 5
Lift = Physical x 10

Metric System

Throw = Physical Capacity
Carry = Physical x 10
Lift = Physical x 20

game method. (The built-in bonus for using the Metric system still applies.)

All terms have the same definitions as those given for the basic character. You still start with 200 Power Units.

Step 8: IPs by Location

Since you are making the Advanced game character, the Hit Location system is highly recommended for combat. If you do not intend to use it, you must now go back and revise your IPs, to Physical Integrity x2 (not x3). If you are going to use the HL system, don't change the IPs; use the higher figure for the following calculations. Write the results within the box labeled "IPs by Location," using the left column (Original). When your character's body parts are damaged in combat, write the revised totals on the right (Current).

Divide your total IPs by ten, and round down. Write that result in each space except the one labeled "Body." Add all those figures, subtract the total from the original total IPs, and write the remainder next to Body. Double-check by adding all the body part IPs; the total should match the original IPs. If it does not, recalculate.

Your Advanced game character is now ready to go. Check to be sure that every space on the character sheet is filled in, except for the boxes labeled Reserve SP and Current Totals, IP and EP, which are for use during the game.

Converting Characters

At some point in your CYBORG COMMANDO game, you will probably want to change an existing Basic character to an

Advanced type. Use the following simple procedure.

1. Review the Advanced rules

Be sure you are familiar with the rules for creating a new character with the Advanced method before you try to switch an existing character. It may be helpful to create one or two new characters for practice.

2. Change the Skills.

Start with the first Field of skills chosen for the Basic character. Multiply the score in that Field by 3. Divide that number of points among the Areas within that Field. You must place at least one point in each Area, for a resulting minimum score of 2 in each, counting the one you get free. You are free to distribute any remaining points as you wish within that Field.

Use the same procedure to convert each remaining Field.

3. Change the Stats.

Multiply the current Mental Stat score by three. Divide that number of points among the three new Mental Stats (Capacity, Integrity, and Recovery), within the following limits:

- The Mental Capacity must equal or exceed the number of skill Areas (as found in step 2, above).
- Each score must be at least 5, but less than 100.

If you cannot obey both the limits, see "Exceptions," below. You may otherwise distribute points as you wish within that group of three Mental Stats.

Use the same basic method to convert the Neural and Physical Stats. The only limit is that each score must be at least 5.

Exceptions (Mental Stats): After you put a number of points into Mental Capacity to equal the number of skill Areas, you might not have enough points remaining to obey the limit (5 minimum) on the other two Mental scores. If this occurs, make the remaining scores equal or nearly so (differing by one point at most) at some number less than 5. If either remaining Mental Stat is zero, raise it to one. (No charge!)

4. Perform new Calculations.

Using the nine new Stats, copy or calculate each of the other details for the character. Refer to the Advanced character creation system (page 14) for specific instructions.

5. Add other details.

Try to add more detail to the notes about the character's physical, historical, and psychological traits. Write down the things that have come out while playing the character thus far, and create even more details.

The Character in Play

Now that you have created a character, you will play this role in CYBORG COMMANDO games. The character will do things, use skills, gain experience, and acquire further training. But change is usually slow, and is limited in various ways.

SP Record

Keep a record of your character's total SP on the back of the character sheet. The starting total is 60, the amount you spent for Stats and Skills; the extra amount from MadMac memory storage is not counted. The total does, however, include everything your character earns, even if some has been "spent" to make improvements and to acquire other assets (see below).

When the SP total reaches certain predetermined amounts, the character is eligible for promotion in the CCF. The character's Combat Rating also improves with rank. (Ranks, SP requirements, and Combat Ratings are given on page 48.)

SP Expenses

The SP earned during an adventure may be "spent" for equipment, or for improvements to Stats or Skills. Alternatively, SP may be saved for future purchases; you do not have to spend SP as soon as they are awarded.

Equipment

Most of the equipment used on a mission is simply handed out to the characters before they leave their base. There is often far less equipment than the characters want; novice CCs usually underestimate their capabilities. Even when a mission is exceptionally hazardous, the amount of equipment available is often minimal, simply because of the very limited resources in the post-invasion setting.

A character may use SP to "purchase" weapons and special equipment from a Primary base. When this occurs, the CC "owns" the equipment, and it can be carried and used as often as desired.

Since such a purchase essentially amounts to trading experience for material objects, you can imagine the proce-

dures in the following way. The character goes to a supply officer or other CCF staff member at the base (a normal human, not a CC) and asks what is in stock, or requests a specific item. In the course of the subsequent conversation, the CC tells the staffer a few stories about missions. The staffer decides that the CC has earned the privilege of getting and keeping the item, gives it to the character, and fills out the appropriate forms. No money changes hands, but the character has "spent" some of his or her reputation and experience (SP) in acquiring the equipment.

When your character "purchases" equipment in this way, be sure to note it on the character sheet. Such equipment is valuable and scarce, and will not be replaced if lost. Ammunition and supplemental power supplies, if needed, must be purchased separately. However, it is usually far easier to acquire ammo or batteries for a mission than it is to get extra weaponry.

Stats & Skills

Your Game Master will usually award 2-6 SP to your character at the end of each play session. You will normally be allowed to save these points or "spend" them in any way you choose for Stats or Skills, subject to two limitations:

1. If you want to raise any Skill that has a score of 10 or less, you must return to a fully functional Primary base. This represents the education required to gain the knowledge. You must also return to a Primary to raise a skill beyond each multiple of 10. Most of your skill gains come from experience in using the skills, but some must come from education.
2. If the GM awards SP in a specific Stat or Skill, those points can *only* be added to the value specified. This usually occurs immediately, as soon as the GM awards the SP. However, if education is required for the increase in Skill (according to rule #1 above), the SP are held in reserve until the character returns to a Primary base, and may not be spent for anything else.

If you choose to save SP awards instead of spending them, write them in the Reserve SP box on the character sheet. If an SP award is given for a particular Stat

or Skill, but education is needed before it can be applied, write it in parentheses next to the applicable score, and add it in when you are allowed to do so.

You can improve a Stat at any time and place; the character is never required to return to a base to do this. But whenever you change a Stat, be sure to check the other data which are calculated from that Stat and change them too.

The absolute maximum human score for any Stat or Skill is 99. This represents near-perfection, allowing only a 1% chance of failure in the Skill or Stat check. *Nobody's perfect* — not even in a single score.

Stat Checks

A Stat check is a die roll made when a character tries to do something that could either succeed or fail, depending on one of the character's innate statistics (as opposed to a learned skill). To make a Stat check, roll d10x. If the result is equal to or less than the value of the Stat being checked, the attempt succeeds. If the result is greater, the attempt fails.

Basic Game

The three Stats are used to determine chances of success in the following circumstances. Other similar situations are handled in the same way. The Game Master will decide which Stat is appropriate for a given situation.

Mental:

- resist psychological attacks, interrogation, mind-affecting drugs (such as truth serum), and so forth
- recall obscure information or details from the past
- recover from mental damage

Neural:

- keep control during extreme stress
- resist stun or knockout effects
- perform multiple actions at the same time
- reawaken when stunned or knocked out

Physical:

- exceed the normal limits of weight (lift, carry, throw), to an absolute maximum of twice the normal amount given

Advanced Game

Stat checks in the Advanced game are handled in exactly the same way as are those Basic game, except that the nine specific Stats now govern success, instead of the three Basic stats. The nine Stats are used to determine chances of success in the following circumstances. Other similar situations are handled in the same way. The Game Master will decide which Stat is appropriate for a given situation.

Mental Capacity: exceed the maximum number of skills by 1 (at most, and only temporarily; in any event, at the GM's discretion).

Mental Integrity: resist psychological attacks, interrogation, mind-affecting drugs, etc.; recall obscure information or details from the past.

Mental Recovery: recover from mental or psychological damage.

Neural Capacity: perform multiple actions at the same time.

Neural Integrity: keep control during extreme stress; resist stun or knockout effects.

Neural Recovery: reawaken when stunned or knocked out.

Physical Capacity: exceed the limits of

weight (lift, carry, throw), to an absolute maximum of twice the normal amount given.

Physical Integrity: Resist a "final blow" that would reduce IPs to zero and/or cause death (optional use, at the GM's discretion; if successful, 1 IP remains).

Physical Recovery: if severely injured, respond to treatment from those trained in medicine.

Skill Checks

A Skill check is a d10x roll made in exactly the same way as a Stat check. If the result is equal to or less than the Skill Rating being checked, the attempt succeeds. If the result is greater, the attempt fails.

A Skill check should be made whenever the action the character attempts is more dependent on knowledge or learning than on innate abilities (i.e. Stats). Your Game Master will decide whether or not a Skill is appropriate in a given situation, whether a check is needed in the first place, and whether to modify the roll, applying a temporary bonus or penalty to the Skill Rating because of unusual circumstances.

Changing the Character

Once you have decided on the character's physical appearance, these details should not be easily changed. After the CC regains his or her natural body, the character might diet to lose weight, dye his or her hair, or adopt a new hairstyle, but such changes should occur for specified reasons.

Historical details should not be changed at all. However, if you strongly want a change in the history — to something more appropriate for the character as played, to accommodate a special story line, or for some other reason — talk with your GM. Historical changes should be very rare, and should be made using some logical reason. (For example, the character might have *thought* that he was born in a certain city, and only now has the recovery of a long-lost hospital record revealed otherwise . . .) You may add to or change the psychological "other details" as you like, but once again, only with good reason.

By keeping a consistent image of the role you play, you will make your character more realistic than one that is changed constantly. Maintaining believable roles is a major factor in getting the most out of a role-playing game.



Skills

Space does not permit a full description of each Skill — indeed, such a description would fill many thousands of pages. Every bit of Man's knowledge can be classified into one of the following categories. Read through the entire list to become familiar with where everything is placed. Then select skills that correspond with what you want your character to know. You can also do it the other way around: think of some specific topic, and then find the skill that includes it.

Every character has a Skill Rating of 1 in every skill because of the intensive training given to every new recruit who intends to become a CC. This rating indicates general familiarity with each topic, not expertise.

The exact skills used vary by whether you are using the Basic game or the Advanced, as explained below.

Selecting Skills

Try to plan carefully and select skills that the character would desire and/or find useful. You may freely choose any skill area or field as per the instructions below, but you may only purchase a Psychogenic skill if your character has 1 or more Psychons of psychogenic power.

Basic game

Use SP to purchase Fields of skill, for which the number codes always end in tens (such as 110). Do not purchase Categories (such as 100) or individual skill Areas (such as 111, 112, etc.); these are for the Advanced game only. Each Field includes knowledge of all Areas within it.

Advanced game

Use SP to purchase individual skill Areas. See page 14 for guidelines on purchasing entire Fields, or even whole Categories. Note that Category 400 (Arts & Language) may be purchased by a character who has no psychonic score, but no psychogenic skills (460) are conferred thereby.

Using this System

When your character performs some

action or tries to recall and/or use some knowledge, the success of the attempt may be automatic (for simple things) or decided by a Skill check (for trickier matters). For example, every character can use a normal computer in the usual ways, but writing a program or breaking through a computer's security defenses would require a Skill check.

To make a Skill check, roll d10x. Add or subtract modifiers if the GM decides that the attempt is easier or harder than a normal check would indicate. If the result is equal to or less than the character's Skill Rating, the attempt succeeds. For Dynamic skills, this usually means that the attempted action is performed; for Static skills, knowledge is recalled and successfully applied to the situation.

Whenever a question arises as to which Skill applies in a given situation, or which covers a given bit of knowledge, the Game Master will decide. In every debatable situation, add notes to the skill list about the decision made.

Skill Descriptions

Unarmed Combat (Dynamic; #220)

This skill is unusual in that it provides specific abilities which increase by the Skill Rating. Some of the abilities (explained as "Special") apply only after a successful skill check is made, but all others apply automatically.

As the Skill Rating reaches each level on the following table, the indicated ability is acquired. Damage & Attack bonuses are cumulative; for example, a character

SR	Abilities
5	Parry/dodge +10, and Special (see below)
10	Damage bonus +5
15	2 attacks
20	Stun 70+
25	Attack bonus +5
30	Parry/dodge +20
40	Disarm
50	3 attacks
60	Stun 50+
70	Damage bonus +5
80	Parry/dodge +30 & Attack bonus +5
90	4 attacks
99	Double damage

with SR 70 has bonuses totalling +10 to the attack roll and +10 additional damage.

Specials are specific abilities that vary by the Skill Area (221 or 222), as follows. In the basic game, only area 221 is used.

Occidental Specials

Grapple: The opponent is immobilized but not thrown to the ground.

Pin: The opponent is immobilized and thrown to the ground.

Squeeze: Damage (as given on the character sheet) can be applied, at the attacker's discretion, if the Pin or Grapple attempt succeeds. No skill check is required to squeeze for damage, as long as the grapple or pin succeeded.

Escapes: Whenever the attacker succeeds at a pin or grapple, the defender may attempt to escape. If the attacker squeezes, the damage is applied before the escape attempt. Subtract the attacker's Physical score from the defender's; the result is the percentage chance (d100) of such an escape. If the attempt fails, the escape attempt may be repeated in the next appropriate phase.

Oriental Specials

These actions may be used to achieve results of damage, stun, and movement, as follows. The results apply automatically if the initial skill check indicates success.

Karate kick: Damage & stun. The damage indicated on the character sheet (1/10 Physical score) is inflicted.

Judo flip: Move & stun. The defender is either moved to the ground with no lateral movement (throw) or moved up to 2 meters/yards in any direction (flip).

Throw: Move & damage. See below for effects.

Automatic effects (no check needed)

Attacks (2, 3, or 4): The character may make this number of unarmed attacks (of any type) in a single combat phase.

Attack bonus: Apply the indicated bonus to the attack roll (affecting both the chance to hit and damage).

Damage bonus: Apply the indicated bonus to damage, but only if the attack succeeds.

Parry/dodge: Apply the DV bonus indicated when an incoming attack could conceivably be parried or dodged. Light attacks cannot be parried except with a reflective object. Impact and Thermal at-

tacks can often be dodged, except for bullets, which can only be dodged or parried by using ultraspeed. Other attack forms can only be dodged.

Stun (any): If the attack hits, the defender is stunned (immobile and defenseless), but may make a Neural Stat check at the end of each CT (in phase 10) to recover. The maximum stun duration is a number of phases equal to the attacker's SR; the victim recovers automatically after that duration, regardless of Neural Stat check results.

Psychogenics (Dynamic: Category 300; Static: Field #460)

The science of psychogenics grew from intensive CCF research programs created for the purpose of investigating various allegations of occult practices, including "extra-sensory" phenomena. Their goal was simple: prove or disprove the allegations, once and for all, in a strictly scientific investigation. The results forever cast certain aspects of the subject into the realm of myth and legend, but they also proved the reality of others.

The use of any psychogenic skill requires the expenditure of mental strength, measured in units called psychons. The extent of the effect is usually determined by the number of psychons expended.

Psychons expended may be recovered, but the process is irregular. The player makes a skill check once at the end of each Standard Turn (14.3 minutes); if successful, the character immediately recovers a number of psychons equal to 1/10 the Neural Stat (rounded up).

Dynamic Psychogenics

For each of the following quantities to be affected, one psychon must be expended. For example, to affect a 50-gram mass, 5 psychons must be expended.

Effects Per psychon:

- 310. Matter
 - 311. Hard objects: 1 gram
 - 312. Soft objects: 10 grams
 - 313. Liquids: 1/10 liter/quart
 - 314. Gases: 1 cubic meter/yard
- 315. Properties
 - Colors: 100 square centimeters (16 square inches)
 - Shapes: as object (above)
 - Smells: as gases (above)
- 320. Energy
 - 321. Heat: 10° C (18° F)
 - 322. Light: 10 lux
 - 323. Molecular / atomic: 1 rem
- 330. Beings: See below.

Beings (#330)

331. Animals: Nearly complete control is obtained, and multiple beasts can be affected simultaneously. The cost is 1 psychon per Mental Stat point (of the animal, or total of all animals) per Active

Turn. The minimum duration is 1 combat phase (1/10 CT).

332. Individual thoughts: Affecting a single thought in a single human is relatively simple, and has correspondingly minor effects. Unconscious thoughts or actions cannot be affected, but a specific thought or emotion can be changed. The cost is from 1-20 psychons, at the GM's discretion, varying by the intensity and scope of the thought or emotion.

333. Entire human beings: Control over a person can produce movement in one body part (only), or very limited paralysis of the entire creature. The cost is 1 psychon per Combat Turn per point of Mental Stat (of the victim). The minimum duration is 1 combat phase (1/10 CT). However, if the victim has this skill, he or she becomes aware of the attack immediately, and can avoid it entirely by making a Skill check and expending a number of psychons equal to half the amount spent on the attack.

334. Groups: The actions and emotions of a group can be affected, but not those of specific individuals involved. The cost, 1-500 psychons, varies by the scope of the effect (GM's discretion).

Static Psychogenics

The GM finds a percentage based on the degree of the effect (explained below) and rolls d100. If the result of the roll is equal to or less than the percentage, the communication is completely clear; it otherwise has gaps, missing some of the desired information (the exact "holes" being left to the GM's choice).

Restricted effect. The percentage is equal to the number of psychons expended.

Full effect. The percentage is equal to half the number of psychons expended.

Other Skills

211. Personal Tactics (initiative): Apply this skill to combat situations in which the same weapon type is being used by two or more combatants. If the CC's check succeeds, his or her attack is resolved first. In case of multiple simultaneous successes, the lowest roll goes first. Only if the rolls are equal are the attacks resolved simultaneously, as in a normal combat phase.

220. Unarmed Combat: See page 18.

300. Psychogenics: See left.

411. Mental Arts (learning techniques): This skill is used whenever the character attempts to learn (i.e., increase a Skill Rating). If the check indicates success, the time required is half normal.

421. General Creativity: This skill is never used alone, but is instead applied along with some other skill(s). If the check is successful for all the skills involved as well as this one, the CC is not bound by the

established knowledge of the other skills, but can invent or create something new. For example, a person who succeeds in checks of this skill, #137 (small Spacecraft), and #552 (Energy sciences), even with considerable penalties on all rolls, could actually invent the galactic space drive used by the aliens.

441. Single Language Use: This skill applies to only one language (e.g. French or German), which must be named by the character when the skill is purchased. Extraterrestrial languages cannot be learned without an alien tutor of sufficient expertise. The skill with which the language may be used is determined by the Skill Rating, as given on the table below.

A failed skill check indicates that the achieved level of expertise is that of the next lower rating. For example, a failed check of a 21-50 SR indicates that basic communication can still be maintained, but no extensive vocabulary can be used.

SR Degree of expertise

2	Very common terms only
10	Simple sentences, grade-school vocabulary
25	Fluency: complex sentences, extensive vocabulary
50	Expertise as if native, including accent, idioms, & dialects
99	Complete mastery, as if a highly literate native

442. General Linguistic Skill: This skill may be applied to all languages that the character has not studied by way of Skill #441. Though it does not convey the ability to use the language, a successful check indicates that the general meaning of some spoken or written communication can be translated. Details may easily be missed in the process; the message is only translated in a very general sense.

450. Psychogenics: See page 18.

Skill List

A. Dynamic Skills

100. Movement

110. Personal movement (6 areas)

- 111. Land-based, normal
 - Climbing and mountaineering
 - Running, sprinting, and jogging
- 112. Land-based, special
 - Acrobatics (backflip, cartwheel, leap, fall, tumble, roll)
 - Gymnastics (rings, single & parallel bars, trampoline)

- 113. Aquatic, unequipped
 - Diving
 - Rescue techniques (basic)
 - Swimming
- 114. Aquatic, equipped
 - Underwater swimming, navigation
 - Deep-sea exploration techniques
- 115. Aerial (non-powered)
 - Hang-gliding
 - Skydiving
- 116. Extraterrestrial
 - Deep space maneuvering
 - Low-gravity movement
 - High-gravity movement
- 120. Mounted movement (2 areas)
 - 121. Land mounts
 - Care
 - Training
 - Limits
 - Proper uses
 - 122. Aquatic mounts (as above)
- 130. Vehicular movement (8 areas)
 - Each including driving/piloting, navigation, and repair
 - 131. Landcraft, small
 - All-terrain vehicle (ATV)
 - Automobile
 - Bicycle
 - Cart (animal-drawn)
 - Jeep
 - Motorcycle
 - Van
 - 132. Landcraft, large
 - Wheeled
 - Half-tracked
 - Tracked
 - Hovercraft
 - 133. Watercraft, small
 - Motorboat (with inboard and outboard engines)
 - Oared and poled boats & barges
 - Sailboat
 - 134. Watercraft, large
 - Hydrofoil
 - Surface vessel (battle, cargo, etc.)
 - Submarine
 - 135. Aircraft, small (one or no engine)
 - Glider
 - Helicopter
 - Combustion engine types
 - Ultralight
 - 136. Aircraft, large (multi-engine)
 - Combustion engines
 - Jet engines
 - Rocket engines
 - 137. Spacecraft, small
 - Fighter, small
 - Personal jetpack
 - 138. Spacecraft, large
 - Fighter-bomber
 - Transport

200. Combat

- 210. Strategy & tactics (3 areas)
 - Also see 620 for misc. related skills.
 - 211. Personal tactics
 - Initiative, surprise, & ambush

- 212. Personal strategy
 - Situation analysis
 - Guerrilla warfare techniques
 - Pursuit
- 213. Military S&T
 - Deployment of materiel
 - Deployment of personnel
 - Field tactics
 - Identifying enemy personnel and insignia
 - Military history, ancient & modern
 - Military operational methods
- 220. Unarmed Combat (2 areas)
 - 221. Occidental style
 - 222. Oriental style
- 230. Personal Weapons (6 areas)
 - 231. Ancient bladed melee weapons (including agricultural tools)
 - 232. Ancient blunt melee weapons (including agricultural tools)
 - 233. Ancient missile weapons
 - Personal (bow, crossbow, sling)
 - Artillery (ballista, catapult, trebuchet)
 - 234. Common devices as weapons
 - Chain (and related ancient weapons)
 - Tools (saw, drill, screwdriver)
 - Rope and lasso
 - Wire and garrote
 - "Booby traps"
 - 235. Modern small arms
 - Grenades
 - Light projector (e.g. laser)
 - Sound projector
 - Radiation sprayers (microwaves, X-rays, alpha & gamma particles)
 - Projectile guns (submachine gun, pistol and revolver, rifle)
 - Specialty guns (tranquilizer, grapple and rope, plus others)
 - 236. Heavy and Special weapons
 - Machine gun
 - Missile (rocket)
 - Missile or grenade launcher
 - Mortar
 - 237. Artillery
 - Cannons
 - Guns
 - Howitzers
 - Rocket Artillery
- 240. Mass Weapons (4 areas)
 - 241. Grenades & explosives
 - Fuses and timers
 - Handling & storage
 - Mines
 - Plastic explosives
 - Primitive & modern grenades
 - Range & blast radius estimation
 - Shaped charges
 - 242. Biological (bacteriologic & viral) and genetic (radiation, super-virus, pharmaceutical)
 - 243. Chemical (poisons) and ecological (environmental sabotage, resource pollution)
 - 244. Nuclear (fission and fusion; microwave, gamma radiation, neutron emitters)

300. Psychogenics

- 310. Matter (5 areas)
 - 311. Objects, hard (lithotropics)
 - 312. Objects, soft (pelotropics)
 - 313. Liquids (hydrotropics)
 - 314. Gases (aerotropics)
 - 315. Properties
 - Colors (chromatropics)
 - Shapes (morphotropics)
 - Smells (osmetropics)
- 320. Energy (3 areas)
 - 321. Heat (thermotropics)
 - 322. Light (phototropics)
 - 323. Molecular & atomic energy (monotropics)
- 330. Beings (3 areas)
 - 331. Animals (zootropics)
 - 332. Individual human thoughts (phrenotropics)
 - 333. Entire human beings (homotropics)
 - 334. Groups of people (ethnotropics)

B. Static Skills

400. Arts & Language

- 410. Personal arts (3 areas)
 - 411. Mental arts
 - Adapting to change
 - Education (learning techniques)
 - Emotional control
 - Evaluating others
 - Gullibility and sophistication
 - 412. Physical arts
 - Grooming and wardrobe
 - Physical control (poise)
 - Pre-planning reactions
 - 413. Error Avoidance
 - Creating optimal situations
 - Karma & fate (kismet)
 - Maximizing options
 - Recognizing opportunities
 - Serendipity
- 420. Creative arts (5 areas)
 - 421. General Creativity
 - Extrapolation & invention (combines with other skills)
 - 422. Domestic arts I (active)
 - Cooking
 - Minor household repairs
 - Parental skills
 - Sewing & tailoring
 - Sex
 - 423. Domestic arts II (passive)
 - Entertaining guests
 - Household organization
 - Housekeeping techniques
 - Insurance needs & householder liabilities
 - Interior decoration & color theory
 - 424. Graphic & communications arts
 - Film
 - Literature
 - Drawing & painting

- 425. Performing arts
 - Acting (dramatic, comedic, other)
 - Dancing
 - Music (composition, instrumental, vocal)
- 430. Cultural arts (4 areas)
 - 431. Cultural Philosophy
 - Customs vs. laws
 - Religions
 - 432. Cultural Practices
 - Classes and communities (ethnic, educational, financial, social)
 - 433. Philosophy
 - Philosophies of the individual
 - Philosophies of various cultures and eras
 - 434. Psychology
 - Advertising
 - Marketing and merchandising
 - Management techniques
 - Psychology theory
 - Superstitions & beliefs
- 440. Languages (3 areas)
 - 441. Single language use
 - 444. General linguistic skill or talent
 - Affects all languages seen or heard
 - 445. Nonverbal languages
 - Body language
 - Sign language
 - "Touch" languages (braille et al.)
- 450. Communications (4 areas)
 - 451. Strategies
 - Diplomacy
 - Friendships (developing & maintaining)
 - Leadership techniques
 - Romance
 - 452. Tactics
 - Conversation
 - Evaluating communications
 - Interrogation
 - Persuasion
 - 453. Simple (non-electrical) communications devices
 - Flag signals
 - Light signals
 - Object symbology (arranging objects to convey meanings)
 - Smoke signals
 - 454. Electrical communications
 - Laser
 - Microwave
 - Radio
 - TV/video
- 460. Psychogenics (5 areas)
 - 461. Visual Reception
 - Restricted Clairvoyance (through others' eyes)
 - Full Clairvoyance
 - 462. Audial Reception
 - Restricted Clairaudience (through others' ears)
 - Full Clairaudience
 - 463. Empathy
 - Restricted Empathy (emotional sensing)
 - Empathy Exchange (emotional sending & receiving)
 - 464. Sending (one-way telepathy)
- 465. Full communications (interactive telepathy)
- 500. Sciences
 - Mathematics included as needed.
- 510. Computer sciences (3 areas)
 - 511. Ancient computers
 - Mechanical & electrical
 - Early programming & hardware
 - 512. Modern operation and software
 - Programming
 - Systems penetration
 - 513. Modern Hardware
 - Repair & sabotage
- 520. Medicine & Health (7 areas)
 - Each includes details of Accidents (common forms, first aid techniques), Anatomy, Biology, Diagnostics, general Health (exercise, nutrition, etc.), related Laboratory work, Medical discipline & philosophy, Pathology, Pharmacology, and assorted Treatment techniques. All Areas except 526-527 relate to humans.
 - 521. General medicine
 - 522. Psychiatry
 - 523. Obstetrics & Gynecology
 - 524. Osteopathy (including dentistry)
 - 525. Surgery
 - 526. Veterinary medicine, land & air creatures
 - 527. Veterinary medicine, marine
- 530. Terrestrial sciences (7 areas)
 - Including ecologies, environmental details, hunting, & survival skills
 - 531. Aquatic, fresh water
 - 532. Aquatic, salt water
 - 533. Forest
 - 534. Mountain
 - 535. Desert
 - 536. Plains
 - 537. Polar
- 540. Extraterrestrial sciences (2 areas)
 - Including survival skills and known ecosystems
 - 541. Space environments (vacuum, low gravity, etc.)
 - 542. Alien environments & life forms
- 550. Energy sciences (2 areas)
 - 551. Air, Light, & Sound
 - Acoustics
 - Aeronautics
 - Aerodynamics
 - Optics
 - Meteorology
 - Others
 - 552. Energy sources
 - Atomic and nuclear energy
 - Chemical energy & sources
 - Electricity & Electronics
 - Energy of rotation and revolution
 - Fossil fuels
 - Geothermal energy
 - Gravity
 - Hydropower
 - Magnetism
 - Solar energy
 - Tidal and wind energy
- 560. Physical Sciences (2 areas)
 - 561. Earth sciences
 - Chemistry (organic, inorganic, physical, analytical)
 - Crystallography
 - Geology
 - Mineralogy
 - Metallurgy
 - Seismology
 - Others
 - 562. Mechanics
 - Civil engineering (construction)
 - Mechanical engineering
 - General repair skills (jury-rigging, disassembling, & fixing anything)
- 600. Law
 - 610. Enforcement (2 areas)
 - 611. Investigations
 - Ballistics
 - Clues
 - Counterintelligence
 - Judicial & legislative systems
 - Legal terminology
 - Observation techniques
 - 612. Suspect & prisoner handling
 - Tailing
 - Arresting (& suspect rights)
 - 620. Misc. related skills (3 areas)
 - 621. Hiding and stealth
 - Camouflage
 - Getting & using documents
 - Hiding yourself (including disguise & impersonation)
 - Hiding objects
 - Moving quietly or silently
 - 622. Escaping & evading
 - Confusion & distraction
 - Evading a faster pursuer
 - Destroying sensory tracks
 - 623. Gambling & illusions
 - Games of chance (including techniques & detection of cheating)
 - Organized gambling
 - Prestidigitation (slight of hand)
 - Large-scale illusions
 - 630. Criminal activities (4 areas)
 - 631. Criminal subculture
 - Bribery
 - Lying
 - Planning large-scale theft
 - "Streetwise" knowledge
 - 632. Non-confrontational crimes
 - Counterfeiting & forgery
 - Embezzlement
 - Lockpicking & safecracking
 - Pocket picking
 - Racketeering
 - Smuggling
 - 633. Confrontational crimes
 - Con games
 - Extortion
 - Kidnapping
 - Robbery
 - 634. Vice
 - Drugs
 - Sex-related crimes

The CC Body

After becoming a CC, your character is still quite human mentally, but much more physically. The following is a general overview of how your new body is built and what it can do. All of these details are explained fully in the Tech section, which starts on page 32.

Your character is now a blend of three separate parts — the human brain, a computer, and a mechanical body. Though the procedures for returning the brain to its natural body are not yet perfected, that should be possible within a year or two. The old body has thus been carefully preserved, and is stored safely in liquid helium.

The perceived ideal CC design is one in which an intact and whole character may ride within a CC body and mentally control it. The realization of this goal is still in the future, but it may be possible by 2037. The revised form will be called the CYBORG CHAMPION™ unit.

The Brain & the Computer

A large non-magnetic metal capsule within your CC's chest (about 74 cm long and 36 cm wide at the center, or 29" x 14") contains one human brain, several supplementary glands to provide necessary hormones, life support mechanisms, and a computer called "MadMac."

The capsule's self-contained life support system has its own supply tanks for food and oxygen. The food supply is a sealed system, but the character breathes most of the time. The food tanks contain sufficient food for about three years of operation. The oxygen supply is sufficient to maintain the brain and glands for about one year if external oxygen is unavailable.

The very small but extremely complex computer used in all CCs was made possible by superconductive circuitry. This computer is called the Miniaturized Analog/Digital Macro-Algorithmic Computer (M A/D M-A C, or "MadMac").

MadMac handles all the automatic operations of the mechanical body. It also provides additional memory for the brain's use. This "Pseudomemory" is treated the same as the the brain's own memories; the character literally cannot tell the difference between the two types. Because of this, the character cannot learn the skills stored in the MadMac — at least not directly from the computer. In the rare case of computer damage, the pseudo-

memory may be temporarily inaccessible. The knowledge in the organic brain must then suffice until the damage is repaired.

The human brain and the MadMac are connected to the rest of the body by a device called the Sawtell SINC (Sub-cranial Interface and Neural Converter). This converts nerve impulses into signals the computer can understand, and vice versa, and routes all commands to the body.

Power Supplies

All CC functions run from electrical power. The power sources are located in the upper and lower torso of the body.

Primary Batteries

All functions of the CC body use power from chemical storage batteries mounted in the lower body. These primary batteries store a total of 200 Power Units (PU) of electricity. The batteries are relatively easy to replace, and this is standard procedure whenever a CC returns to a supply base, as part of routine maintenance.

Primary batteries are recharged or replaced frequently, since a CC is often very active. Power scavenging during field operation is common (see details at right).

Secondary Batteries

The brains capsule contains its own Secondary batteries for its exclusive use. If the Primary power reaches zero PU, the life support system automatically switches to the Secondary supply. The brain goes to sleep automatically, to conserve power. Using a tiny amount of power from its own Tertiary batteries (see below), MadMac then watches for the return of power to the Primary batteries. The sleeping brain can survive for 180 days on the Secondary battery, but expires quickly when that power is gone.

Tertiary Battery

MadMac has its own battery. This supplies only a trickle of current, barely enough to maintain MadMac's existence, but it can do so for about 50,000 hours (5.7 years). MadMac's memory remains intact while on trickle power, though it can only be reached by using Primary or external

power. After Tertiary power runs out, MadMac's memory begins to degenerate slowly, vanishing completely in 7-8 years.

Zero Power

A CC with zero PU appears as an inert hulk, whether or not internal systems are still operating. Another CC may contact the unit's MadMac by finding the proper circuit and feeding in an identification code. All MadMacs are assumed to know these identification codes; players need not discover or memorize them.

Power can be fed into the hands, feet, or neck. MadMac will use 1 PU of the incoming power to scan the situation, and to make several decisions — whether it should power up the rest of the CC body, awaken the organic brain, and/or take immediate defensive or hostile actions. It will not reawaken the brain until the power level exceeds 10% of normal (20 PU).

Recharging Power

A character can recharge the Primary batteries simply by touching two power leads or battery terminals with any digits (fingers or toes) on any two limbs. The power is automatically channeled from there into the Primary batteries.

Power can be tapped from nearly any electrical source, such as car batteries, electrical power plants, and possibly even fallen enemy aliens (if their power sources can be found). Whatever the source, the maximum recharging rate for the primary power batteries is 7 PU per minute (1 PU per Combat Turn).

Movement

The frame of the CC body is made of a very strong aluminum alloy that is lightweight, durable, and not subject to magnetism. Its joints can move in directions similar to those of a human's, though often with greater flexibility.

The standard mechanism for most joints combines rotation and pivoting. Joints that only pivot are used for the 28 knuckles of the body (2 per finger, 1 per thumb, 1 per toe) and at the ten places where the digits connect to the hands and feet. The neck, however, rotates at the body but pivots at the base of the skull.

Body movements require no more

concentration than did those of the character's original organic body. The speed of such actions is normally determined by the organic nerves (represented by the Neural Stat), although control can be delegated to MadMac for faster reactions (see Autopilot, below, and Ultraspeed, under Defenses, page 24).

A CC normally moves on foot across land surfaces in the same way as a normal human. The body can be made watertight for surface or subsurface operation as well. No flight capacity is included, but long and/or high jumps are possible by using additional power in the leg systems.

Autopilot: MadMac can be told to handle the details of moving the body. It then uses light and radar to scan the area around the CC, and automatically avoids obstacles. The autopilot is costly in power (5 PU per CT), and the lights and radar are often easily detectable by other creatures.

Senses

A CC has the same five senses as a human, though of greater sensitivity and range, as explained below.

Sight

Each eyeball has four lenses, each corresponding to a different type of sight: (1) X-rays, (2) ultraviolet light, light visible to humans, and infrared light, (3) microwaves, and (4) television and radio waves. The eyes can operate independently, so the character can use any combination of two lenses at a time.

Large 10 cm (4") floodlights are in the front upper thighs, and small infrared and ultraviolet lamps are built into the front shoulders. X-ray tubes in the mid-torso just above the waist (left and right front) project very short and narrow beams. These lamps are normally unseen, covered by panels in the pseudoskin.

By cupping either hand, the CC can form a diaphragm under the skin into a miniature version of a conventional microwave or radar unit, and use it to emit radar and other signals. Many small-scale scans and tests can be made with these devices. For example, two CCs working in concert (one emitting signals, the other receiving) can examine the contents of a container, such as a shipping crate or bomb, without opening the container and in many cases without even touching it.

Hearing

A CC's ears can detect sounds in a very wide range of frequencies, but the character normally hears only those sounds that a normal person would, thanks to a digital encoding and filtering

system. The character can instantly shift to any portion of the total spectrum. The MadMac can analyze sound reception and thus duplicate sonar.

A CC can produce sound with three projectors. One is a simple diaphragm in the back of the mouth, which can produce a range of sound similar to a normal human's voice. The other two projectors are the same subskin palm units used for microwave and radar projection.

Smell, Taste, & Touch

These senses work in the same ways for a CC as for a human, though by mechanical rather than biological means. The head is filled with equipment designed to intake and analyze substances, collectively known as the "sampler."

The sampler is basically a miniature chemical laboratory. When air contains potentially hazardous elements, none of it is routed to the brain. Instead, the sampler reports the results of analysis to the brains. A CC can thus smell poison gas, for example, without being affected by it.

Solid and liquid material can also be taken in for analysis. Anything retained is sealed in one of the many small storage compartments of the head. The sample can be as large as 1 cubic centimeter.

Sensors in the skin and throughout the body allow MadMac to monitor all operations and inform the character of malfunctions and damage. Simple pain, the alarm system of the human nervous system, is almost nonexistent in a CC.

Defenses

The many defenses built into a CC body are designed to cope with nearly any danger or attack form. These dangers and the corresponding defenses are listed alphabetically below.

Acid: A CC's outer skin is resistant (though not immune) to acidic corrosives.

The typical defense against such an attack is evasion, though water may sometimes be used to dilute the corrosive.

Electricity: All of the electrical circuits which make up the CC's "nervous system" are made of superconductors, protected by coaxial shielding. The microcircuitry within and near MadMac is protected by a specially designed shielding material.

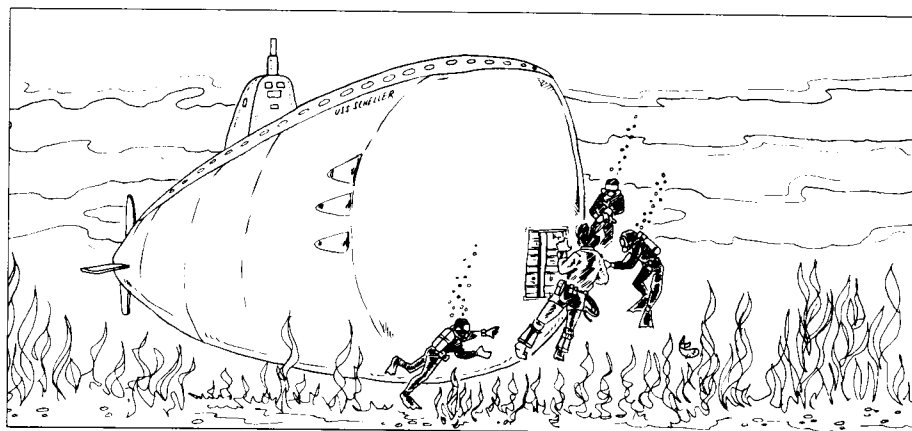
Electromagnetic Attacks: The CC body can use an Electro-Magnetic field generator — called the "Emmer" or "Emmer net" — to project a magnetic field around the body at a maximum range of about 1 meter/yard. This helps deflect various radiations, such as gamma rays and microwaves. It also blocks all electronic communication. MadMac activates the Emmer when it is needed. The field can also be kept up continuously if desired, at a cost of 1 PU per CT, and even extended, doubling both radius and cost.

Impacts: The CC defense against impact damage is similar in principle to that used in the 20th century "bulletproof vests," though vastly improved with a new material called Bufragel. A Bufragel layer lies between the pseudoskin and the Emmer net, and dozens of small piezoelectric crystals are embedded in it. Some of the energy of impact is thereby converted into electrical power, providing some (minimal) recharging whenever the character takes damage from an impact. The recharging rate is 1 PU for each 10 points of impact damage, rounded down.

Light: The pseudoskin of a CC is polarized and heat-resistant, and blocks most potentially damaging light-based effects. A CC's eyes cannot be affected by flashes; glare is automatically filtered out.

Laser attacks can easily be reflected, and hand-held "mirror shields" of various sizes provide inexpensive defense. Once the position of an attacking laser is known, further attacks can often be deflected. With foresight and luck, an incoming laser blast can sometimes be reflected back on the attacker with minimal loss of energy.

Smoke: This common tactical substance hampers visibility. Hot smoke



blocks infrared scanning, and radioactive smoke blocks most other scanner frequencies. All types block laser use. Smoke is particles suspended in the air, and can be countered by electrostatic means. Common in industry, this technique uses charged plates or rods to attract the particles and remove them from the air. If conductive metal objects are nearby, a CC can create an unsophisticated but effective electrostatic precipitator. By expending 1 PU per 5 cm (2") of material per minute of use, a CC can cleanse 10 cubic meters/yards of air per 5 cm of electrode per minute of operation by precipitating the particles from it. The total length of both electrodes must be accounted for.

Sound: There is no automatic defense against a sonic attack. A character may project sound which is the "opposite" of the incoming sound attack, partially or totally blocking it. The amount of power needed varies by the volume of the incoming sound, but typically (for battlefield sonic weapons) only 2-5 PU is required.

Thermal effects (heat & cold): Subsurface circuits and tubes heat and cool the body as needed, usually as directed by MadMac. This system can function very quickly, changing skin temperature at up to 120° C (248° F) per second. The system is located in the outer skin, immediately below the surface.

Ultraspeed

As an added defense against impacts, MadMac contains an ultraspeed program. The power cost to use ultraspeed is 20 PU per CT. In this mode, the body moves much too fast for the brain to grasp, and it is thus controlled entirely by MadMac. The speed and number of actions possible are five times normal.

In ultraspeed, MadMac uses any and all means available to destroy, stop, or deflect incoming projectiles. Internal lasers are its main tools for this, since other attack forms are relatively slow. However, MadMac can shoot bullets from a gun (if carried) to precisely collide with incoming bullets, destroying or deflecting them.

Ultraspeed is normally run for a predefined duration, which the character may set in any of several ways — the amount of power used, a time interval, number of missiles countered, etc.

Ultraspeed will automatically disengage if the primary power level drops below 10 PU. The program automatically fails to run, giving a warning message, if the power level is already below that. This can be overridden by the character, if desired. If the warning is ignored and the program run, Ultraspeed will use any and all remaining power, as needed.

Attacks

A CC's built-in (inboard) attack modes use light, sound, and sheer electrical force. Each weapon use thus requires spending some amount of power. Read range units as either meters or yards, whichever you are using in the game. Movement penalties are explained in the Combat section (page 25).

Electrostat

Power Cost: 10 PU

Range: up to 3

Damage: shock (Neural stat check) for 1-10 CT

Movement Penalty: 2

A CC can cause an electrical charge of high voltage to accumulate on the first finger of either hand. This is a variable and unstable attack form at best, since the charge will occur as a "lightning bolt" effect as soon as the it can jump to the nearest grounded substance. It can be effective at close range, but cannot usually be directed against a target more than 3 meters/yards away. It causes little or no organic damage, but can have severe effect on neural or electrical systems.

Laser

Power Cost: 5 PU

Range: 1000 (line of sight)

Damage: standard d10x

Movement penalty: 1

A small laser is built into each forearm, and firing ports are located under knuckles of the two center fingers. With the arm and hand in the proper (aligned) position, the ports open and the lasers can fire. The hand position is sometimes called the "eagle claw" in martial arts training.

Each laser is of standard type, emitting a narrow beam of light. A double burst is normally used (5 PU), lasting about 1/10 second. Such a burst will burn through 3-6 meters/yards of unprotected organic material. Typical armor accounts for 2-4 meters' worth. If the beam is concentrated for 1/5 second (10 PU) it can burn through up to 1/3 meter/yard of brick wall; a full second (50 PU) will penetrate 5 cm (2 inches) of solid steel.

Microwave

Power cost: equal to range

Range: 1 to 100

Damage: standard d10x

Movement penalty: 1

A CC can produce a microwave beam by aiming one or both palm projectors at a target. Damage is inflicted by heating the

target. The power cost (in PU) is equal to the range (measured in standard units).

Sonic

Power Cost: 10 PU per combat cycle

Range: 50

Damage: standard d10x

Movement penalty: equal to cycles required (see below)

The diaphragms in the palms of the hands can produce this attack form. Every object vibrates at some frequency, which is called its natural resonance. An object will vibrate when subjected to sound impulses of the same frequency. The principle of this attack form is the same as that of a singer shattering a glass.

Sonic attacks are time-consuming but do not use much power. The noise need not be loud, but must be accurately aimed and of the proper frequency. Both hands are normally used. Two CCs may cooperate, each using one hand; if so, the power cost is divided between them.

If the target is made of a familiar substance, damage can be produced within the same cycle of the Combat Turn. If the material is unfamiliar, the resonance must be found, and the sound must be projected for another 5 phases (1 extra cycle). The use of a single palm projector may result in insufficient power application, for no effect unless the target is very near (within 3 meters/yards).

Other Weaponry

Any CC can use various external attack devices, of course. Nearly any thrown object can cause physical damage to a target. Guns are also quite handy; see Weapons (Adventures booklet) for details. The inherent disadvantage in all such things, of course, is their limitations; guns require ammunition, and are of little use when that ammo runs out.

If the weight of an object is equal to or less than the amount noted on your character sheet under Heft, it can be thrown to a range equal to that number, and inflicts that same value as a fixed damage.

Tool Kit

This is not exactly a weapon, but can be quite convenient in a variety of situations. The index finger of each hand contains a blade and a chisel, and the little finger contains a drill using interchangeable bits. Each tool may be extended to a maximum length of 10 cm (3.9 inches). The chisel doubles as a screwdriver, and the blade is as sharp as a good scalpel and a thousand times as durable. The drill uses four interchangeable bits of 1, 2, 4, and 8 millimeters in diameter, which are stored in the lower edge of the hand.

Basic Game Combat

Much of the action in an action-adventure game comes in the form of combat. Though violence is dangerous, and should be avoided when unnecessary, it is often the best or only possible option in the war against the alien invaders. The following topics are explained herein:

- Time
 - Combat Turns
 - Command & Action phases
- Order of Events in a CT
- Number of Actions in a CT
 - Attacks
 - Other Actions
 - Movement
- Power Usage
- Attacking
 - Command phase
 - Action phase
 - Power cost
 - Attack roll
 - Damage
 - Hitting other targets
- Effects of Skills
- Terrain Modifiers

Time

Whenever a battle occurs, time is measured in Combat Turns (CT). Each represents 8.6 seconds of game time — exactly 1/10,000 of a day. Combat Turns are used when fighting is about to occur, when it actually occurs, and whenever a chase takes place.

Each Combat Turn is handled in three steps. The first, called the Command Phase, is for choosing intended actions (plus a bit of bookkeeping). This does not take any time for characters in the game.

The next two steps are called Cycles, each of which is divided into five phases. Each phase is 0.86 seconds long. It is in these phases that the real action takes place — movement, attacks and damage, and so forth. The CT is broken down into these smaller parts because of the speed at which action takes place in combat. Phases are used to depict the actions accurately, in the order in which they would logically occur. Essentially, fast attacks (such as lasers) go first; slow attacks (such as punches) go last. For details on exactly what happens when, refer to the table entitled "Order of Events" (at right).

Command Phase

Movement is always assumed to be possible during the combat turn, and need not be announced unless it is in some special form, such as ultraspeed. All other intended actions for both cycles of the CT must be announced in the Command phase. Actions announced for the first cycle may not be changed, though they may be skipped, if desired. Actions announced for the second cycle may be changed, but only using the procedure described below.

Action Phases

When the appropriate phase arrives and the Game Master tells you to take your action, you have two options:

1. Perform the action you announced in the Command Phase, or
2. Say no, and merely skip the action (at no power cost).

A character is *never* forced to perform an announced action.

If you take the intended action unchanged, immediately deduct the power cost (if any). If you skip the intended action, no power need be expended for it.

If you choose option 2 (skip the action) in the first cycle, another option is available: you may revise your intentions for the second cycle. If desired, you may even announce an entirely new set of actions, subject to the normal limits of number of actions allowed, etc. These changes apply to second cycle only; actions in the first cycle may not be changed once announced. This is the only way that announced actions may actually be changed, rather than merely skipped.

Specific Phases

The phase in which an action occurs depends upon the relative speed of that action. Appropriate phases for various attack forms and other actions are as given below.

Phase 1 or 6

Zap Weapons: This category includes all attack forms that function at or near the speed of light, including lasers, micro-waves, magnetic effects, and so forth.

Phase 2 or 7

Fast Projectiles: This includes everything that is hurled quickly by a device, but at a speed far less than light, though the speed may exceed that of sound. The category includes all bows and standard guns. (A laser is not a gun, since it does not hurl projectiles.)

Phase 3 or 8

Slow Projectiles: This category covers all objects hurled directly at a target without the aid of a firing device. Such projectiles usually do direct impact damage; for example, rock-throwing would occur in this phase. Objects thrown into the general vicinity of a target, such as grenades, are not included in this category.

Phase 4 or 9

Lobbed Objects & Projected Substances: All grenade attacks occur during this phase, as well as firing of all devices that emit flame, cold, or acid.

Phase 5 or 10

Physical & Sonic attacks, plus all Misc.: Hand-to-hand combat is resolved at this time, as are all miscellaneous actions, such as picking up or grabbing objects. Sonic attacks actually strike their targets during phase 2, but emission must be maintained through this phase to have any effect.

Order of Events in Combat

Command Phase:

- Deduct 1 PU for general operations this Combat Turn
- Declare actions for the entire Combat Turn (both cycles)

Cycle 1:

- Phase 1. Zap weapons (light, microwave, magnetic)
- Phase 2. Fast projectiles
- Phase 3. Slow projectiles
- Phase 4. Lobbed items and projected substances
- Phase 5. Physical blows, sonic weapons, & Miscellaneous actions

Cycle 2:

- Phase 6. Zap weapons
- Phase 7. Fast projectiles
- Phase 8. Slow projectiles
- Phase 9. Lobbed items and projected substances
- Phase 10. Physical blows, sonic weapons, & Miscellaneous actions

Number of Actions

In any one cycle, the maximum number of actions that a CC may take is determined by the character's Neural score, which should already be calculated and written on the character sheet. This maximum is of course subject to further limitation based on the number and type of weapons and other devices available. Movement is never counted against the number of actions allowed; it is always an option.

Attacks

A character may make only one attack per phase, regardless of the theoretical maximum number of actions allowed. For example, suppose a CC has a Neural score of 21, and is thus entitled to two actions per cycle. However, the character only wants to use a laser. The CC may thus make only one attack in each cycle, and that will occur in phases 1 & 6 because of the weapon type. The CC cannot fire the laser twice in either phase, nor use the weapon twice in either cycle. The player is free to select one other attack or action to be performed in the first cycle, but must announce it during the Command phase.

Aliens may be allowed multiple attacks in a given phase, depending on their armament and skill. Characters and normal humans with special skills may thereby be allowed multiple (bonus) attacks with a single weapon; if so, that bonus overrules this limitation, and all such attacks occur in the same phase.

Other Actions

Miscellaneous actions (such as setting traps or mines, picking up objects, etc.) are treated as attacks for timing purposes. All such actions occur at the end of a cycle, i.e. during phases 5 and/or 10.

Movement

In combat, movement rates and their modifiers are measured in Scale-0 hexes per Combat Turn. A character's movement allowance in combat is thus ten times the character's rate of speed (as written on the character sheet). The same conversion also applies to the speeds given for other creatures.

The movement allowance is reduced by one or more hexes per attack made, depending on the types of attacks. The exact movement penalty is specified in the description of each attack form. A movement penalty may also apply for terrain; refer to the Terrain Modifiers table (page 28) for details.

Extra movement allowance may be purchased with power expenditure. The

cost is simply 1 PU per hex (Scale-0) of extra movement. However, the maximum total movement in a combat turn is double the normal movement allowance.

A CC may leap to a maximum height, in meters/yards, equal to 1/10 the Physical Stat. The power cost is 1 PU per meter/yard. If desired, the character may move any amount horizontally equal to or less than that height in the same leap, at no additional power cost. Additional horizontal leaping movement costs 1 PU per meter/yard, to a maximum distance of 1/5 the Physical Stat. The movement allowance used in any case is equal to the distance traversed, whether horizontal or vertical.

Movement may occur in the same cycle as attacks, but not in the same phase. It may occur during any or all phases in which the CC is not attacking, at a maximum rate of 2 Scale-0 hexes per phase, until the movement allowance is used up. Movement is never announced during the Command phase of the CT, and is always an option. It is not counted against the number of actions allowed in the Combat Turn. A character can move as much or as little as desired, up to the maximum allowed.

If a player chooses to skip an announced action, the movement penalty (if any) for that action does not apply. The character may move during that phase, as long as movement is still allowed (which is usually the case, due to regained movement allowance as a result of skipping the action).

Example: A CC with a movement allowance of 10 intends to fire one laser shot and hurl a grenade during each cycle. Each laser shot has a -1 movement penalty, and each grenade, a -2. Therefore, the CC can move up to four hexes during the CT. The character is busy attacking during phases 1, 4, 6, or 9 and may not move at those times, but he or she may move up to two hexes during any and all other phases until the maximum movement of 4 hexes is reached.

Defense Values

Whenever an attack of any sort occurs, the attacker rolls dice and compares the result to the Defense Value (DV) of the target.

Each character or creature has five Defense Values, one for each of the five basic attack forms. These also correspond to the five phases of a combat cycle. All DVs are given in the character or creature descriptions. The DVs of objects are usually left to the Game Master's selection. To resolve an attack, simply match the attack roll to the appropriate DV.

The five DVs are for Light (or Laser), Impact, Thermal, Electro-magnetic, and Sound (or Sonic) attacks. These categories

can best be remembered by their initials — LITES.

Light (Laser) attacks are those that use coherent light to burn through material. They usually have long ranges. The usual defense is reflection of the light.

Impact attacks include every form of collision from simple punches and kicks to high-speed bullets. The ranges thus vary from zero (a punch) to very long (sniper rifle). The best defense against collisions involves the technique of spreading the shock of impact sideways, rather than into the target.

Thermal attacks are those based on extremes of heat or cold, such as flame throwers, liquid nitrogen sprayers, and so forth. The ranges involved are usually moderate, from 5 to 50 meters/yards. Defenses against such attacks usually involve a heating/cooling system in the clothing or body of the defender.

Electro-magnetic effects include various forms of radiation, such as gamma rays, X-rays, and microwaves. The ranges of such weapons are usually short, except when large projectors or nuclear weapons are used. This category does *not* apply in the case of purely magnetic effects, which cannot be blocked except by interposing some iron-based material.

Sound (Sonic) attacks are those that use intense, concentrated sound to vibrate the target, causing structural damage thereby. The range is always fairly short, since the sound loses intensity quickly. Such attacks cannot work in space, being dependent on a medium to carry the sound waves, such as air, water, or even earth. The only known defense against this in combat situations is the creation of more sound to negate the attack.

Power Usage

In combat, each player must keep a careful record of two details about the character: Integrity Points (IP, as explained on page 13), and current battery power reserves, which are measured in PU (Power Units).

In combat conditions, a character expends 1 PU per CT automatically and continuously, whether or not any actual attacks are made. This expenditure is in addition to any other made for the day, Travel Turn, or Standard Turn. This base power cost accounts for the heightened operation of many of the CC's built-in monitors, sensors, and other devices in circumstances that require the use of Combat Turns for timekeeping.

If a character withdraws successfully from an ongoing combat, he or she need not continue to expend power at the combat rate. The battle is over for that

character, whether or not it actually continues for others.

A CC can also expend power to make certain attacks, such as firing lasers, sonics, and others. The amounts of power used for each weapon are summarized in the Weapons section (Adventures book). Some attack forms, such as punches and kicks, do not involve power expenditure.

Extra batteries are sometimes available to CC characters, usually built for some weapon or other device that uses power. The PU totals for these supplemental batteries must be accounted for separately from the character's personal PU total. Unless special arrangements are made, a supplemental power source is only used by the device to which it is attached. Most devices of this type can also be operated from the character's internal power source if plugged into power ports. Likewise, power from a supplemental battery can usually be transferred to the character's internal batteries.

How to Attack

Command Phase

Before your character can attack, you must select a weapon. In the Command Phase, you must announce the exact weapon(s) to be used during the CT. You need not declare your target at that time, and if you choose to modify the attack in some way, that also can wait until the attack occurs.

Action Phase

When the appropriate phase of the cycle arrives, you may attack with the weapon you announced. At that time, you must announce your intended target. (You may also decide to simply skip the attack, as explained under "Action Phases" page 25.)

A modifier (penalty or bonus) may apply to your attack, depending on the situation revealed when you announce your target. If you want to shoot at a small enemy tentacle at long range, for example, a penalty of 50 might apply to the shot. Your Game Master will decide on the proper modifications.

A bonus may also apply because of skills. If a skill check is required, it is made immediately before the attack is rolled, and it does not count as time used, nor as an action. Any applicable skill bonus must be applied at the same time as all situation modifiers.

When a creature is stunned, unconscious, or otherwise defenseless, a bonus of +20 applies to all attack rolls against that creature. This bonus does not apply to any object or creature that is normally motionless.

Power Cost

To perform the actual attack, first deduct the Power Units required for the attack form (if any). Be sure to deduct them from the appropriate power supply; this will normally be the character's primary power system, but if a supplemental battery is used, be sure that you deduct the cost from that source instead.

Attack Roll

Now roll d10x. If the result is 10 or less, you miss cleanly, not hitting anything. Otherwise, leave the dice as they are (that same result will be needed again in just a minute), add or subtract any modifiers that apply, and announce the total aloud. If that total equals or exceeds the Defense Value (DV) of the target, you have successfully hit it. If not, you may have hit something other than the target.

In most cases, you will not know the exact DV of the target; your Game Master will find and announce the success of your attack.

Damage

You should already know the damage that your chosen weapon inflicts; it is either fixed or standard. If the damage is fixed, an amount is given in the weapon description. If it is standard, the d10x roll you just made gives the damage. Note that the roll itself applies, not including any modifications. (That's why you left the dice lying as they were rolled.)

Announce the damage aloud. Your Game Master will deduct that number of points from the target's IP total. If the target is destroyed or otherwise made non-functional as a result of your attack, the Game Master will announce that immediately.

Hitting Other Targets

If you hit something other than the target, some object in the same area as the intended target usually takes the damage. Your Game Master will apply the damage in the normal way if it is important, but will often ignore it, especially in outdoor settings. Important "other targets" can include equipment carried or worn by the target creature, objects in front of the target, and objects or structures beside or behind the target.

Possession of Objects

A character may try to pick up an object in phase 5 or 10. Ordinarily, no attack roll is needed. The GM may demand that a character make a successful attack roll to grasp an object while moving quickly, or to grasp an object that is barely within reach,

though bonuses to the roll normally apply in such situations. The DV of the object may be arbitrarily set by the GM if none is given, but is often no more than 10 (unless modified by slipperiness, small size, etc.).

When the object desired is held by another creature, however, the situation is a bit different. If the other creature is cooperating in passing the object, both may make an attack roll, and the "pass" is successful if either one hits. If the other creature is not cooperative, a successful hit means only that both have a grip on the object. Attempts to pull the object away may immediately be made, and may be repeated at the end of each cycle thereafter (in phases 5 or 10).

To resolve such a dispute, the GM finds the Physical scores of those involved, and subtracts the lesser from the greater. If the result is less than 10, it is rounded up to 10; if 91 or more, round down to 90.

This result is the percentage chance that the stronger creature will immediately pull the object from the other's grasp. If that attempt fails, the weaker creature may also try, but with a percentage chance equal to *half* the difference in the scores (rounded up if necessary). If that attempt also fails, the situation must wait until one of the two creatures lets go, or until the end of the next cycle, at which time the above procedure is repeated.

The object may be adversely affected by this procedure, but such is left to the GM's discretion. In the advanced game, the grasp of a creature with a very high Physical score may be better overcome by attacking the limb holding the object, applying the "called shots" option in the Hit Location system.

Note also that certain skills may be employed to affect the situation. For example, the stronger creature may be talked into giving the object away, or may be psychogenically convinced to do so.

Effects of Skills

Skills may affect movement and combat in various ways. The following summarizes the possible effects, listed in order of skill number. Each applicable skill description contains the relevant details.

110. Personal movement: A successful skill check may allow the CC to reduce or ignore the movement penalty that would normally apply because of terrain. The successful use of special movement abilities, such as acrobatics, may cause a fast change in the CC's position, which may result in a DV bonus for the character.

120. Mounted movement: Whenever a mount is used during a Combat Turn, characters riding on the mount are limited to the movement rate of that creature.

130. Vehicular movement: Characters driving or riding in or on a vehicle during a Combat Turn move at the rate of that

vehicle. A successful skill check by the driver may permit special movement effects, such as extremely fast turns, which may result in bonuses to the DVs of all those in or on the vehicle.

210. Strategy & Tactics: A successful skill check may result in surprise, adding a bonus to the attack roll or to damage alone. Likewise, a successful check may result in a gain of initiative — that is, when the enemy and the CC are both attacking in the same phase, the CC's attack is resolved first.

220. Unarmed Combat: See the skill description (page 18) for details on this complex topic.

230. Personal Weapons: These skills have obvious combat applications.

300. Psychogenics: Psychogenic skills may be used to affect combat in various ways. Matter and Energy may be affected so as to reduce the attack roll or damage of an enemy attack, depending on the attack form. Beings may sometimes be affected, and the possible results therefrom are myriad, including changes of action, penalties to attacks or damage, and so forth. For all psychogenic effects, the exact result varies by the psychogenic potential of the individual (measured in psychons), and by the result of a skill check.

Other Skills: Static skills (numbers 400 and up) may affect combat indirectly. Skills in Arts & Language (400) can produce changes in the actions or reactions of others. Skills in the Sciences (500) may be used to affect the objects or beings to which each refers. Skills in Law (600) may affect a character's actions. The use of any such skill requires a full Combat Turn at least, and often more.

Example: A CC falls in battle, immobilized by arm and leg damage. A comrade spends an entire CT jury-rigging repairs, and attempts a skill check in the Field of Physical Sciences (560) or the Area of Mechanics (562). (Less than a full CT of work would have no effect.) The check indicates success, and the fallen CC thus regains 1 IP (or 2 IP in the advanced game, allotted to specific body parts) which represents the minor repair. The victim may thereafter crawl behind cover or away from the imminent danger of the battlefield.

Terrain Modifiers

The following penalties apply to the movement allowance of any character or creature trying to move in the terrain type indicated.

Note that the use of an autopilot (at the cost of 1 PU per CT) negates all penalties of -3 or less, and reduces other penalties by 3, except for water current effects. The autopilot does not affect movement bonuses.

Terrain Modifiers	
Terrain	Penalty
Slope down	+1 per 10° slope
Stairs down	+1
Flat (any)	None
Stairs up	-1
Woods, thin	-1
Slope up	-1 per 10° slope
Foliage, thick	-2
Woods, dense	-2
Jungle	-3
Broken	-3
Water	-3
Mud	-1 to -3
Ice	-4
Swamp	-4
Submerged	-5
Climbing (up/down)	10% normal move rate
Water Current	Special

Terrain Notes

Broken: This applies to any area wherein a mistake in footing could result in a fall. The danger could take any of a number of forms, such as holes in the surface, ground strewn with objects large enough to trip over, etc.

Foliage: This assumes few or no hard objects, merely vegetation.

Ice: Apply to movement on either solid ice or ice-covered terrain.

Jungle: Apply to all terrain involving very dense foliage combined with thin woods. If a jungle area has few or no trees, use a -2 penalty; if the foliage is combined with dense woods, use -4.

Mud: This applies to all bogs, mires, and otherwise gooey but passable terrain, including shallow quicksand. The penalty varies by the depth of the goo; it may be increased by the GM for depths of 1 meter/yard or more.

Slope down/up: A slope must be 10° or more, enough to materially affect movement. The modifier applies per 10° of slope, e.g. +4 hexes for descending a 40° slope. Slopes greater than 50° cannot be negotiated by normal movement, and must be climbed.

Stairs down/up: The modifier assumes a typical stairway at a 30-60° angle.

Submerged: Apply this whenever 75% or more of the character's body is underwater. Also see Water Currents (below).

Swamp: This designation assumes a combination of dense foliage, mud, and occasional water.

Water: Apply this modifier to all streams, shallow lakes or bays, etc. in which the water is either still or moving relatively slowly. Use the "Submerged" modifier (above) instead if the character is underwater. Also see Water Currents.

Woods: "Thin" includes typical lightly wooded areas, and any other area with comparable obstructions, such as a building interior with support pillars. "Thick" applies to all areas in which the trees are thick enough to provide cover (about 0.6 meters/yards).

Water Currents

The movement of water can have a severe effect on the movement allowance of creatures and vehicles partially or completely submerged within it. For unpowered creatures, water movement can negate and even overwhelm normal movement. For powered creatures (such as CCs) and vehicles, those effects can usually be negated by additional power expenditure. Throughout this section, a character will be used as an example, though the principles apply to other creatures and vehicles as well.

When the CC's direction of movement is exactly opposed to that of the water, subtract the water's movement rate from the CC's. When the movements are in the same direction, add the two rates.

When the CC's direction of movement is at an angle to that of the water, and if the character wants to avoid drifting with the current, add or subtract half of the water's movement rate. (For simplicity, use this formula for all angles of 45° or more, and ignore it for lesser angles.)

To prevent a loss of movement allowance due to current, any powered creature (such as a CC) may expend 1 PU per point of movement allowance affected.

Examples: A CC who normally moves 10 hexes per CT tries to go upstream against a water flow of 4 hexes per CT. The net movement rate is 6 hexes per CT. Going downstream, the CC can move 14 hexes; at an angle upstream, 8 hexes; and at an angle downstream, 12 hexes per CT.

If you are using water flow rates given in knots, miles per hour, or km per hour, convert them to Scale-0 hexes per Combat Turn for ease of calculation. (A hex is 10 meters/yards across, and a CT is 8.6 seconds.) Round off only when necessary; units of half-hexes (5 meters/yards) are common, and tenth-hexes are quite usable.

Finally, note that a character weighs about 170 kg (375 pounds). Current has little effect on sinking, though it may apply to the ensuing walk across the river or lake bed.

Advanced Game Combat

Once you are familiar with the basic game, it is recommended that you increase the realism of the game, and to some extent its complexity, by using the advanced game combat. This section includes special effects, attack bonuses, hitting other targets, and hit location, as explained below. An optional addition is included for those who wish to find the exact condition of a body part that has suffered extreme damage. This is most often used for CCs, but should be applied to all creature types.

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 - SFX Table
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Special Effects (SFX)

If an attack hits the target, and the unmodified attack roll was doubles — that is, the same number on both dice — a special effect occurs. Either you or the Game Master (GM's choice) will then roll again, using only one d10, and refer to the following table to find the special effect. Normal damage applies in every case, and the special effect may add to it.

Note that SFX apply to all attacks, not just to those of the characters. Many SFX apply to targets of all types, while other more specific SFX are given for each of the three basic target types — humans, CCs, and aliens. The GM is free to invent additional SFX results for targets other than those specified.

Although a roll of doubles occurs 10% of the time, results of 10 or less are clean misses for starting characters and most aliens, leaving 7% of the possible results subject to SFX. Many of those attacks will still miss the targets. SFX are thus uncommon or rare.

Special Damage Effects by Target

d10 roll	Normal human	CC	Alien
1	Flees in fear	Loses 10% of PU	Splits
2	Flees in fear	MadMac NF 1 CT	Loses all power 1 CT
3	Faints 10 CT	MadMac NF 10 CT	Loses all power
4	Blind 1 CT	Inboard weapon NF	see left
5	see right	Weapon destroyed	see left
6	see right	Stunned 1 CT	see left
7	see right	Stunned 5 CT	see left
8	see right	Body part affected	see left
9	see right	Damage bonus +20	see left
10	see right	Damage doubled	see left

Notes

If no duration is specified, the effect is permanent until repaired.

Blind: The human's optic nerves suffer temporary damage.

Body part affected: One of the target's limbs is severely affected by the attack. If the attack form is Laser or Impact, the limb is severed from the body. The limb severed will be the one holding a weapon if such is applicable; otherwise the GM should randomly determine the limb affected. If the attack form is Thermal, Electromagnetic, or Sonic, the body part is permanently paralyzed due to neural or circuit damage, and will remain so until repaired.

Damage bonus +20: Add 20 to the damage indicated for the attack that caused this special effect, then apply the total normally.

Damage doubled: Double the damage indicated for the attack that caused this special effect.

Faints: The human is unconscious and defenseless for 10 CT.

Flees in fear: The human moves away from the attacker as fast as possible, taking advantage of cover if available.

Inboard weapon NF: In the CC or the alien, one built-in weapon (GM's choice) is damaged, and will not function until repaired.

Lose 10% of PU: The CC must immediately deduct 10% of his or her current PU total. This does not affect supplemental power sources.

Lose all power: All of the alien's power

sources are shocked and unusable, either for 1 CT or permanently (as indicated).

MadMac NF: The CC's MadMac is non-functional due to shock. Apply a -20 penalty to all attack rolls due to lack of computer-assisted aiming. Ignore MadMac skills for the duration.

Splits: The alien splits into two parts, each of half the size & IP of the original.

Stunned: The victim cannot move or attack for the duration indicated, but is marginally aware of the situation. For a CC, the MadMac is not affected, and may take limited action, though it will not normally initiate attacks.

Weapon destroyed: Any one weapon (GM's choice) either built into or carried by the CC or the alien is destroyed, and cannot be repaired without extensive work and adequate replacement parts.

Attack Bonuses

In basic game combat, the unmodified d10x roll is compared to the target's DV to determine the success of the attack. The same roll also gives the amount of damage inflicted by the attack. In the advanced game, bonuses may be applied to aiming (affecting the initial roll and thus adding to both the chance to hit and the damage inflicted) or to the damage alone.

Aiming Bonus

Certain special equipment allows you to increase the accuracy of an attack. For

example, a MadMac always helps somewhat in aiming, at no special power cost. If you choose to boost its help by running a Prediction Aiming Digitizer (PAD) program as well, that improves your character's aim, but costs an additional 5 PU. The amount of the PAD or other aiming bonus is always equal to the amount of PU expended for it.

Damage Bonus

You may modify some attacks by expending extra Power Units to intensify them. For example, firing a laser normally costs 5 PU, but you can expend more (in increments of 5) to intensify the shot. If you choose to do this, you must announce it and deduct the PU cost at the same time you deduct the basic PU cost for the attack form (i.e., before you roll the dice). When an attack is intensified, this is generally called "kicking" it. A damage bonus never affects the initial d10x roll. It is added only after a hit is scored.

Example: Hoping for a quick kill, you fire an inboard laser (standard damage, cost 5 PU) at an alien, PAD the shot, and kick it by 20. Your total cost is 30 PU (5 normal +5 PAD +20 kick); deduct the full amount immediately. You will add 5 to your d10x roll (for the PAD), and if the attack hits, add 20 more (for the kick) to determine the final damage.

Other Targets

In the basic game, any attack roll that is neither a hit nor a clean miss merely hits some unimportant object within range. This still applies as a general rule in the advanced game, but the result may be modified by circumstances, at the GM's discretion. Damage resulting from this attack roll should not be ignored when other important targets are in range.

An important target includes any human, CC, alien, structure, or device. The general term "within range" describes an area that varies by the attack form used. For a weapon of very limited range, such as a sonic attack, it obviously includes only those targets in the immediate vicinity. For rifles, lasers, and other weapons with long ranges, it could mean something or someone a considerable distance beyond the intended target, but located in the same direction. See specific weapon descriptions for appropriate ranges.

In any situation of this type, the Game Master should select *one* other important target within range, by any logical or random manner desired, and compare the attack roll to the DV of that target. If the attack hits the newly-designated target, the damage is applied normally.

This procedure may be repeated, especially in the case of long-range attack

forms, if the second target is missed but another remains in range. But eventually, the damage will be applied to some target, important or not.

Example: A character fires a laser at an alien who is battling a CC hand-to-hand. Two normal humans stand nearby. Beyond them, another CC is battling another alien. The player rolls d10x, and the shot misses the intended target. It might then hit one of the normal humans, the other CC, or nothing. The GM rolls 1d10 to find out, and mentally decides (based on the sizes of the potential targets involved) that 1 = the CC, 2-3 = a human, and 4-10 = nothing. The roll comes up 6, so the shot misses everything.

But wait — other targets are in range, in the same direction. The GM sighs and decides to roll again, using the same probabilities but with 2-3 = the second alien. The result of this roll is a 4, so the laser shot merely hits a tree or something else of little or no importance.

Though this example produced no important results, there was a 51% chance that something or someone important would be hit by that "miss" — and such things *will* occasionally happen in your games.

Hit Location (HL)

This is a system of applying damage to specific body parts instead of to an overall target. Basic characters do not have IP allocated to each part; you must use advanced characters if you wish to use the Hit Location system.

If an attack inflicts damage on an opponent, the attacker immediately rolls again to find the part of the target's body to which the damage will be applied. This additional roll will usually be a single d10, though d100 may be needed for complex targets.

Called Shots

Instead of leaving hit location to random selection, the attacker may aim the attack specifically at a certain body part. A penalty of -20 is applied to the attack roll, thus reducing both hit probability and damage.

If the modified attack equals or exceeds the DV of the target, the exact body part named is hit, and damage is applied. Otherwise, the attack misses, even if the unmodified attack roll would have hit.

Any body part other than the torso may be severed with a successful called shot. If the damage inflicted is 50% or more of the target part's IPs, that body part is severed from the torso. (A body part cannot be severed except as a result of either a called shot or a special effect.)

Hit Location Tables

Humans & Humanoids

d10	Location
1	Head
2	Left arm
3	Right arm
4	Left leg (knee & below)
5	Right leg (knee & below)
6	Upper leg (either)
7-10	Body

Xenoborgs (alien troops)

d10	Location
1	Leg (any)
2	Head (if any; otherwise appendage)
3-4	Other appendage (any)
5-10	Body

Location Roll

No random HL roll is made when a Sonic attack is used. The nature of that attack mode allows the attacker to name the hit location. To find exact hit location for any other attack form, roll d10 and refer to the HL Table that applies to the target.

An HL Table can be deduced for any creature whose IP data are given by body part, by examining those data. In some cases, d100 may be needed instead of a simple d10.

Example: A very small Teleborg has 2,000 IPs, of which 1,800 (90%) are body IPs. A simple HL chart would be: 1-9 = body; 10 = any tentacle. If the creature has five tentacles, d100 could be used to determine the exact area hit.

When the Game Master adds creatures to the game, whether terran or alien, an HL table should be created *before* specific body part IPs are allotted.

Example: Suppose an elephant has a Physical score of 300. Its IPs would then be 600 for the basic game, or 900 for the advanced. A reasonable HL table would be: 1 = head; 2-5 = leg (by location); 6-10 = body. The proportionate IPs would then be: Head 90; Legs 90 each; Body 450.

Modifying Results

The Game Master must occasionally modify HL results based on the positions of the opponents. For example, when a target's right side is obscured, and its left side faces the attacker, any HL result of "right leg" or "right arm" should simply be

applied to the corresponding body part on the left (exposed) side.

If the HL roll indicates a body part that has been destroyed by damage previously sustained, the damage is applied to the torso instead.

Partial Targets

When only part of a target is visible (e.g. upper body of a character crouching behind cover), the attack and HL rolls are made normally. However, if the hit location indicated is obscured by cover, the result is ignored — despite the previous roll indicating a hit. The attack instead hits the object providing such cover, and may damage or destroy it.

Body Part Condition

This optional addition to the advanced combat system is offered for those who wish to know the exact condition of a body part that is damaged by attacks. This requires more record-keeping, and should not be used unless the participants become familiar with it and can utilize it fast enough to avoid slowing the game. If used, this option should be applied in its entirety; specifically, the multiple-part damage effect should not be ignored by those who want the benefits of the lesser-damage effects.

The condition of a body part varies by the damage inflicted upon it, as follows: If the damage is 1-2 times the IPs of the body part struck, that part is disabled but not destroyed. It can be repaired, but only if the appropriate replacement parts (and the skills to use them) are available. If the damage is 2-3 times the IPs of the body part struck, that part is totally destroyed. If the damage is more than 3 times the IPs of the body part struck, excess damage is applied to the next closest body part. Deduct that value (3 times the IPs of the body part) from the attack value and continue applying the remaining damage.

Keep track of the damage taken by a body part until it is completely destroyed.

If two or more body parts are adjacent to the HL target (which may be the case for certain aliens), divide the damage as equally as possible. Note that only immediately adjacent body parts can take damage in this way.

Example: A CC's arm has 15 IP and takes 28 points of damage. It is disabled but not destroyed. However, it is hit again shortly thereafter, for 35 points. It absorbs 17 IP of damage (45 for complete destruction minus the 28 it already took) and is destroyed. The remaining 18 IP from the second hit are applied to the character's body.



Official Report to the Trans-American Regional Government
(Excerpts)

Project CCG1: Technical Data

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2.0 Introduction

This document contains all the pertinent technical data currently available on the CC unit, including development and history. Additional material has been classified for reasons of national security.

2.1 Exposition

A CYBORG COMMANDO (CC) is a device which blends three separate parts — a human brain (and ancillary organs), a computer, and a mechanical body — into one functional entity. Originally designed to be the ideal military soldiers, CCs have proved to be quite versatile and usable in a multitude of circumstances.

2.2 Design Evolution

The military's ideal special operative — an officer-spy, if you will — has been an unrealized goal for many years. Any individual selected for such a position must possess all the requisite traits, such as extremely high amounts of guile, a sense of duty, and an instinct for self-preservation. Wisdom in some measure is another requisite, though an excess of sheer intelligence tends to result in disqualification. Every normal man selected for such a task has lacked the proper measure of at least one of those qualities.

So when the routes to the goal of such a specialist were reconsidered in light of the technological breakthroughs of the Century Revolution, the generals and their scientists discussed three options: the all-mechanical device, the human-driven vehicle, and the merging of operator and machine (cyborg).

Initial experiments with an all-robotic unit that could be controlled by either inboard or external means showed the following results. External control is easily disrupted, especially in combat conditions. Although an inboard computer can

operate most of the mechanical body, and can obey very sophisticated instructions, it is utterly amoral and may make errors. It can be programmed to handle almost anything, but its reactions to the unexpected are correspondingly unpredictable. Though usable, this is not the optimum solution.

Human brains are thus needed at the controls of a mechanical device. Vehicles of several forms (including humanoid) have been constructed, each containing room for one or more human operators. These are clumsy and limited both by their designs and by the skill of the controllers. Large units require vast amounts of power because of their great weight, and are highly conspicuous.

The cyborg format, in which a human operator is merged with mechanical elements, became the focus of study. Initial plans for the mechanical parts were nothing more than elaborate mechanized armor. But discoveries in the field of medicine — specifically in brain transplantation and, as a corollary, the workings of the spinal nerves — led to the first merging of human brain and mechanical body.

This unit was dubbed the CYBORG COMMANDO operative because of the military hand guiding its development. The following is a technical description of its construction and abilities.

3.0 The Brains

Each CC unit has two brains, one organic and one electronic. The former is taken surgically from the living human volunteer. The latter, called a "MadMac," is installed within the brains capsule.

3.1 The Organic Brain

The organic part of a CC is its most complex element, as well as its most important. Unlike a computer, the human mind is versatile, essentially trustworthy, and can be trained to extrapolate efficiently even when given insufficient data.

A capsule within the CC contains one human brain, several supplementary glands to provide necessary hormones, life support mechanisms, and a computer. Through a complex interface called the Sawtell SINC (q.v.), the life force and intelligence housed within the brain can interact with those elements, and through

them, with the outside world.

The interface (SINC) can only handle impulses from three sources — the brain, the computer, and the body. Though limited, it is the best (and only) device of its kind. Surgical research has focused on the brain's neural output, and more study of the information flow along the spinal nerves is required before full brain-to-mechanical body interaction is possible.

The same technological limits that dictated the use of an isolated brain also made the CC more versatile. Its minimum size is that of a normal man, though units are typically constructed with 1-2 feet more height and proportionately greater dimensions for various technical reasons. The life support devices for a human brain are relatively small and simple compared to those needed for an entire body. Were an actual person to be contained within a mechanical body, oxygen use would be five times, and other sustenance at least ten times, the amounts required by the current design. The life support mechanisms are thus quite compact.

3.11 Containment

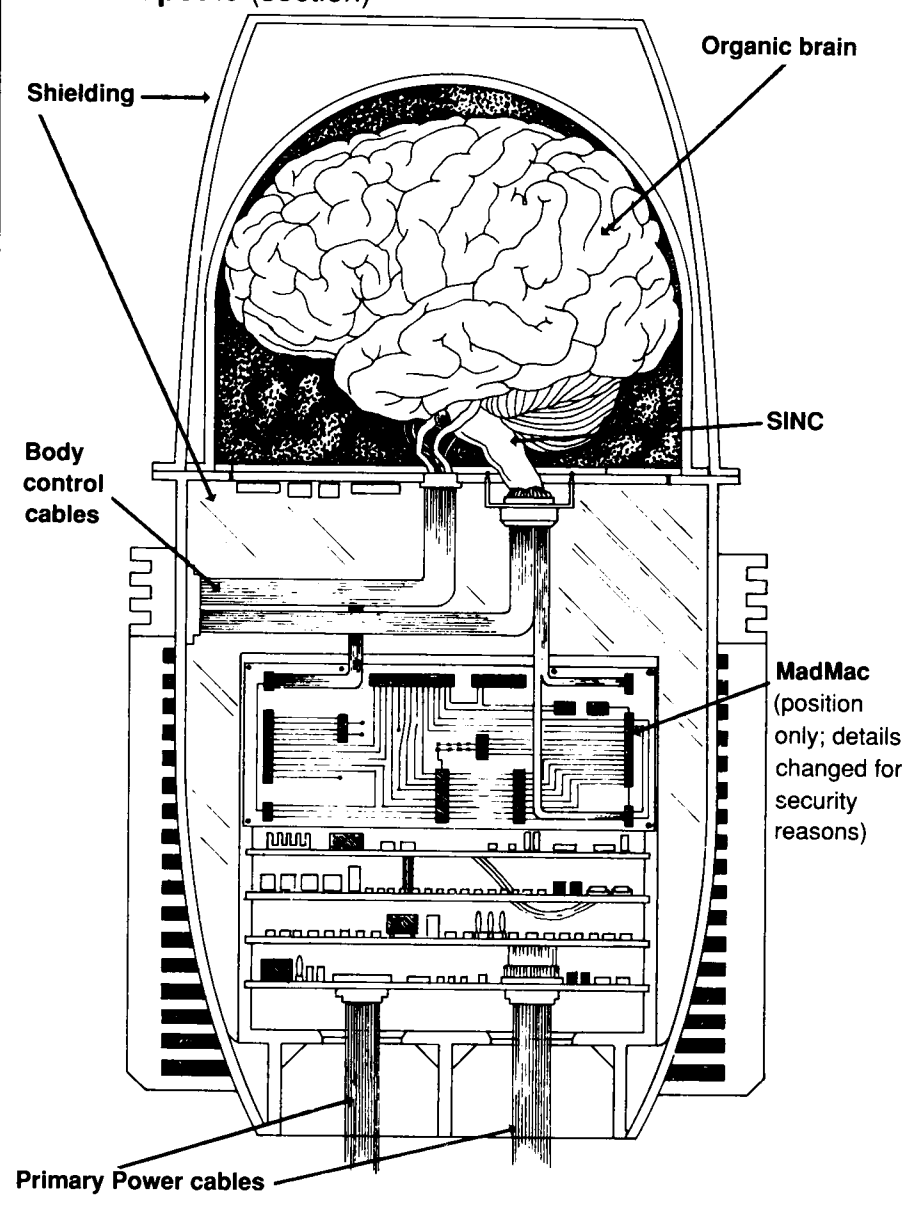
When the organic brain is "loaded" into a completed CC body, it is within a sealed barrel-like capsule about 29" long and 14" wide at the center, tapering somewhat at the ends. This is installed vertically in the CC torso and connected to the CC circuitry. It contains life support mechanisms (for the brain and ancillary organic parts, as described below), a separate power source for such systems, and the "second brain" of the CC — the computer. When installed, this capsule nests into another container which houses the primary CC power supply (q.v.), located in the lower abdomen. The computer normally uses this power, and does not rely on the organic brain's (secondary) power supply.

3.12 Transplant Procedures

The brain itself is surgically removed and placed within a plastic shell, which is then inserted into the capsule. Part of the shell is nearly a duplicate of the cranium, custom-built for each individual; the remainder is shaped to accommodate those glands that will accompany the brain (see right). The shell is lined with a colloidal substance that needs no sustenance, but which performs all the functions (protection, sustenance, etc.) of the fibrous dura mater, the arachnoid membrane, the pia mater, and the cerebrospinal fluid. Those membranes and fluids are removed during the surgical procedure.

The operation itself takes over 40 hours, and is performed by several medical teams with extensive computer assistance. It can be performed under military supervision at any hospital with the necessary life support equipment. First, the body and brain are placed on separate life

Brains Capsule (section)



support systems. One surgical team then severs the spinal cord just below the medulla oblongata, connecting the individual nerves to the interface (SINC); a second team maintains the life support of the body and opens the cranium for the transplant procedure. During the installation of the SINC, nerves connected to other parts of the head (such as the optic and otic) are rerouted to the SINC.

When these procedures are complete, certain other glands, including the adrenal glands, the islets of Langerhans, and the thyroid and parathyroids, are moved, one by one, to the brain's life support system. These are necessary to provide requisite hormones. The pituitary gland, pineal body, thalamus, and hypothalamus are all left in situ within the brain, and of course are transplanted with it. Direct organic

neural connections are reestablished with the appropriate parts of the brain, and the glands are connected to the new circulatory system.

At this point, all organic materials to be transplanted have been disconnected from the body. The latter is removed and further to maintain its stability under long-term artificial life support (see 3.14, page 34). The organic elements for transplant are placed in their proper positions within the plastic shell, still connected to the life support mechanisms of the operating room. The shell is then placed within the larger capsule. Other more compact life support systems (already within the capsule) are connected to the shell, and the surgical systems are disconnected. Finally, the CC body controls and computer (also within the capsule) are connected to

the SINC, and the procedure is complete.

3.13 Care of Organic CC Elements

The capsule's self-contained life support system has its own nutrient tanks for both food and oxygen. The food supply is a sealed system, but the CC obtains oxygen from external air during normal operations. The internal nutrient tanks contain enough food for about three years of operation, and oxygen for one year.

For the circulatory system of the organic elements, a standard synthetic blood (Neoplasma®) is used, being the most convenient medium for support and control, and readily available from almost all hospitals. All nutrients, for example, are mixed directly with it. Wastes produced by the few organic elements are filtered from the synthetic blood by a tangent system, which conveys the wastes to the head. They are then disseminated in a fine spray and expelled by simple air movements.

A wide assortment of chemicals may also be added to the blood, as the situation demands. Such substances are normally added only after mutual agreement of the organic brain and the computer; but if contact between them is not possible (such as sometimes occurs with neural damage or unconsciousness), the computer decides. The items most often used, and thus kept in the largest supply, are vitamins, nutrient supplements, hormones not supplied by glands, and a motive stabilizer (paradopamine, which increases the degree of the brain's control over the CC body). Other components of the internal pharmacy include an assortment of the following:

- Antibiotics, to kill infectious bacteria.
- Anti-viral drugs, to kill or paralyze infectious viruses.
- Analgesics (opioids and others), to stop all pains. This category includes nonopioids such as salicylic acid and ibuprofen.
- Cardiovascular and anticoagulant drugs (digitalis, beta-blockers, and others), to ensure smooth blood flow by preventing thrombosis (arterial clogging) and reducing hypertension.
- Antispasmodics, to lessen shock, and negate the effects of drugs & gases that induce spasms.
- Psychoactive drugs (4 types):
 - Tricyclic and MAO (monoamine oxidase)-inhibiting antidepressants, to improve overall attitude by removing depression and fatalism, but without inducing elation or foolhardiness.
 - Neuroleptic and benzodiazepine tranquilizers, to reduce fear and

severe anxiety, calm violent or aggressive behavior, etc.

Chlorpromazine (a fast antipsychotic), to stop hallucinations et al.

Methylphenidate & pemoline, to aid concentration.

3.14 Care of the Organic Body

Though the procedures for returning the brain (et al.) to the body are not yet perfected, research and progress in this area are continuous. The body is thus carefully treated after the surgery. Among the many procedures involved in caring for it is the addition of a chemical which changes the crystallization properties of the cells. This is added to the blood, and allowed to circulate for about 30 hours. The body's temperature and metabolic rate are then reduced slowly to and past the point where the cells freeze. If any problems occur, the procedure is reversed and adjustments made before re-freezing. If the body stabilizes at about -25° C (-13° F), it is monitored for another day or two to ensure its safety, then placed in a liquid helium bath and thereby dropped to -270° C (-454° F) for long-term storage. The body may be preserved in this way almost indefinitely.

3.15 Organic Elements of New CCs

The focus of current CC R&D is on improving surgical techniques and expanding the possibilities of connecting the neural and mechanical elements. Encouraging progress has been made in developing a mechanical surgeon for the former, which would perform the work as ordered by a human doctor. This is still in its early stages, however. More detailed physiological examinations of the human body, especially of the exact neural paths connecting the body and the brain, should lead to the development of a revised interface allowing full interaction between both bodies and both brains (organic and mechanical, in each case). Prototypes of the mechanical parts are already being constructed.

The perceived ideal form of a CC, in which an intact and whole operator may ride within and mentally control a large mechanical body, is thus still in the future. New developments in microsurgical speed and further study of the neural pathways involved may eventually aid researchers in reaching this goal. The revised form will be called the CYBORG CHAMPION™ unit.

3.2 The Sawtell SINC

The Sub-cranial Interface & Neural Converter (SINC) was created in 2022 by

Dr. Richard Sawtell, working at a U.S. Army research center in Virginia. Specific details of the SINC are classified, but can be obtained from any of several governments. Simply, it converts nerve impulses from organic to electronic forms, and vice versa, with assistance from the computer (q.v.). The SINC is thus a key element in CC operations, allowing voluntary functions to be controlled directly by the organic brain and nerve impulses.

3.21 Operation

The device works with nerve impulses of three basic types: receptors, motivators, and autonomies. Receptors (senses) include exteroceptors (ranged senses, such as sight), interoceptors (body contact, i.e. touch), and proprioceptors (monitoring organic body elements). Motivators handle the movements of the body, in cooperation with "feedback" from various receptors. Autonomic impulses handle various unconscious operations, such as organic life support mechanisms. The SINC handles all contacts between the organic brain and the rest of the CC, usually working through the computer but sometimes contacting the mechanical body directly.

3.22 Implantation

The implantation procedure currently requires the truncation of spinal nerves just below the cranium. In the future, it may merely involve substituting a mechanical element for a short segment of each nerve fiber. In any event, however, the procedure is presently irreversible. Each nerve of the upper spinal cord must be processed individually for connection to the SINC.

3.3 M A/D M-A C

The MadMac is a revolutionary type of computer that works with the organic brain, assisting it with the task of running the CC body.

3.31 History

The computer used in CCs was developed in 2008-2013 by the research labs of a well-known telecommunications company. A software (programming) breakthrough occurred in the late 1980s when a mathematician from Akron, Ohio developed a generalized program that a computer could use to solve nearly any problem, by selecting and using smaller parts of that program. This large program is called the Chandrasekhar* Macro-Algorithm. Though simple to describe in this way, the macro-algorithm itself is extremely complex. The computer must

function in much the same way as a human brain, quickly deciding which parts of the macro-algorithm to use in solving a given problem. This has been the greatest step toward true artificial intelligence since the invention of the electronic computer.

Refinement of the macro-algorithm continued through the turn of the century. During the same period, new developments in electrical superconductivity (a phenomenon earlier thought limited to cryogenics) produced the first "warm superconductors," synthetic metals with near-zero resistance at temperatures as high as 0° F (-18° C). When such materials were first used in computers, the full potential of the macro-algorithm was finally realized.

The continuing evolution of miniaturization also paralleled these developments. Microcircuits made of room-temperature superconductors were soon built, using waldos (robotic devices that convert an operator's hand movements to micro-scale) to assemble the components. In many cases, an electron microscope was needed to observe the results.

3.32 Specific Notes

The pinnacle of development came with the Miniaturized Analog/Digital Macro-Algorithmic Computer (M A/D M-A C, or "MadMac"), which in turn led to the Sawtell SINC. The basic element of MadMac is a switch called a cryotron, which was developed for cryogenic uses in the mid-20th century. It functions in less than 10⁻⁸ second.

The primary functions of MadMac are twofold: operating the automatic functions of the CC body, and providing additional memory (usually called pseudomemory) for the operator. The former tasks are fairly routine, and all involve the use of simple electrical circuitry throughout the body. The SINC comes into play for all memory functions, as well as the program output functions, i.e., information relayed to the operator from the automatic programs.

Pseudomemory is available with the same speed and facility as the original memory stored in the organic brain. The operator literally cannot tell the difference between the two types, except in the rare case of a partial malfunction of the MadMac. The use of pseudomemory does not interfere with automatic or voluntary body functions also controlled by MadMac, partially due to the speed involved, and partially because the latter functions are handled by the macro-algorithm. The data used by these sub-programs are rarely or never accessed by the organic operator.

If the human brain were able to absorb pseudomemory, extensive training and education could proceed simultaneously with field operations. But it cannot, and the reason is simple. Since the human brain cannot distinguish between the "real" memory and the pseudomemory, the operator has no way of recalling a pseudomemory and "memorizing" it in a new location. Attempts to do so merely reinforce the memory in its existing location, either organic or electronic.

In the rare cases of malfunction of or damage to the MadMac, the pseudomemory might become temporarily inaccessible. In such cases the data stored in the organic brain must suffice until the damage is repaired.

4.0 Power Supplies

All functions of the CC body use electrical power. This power is stored in chemical batteries within the CC's form.

4.1 Primary Power

The primary batteries are housed in a segregated capsule positioned below that of the organic and electronic brains. The power capsule is ring-like, mounted horizontally to the portions of the frame corresponding to the human pelvis. Each battery is modular, and is relatively easy to access and replace. For safety reasons, this is normally done whenever a CC returns to a supply base, as part of a routine maintenance procedure. The batteries carry a charge sufficient to continue normal operations at a low level of power use (i.e. no combat and minimal movement) for several years. In practice, however, they must be recharged much more frequently, since a CC is often very active. Power scavenging during field operation is common. (See Recharging, 4.4, pg. 36.)

This electrical power is in the form of direct current. While DC is impractical for high-voltage and/or long-range operations, it is quite efficient in a CC, and especially so since superconductive materials are used for all connections. The power losses characteristic of community electrical services, which require the use of alternating current, are not a factor in the CC design.

The primary storage cells are of the sodium-sulfur type, a standard high-energy-density battery perfected in the 1990s for vehicle propulsion. The positive electrode is sodium polysulfide, and the negative is molten sodium. The solid electrolyte is beta-alumina. These units are

quite warm, operating at about 570° F (300° C), and are thus mounted within well-insulated containers. They are rechargeable, of course.

All powered functions of the CC, including the operations of MadMac and the organic life-support systems, are normally supplied by the primary power circuit.

4.2 Secondary Power

The "brains capsule" contains its own power reserve in storage batteries smaller than but otherwise identical to those in the primary unit. The capsule is positioned above the organic elements, in the upper torso just below the neck, and is separated from them by a protective shield. MadMac monitors, and can feed power to, this subsystem, but the power leads are input-only. Secondary power cannot be used for movement, weapons, or any other system external to the brains capsule.

The purpose of this reserve is to power the life support systems necessary for survival of the organic parts, and only when such power is not available from the primary system. Its secondary purpose is to power MadMac if the separate micro-battery therein malfunctions. In the event that the primary power system reaches zero units (total lack of power), all elements of the brains capsule automatically switch to self-contained battery power, i.e. organic elements on secondary, MadMac on its tertiary source. Subsequent restoration of power in the primary batteries is monitored by MadMac, which can reconnect the brains capsule to that system, but will not normally do so until the level of primary power passes a given safety threshold (10% of maximum power).

When the brains capsule switches to internal power, chemicals are added to the blood supply, causing controlled unconsciousness and a drop in metabolism. The operator's mind is primarily in heavy sleep. Intermittent periods of light sleep (dream states) are periodically induced for reasons of mental health. The secondary power source can maintain organic life support systems in this mode for about 180 days, assuming that sufficient nutrients remain. If the secondary power unit reaches the zero level, the organic elements expire within 30 minutes.

The capsule battery is checked but not normally replaced in routine maintenance procedures.

4.3 Tertiary Power

One microbattery is imbedded in the MadMac circuits. It is of very low power

* Ombramanyan Chandrasekhar, 1945-2231, son of the brilliant Indian-born physicist Subrahmanyan Chandrasekhar (1922-1997), who postulated the quanta governing behavior of dying stars.

and usable only by MadMac; it would be exhausted in minutes if required to operate the organic life support system, for example. The tertiary battery engages automatically when the primary power system reaches zero units. If it fails to provide power for any reason, current is automatically leeched from the secondary system, decreasing the organic survival time by about 0.16 % (roughly 7 hours' worth used in the 180-day period).

The tertiary battery supplies only enough current to maintain MadMac's technical (but not fully operational) existence, but can do so for about 50,000 hours (5.7 years). One of MadMac's few functions while on such "trickle power" is to watch for an increase in primary power, such as from a recharge provided by a rescue team. If such an increase is detected, MadMac will automatically leech some of the current provided to recharge the secondary and tertiary power systems. However, if such a recharge is provided after the organic elements have expired (i.e., after more than 180 days on secondary power), current is not routed to the secondary system. If MadMac's memory is relatively intact at that time, it can provide full details on the circumstances leading to that expiration.

MadMac's memory retains its integrity while on "trickle power," though it cannot be accessed without using primary or external power. After the cessation of all power, memory begins to degenerate slowly, reaching negligible levels after another 7-8 years. Memory losses occur evenly in all banks, including sentience programs, which can lead to significant and unpredictable behavioral changes in MadMac within a year after power cessation. *Any unit in this condition can be extremely dangerous.* Before contacting such a unit, it is *imperative* that it be disconnected from its body control circuits.

Recharging

In the field, power can be recharged with nearly any electrical source, such as car batteries, electrical power plants, solar power receivers, and even fallen enemy alien 'borgs. A rectifier engages automatically when the power source tapped involves alternating current. Power in other forms (such as magnetic, mechanical, or gravitic) cannot normally be converted into electricity without extensive hardware. Whatever the source, the maximum recharging rate for the Primary power batteries is 7 PU per minute (i.e., 1 PU per Combat Turn).

A CC with zero primary power appears as an inert hulk, whether or not internal systems are still operating. Another CC or a technician with appropriate equipment may analyze the unit's status by connect-

ing to the proper circuits through monitoring ports. Even with the proper connections, however, the monitoring will obtain only "zero power" readings unless the proper access code is input and recognized by the fallen unit's MadMac. This is a safety device to guard the little power remaining, if any. Access codes are standard and known to all MadMacs and most skilled CC technicians.

Power can be fed into a fallen CC through any of various ports, regardless of prior attempts to ascertain its status. These ports are located in the hands, feet, and neck. Incoming power is automatically channeled, through the rectifier if conversion to DC is needed, into the primary batteries. The fallen unit's MadMac will leech power to its microbattery and/or the secondary power source as needed. It will also use incoming power to scan the situation, and to make several decisions — whether it should power up the rest of the CC body, "awaken" the organic brain (by stopping the flow of sleep-inducing chemicals), and/or take immediate motive, defensive, or even hostile actions. Though normally trustworthy in such situations, the MadMac may become somewhat unpredictable, especially if the organic elements of its CC have expired.

5.0 Movement

The mechanics of CC body movement involve the use of devices which imitate

the actions of human muscles, contracting and expanding to exert force on parts of a rigid internal frame.

5.1 General Notes

This structure is made of a porous aluminum alloy that is lightweight, durable, and not subject to magnetism. This alloy is composed of 90% aluminum and 10% other metals (zinc, magnesium, copper, and chromium, in that order). Boron filaments are added in the casting process, providing a net tensile strength of almost 8,800 tonnes per square meter (over 300,000 pounds per square inch).

Other frame data:

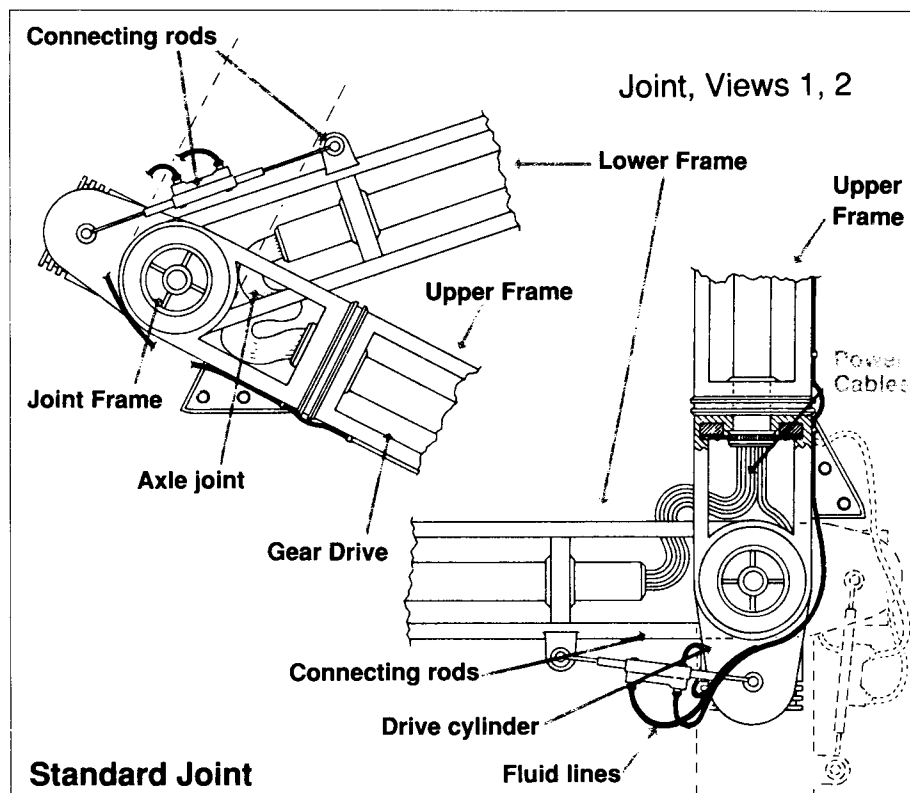
Yield Strength: 8,047 T/m² (275,000 psi)

Melting Point: (aluminum alloy only)
1165° F (640° C)

Brinnell Hardness: 150 (500 kg load)

5.2 Standard Joints

Refer to the illustrations below, which depict the standard mechanism used in most of a CC's joints. The general parts of the joint are the upper frame, joint section, and lower frame. This double joint uses a gear drive for rotation, located at the abutment of the upper frame and the joint section, and an axle for pivoting, which connects the joint section and the lower frame. Powdered graphite coats all mov-



ing surfaces. All power circuits, including motors, are coaxially shielded. All metal parts are made of the same alloy as the frame, and similarly reinforced with boron filaments.

The center strut of the upper frame is encircled by toothed rings (incorporated in the casting). The adjacent part of the joint section contains six small motors, each of which drives a toothed wheel (gear); these encircle and fit tightly into the teeth of the upper frame's ring. The gears do not touch each other, of course. All the gear motors are activated simultaneously when rotation is desired. Six are used so that even if two or three malfunction, the rotating joint can still function.

The axle portion is powered by its own motor, which can produce a 90° turn. This is augmented by two drive cylinders which can bend the axle an additional 45°. Each is connected to the sides of the joint frame and the lower frame by connecting rods. Each drive cylinder is constructed of two single-ended cylinders, mounted together to form an elongating one. Both are powered by a single self-regulating pump mechanism. The axle and drive cylinder mechanisms operate independently.

Fluid is pumped into or from them, causing them to shorten or lengthen, thus exerting pressure on the connecting rods and causing the axle joint to pivot. The fluid used is primarily water, with chemical additives to prevent changes of state (i.e., freezing or boiling). The system is also cooled and heated by a thermal control system (see 7.9, page 42).

The pump and motors of each joint use the primary power circuit, but each limb (arm or leg) has its own backup battery as well. If a limb is disconnected from the CC body, it may be radio-controlled. Commands must be prefixed by a complex code signal (different for each CC) that prevents unauthorized use. The radio control system is not operational as long as primary power is the motive force for that limb.

All circuitry and materials in and around a pivot joint are carefully designed to accommodate the movement, of course. The external pseudoskin is sufficiently elastic to bend and stretch as needed, though it loses some of the efficiency of its polarization in the process. To avoid loose wiring, power cables interconnect through a spring-loaded cable feed system in the vicinity of each pivot joint. The maximum angle of a pivot joint, when both axle and drive cylinders are used, is about 135°.

5.5 Pivot Joints

Some joints are designed only to pivot. In such cases, the mechanical construction is a modified version of the standard

joint. Pivot joints are used at all 28 knuckles (2 per finger, 1 per thumb, 1 per toe) and at the ten places where the digits connect to the hands and feet.

Each pivot joint is an axle type, similar to that in a standard joint, but with no drive cylinders attached. They are much weaker than standard joints (primarily since the axle drive motors are much smaller), but can be pivoted up to 135° in either direction from true, for a total maximum turn of 270°. However, the pseudoskin on a finger or toe limits the total angle (the sum of all knuckle turns) to 180° from true. But a CC can still easily touch the back of his or her hand with a finger, for example.

5.4 Neck Joint

Two neck joints are used to simulate the capability of the human neck. Three large gears, each with a separate motor, project downward from the frame of the head. These mesh with the inner part of a ring that is connected to the torso frame and which fills much of the lower neck. A central shaft contains the myriad connections between the head's sensory and sampler mechanisms and the brains capsule in the torso. Above the rotating joint, located just below the ears, is an axle joint powered by two motors.

The maximum rotation of the lower neck joint is 135° (3/8 turn) from normal (forward); beyond that point, the elastic pseudoskin and power cable feed systems are severely stressed. This is a slightly greater turning range than that of which the human neck is capable. The axle pivot has the same range, which far exceeds that of the human neck in a backward direction, but it has slightly less forward movement capacity.

5.5 Gross Movement

In causing body movements, the SINC receives the neural impulses transmitted through four cranial nerve pairs (V, VII, XI, and XII), and routes them to the analogous joint motors. Response is monitored and regulated by the brain and/or MadMac through sensory feedback. The movements require no more concentration than did those of the operator's original organic body. The frequency and speed of such voluntary actions are normally determined by the organic nerves of the CC (i.e. the character's neural score), although control can be delegated to MadMac for faster reactions, but at a corresponding power cost, of course; see Autopilot (5.6, above) and Defense vs. Impacts (Ultraspeed, 7.42, page 41).

A CC normally moves on foot across land surfaces, just as a normal human does. The body can be made watertight

for surface or subsurface operation as well. No flight capacity is included in the basic unit, but long and/or high jumps are possible by using additional power in the leg systems. Leg jets and backpack units can be used to gain true flight capability.

5.6 Autopilot

If desired, MadMac can be instructed to run an autopilot program. The operator must specify the scanning range. (If not specified, the default range is a variable factor of the movement speed.) Instructions can be as complex as desired, and may be modified at any time. The program uses electromagnetic radiation of various wavelengths (infrared, normal, and ultraviolet light as needed, radar, etc.) to scan the area around the CC, to the range specified. While the program is running, MadMac will activate motors as needed to cause the body to avoid obstacles and attacks. This mode of operation is costly in power, and the electromagnetic radiations used are easily detectable by others using the appropriate sensors.

6.0 Senses

The sensory units of a basic CC fall into the same categories as the human senses: sight and hearing (scanners), smell and taste (external sensors), and touch (internal sensors). Most sensory functions are analogous to impulses transmitted through cranial nerve pairs I, II, VI, VIII, IX, and portions of III, IV, and X, all appropriately routed by the SINC.

6.1 Sight

The lenses and image processors in each of a CC's eyes are built to accommodate a wide portion of the electromagnetic spectrum. By concentrating on a given frequency or range, a CC can "see" any of the following: X-rays, ultraviolet light, light visible to humans, infrared light, microwaves, plus television and radio waves.

The eyeball has four lenses (some far more complex than simple optical lenses) and four corresponding image processors. These lens-processor pairs correspond to portions of the spectrum as given in Tech Table 1 (next page). The lenses are equally spaced on the spherical surface, with the processors in opposing positions.

Each of the light projectors built into the body has a primary and a secondary (backup) unit. These lamps are not normally visible, but can be exposed for use by opening panels in the body.

The large 10 cm (4") floodlights (normal light) are located in the front upper

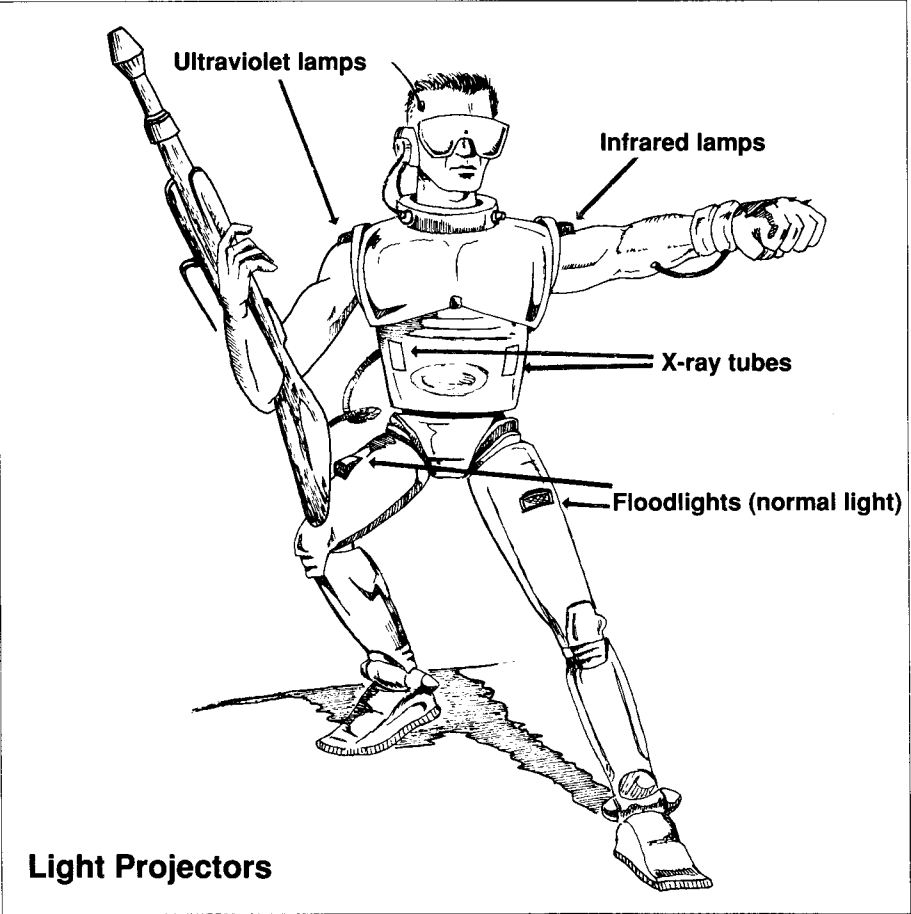
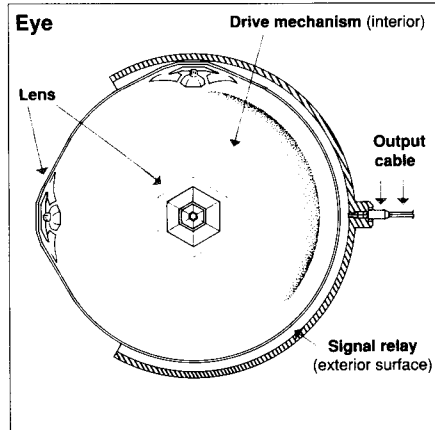
thighs. The IR and UV lamps are small, and project a narrow cone of light that is only visible when the appropriate equipment is used. These lights are located in the shoulders (front), with a separate access panel for each. The X-ray tubes are somewhat more sophisticated, requiring water coolant, and are located in the mid-torso just above the waist (left and right front, again with access panels). All lamps are easily replaceable.

Signals of 10^{12} to 10^6 Hz can be emitted by using flexible diaphragm units. One is located under the skin in the palm of each hand. By cupping the hand, the CC can form these diaphragms into dish-like projectors (miniature versions of conventional microwave and radar units). A tiny broadcasting antenna located in the center of each diaphragm can be mechanically extended to the focal point of the unit for focusing.

By combining various broadcasters and receptors, a CC can perform small-scale scans and tests such as MRI (magnetic resonance imaging) and CAT scans (computerized axial tomography). Both tests were used in the 20th century, but were limited to medical use due to the size of the equipment required. With portability, they are now quite useful in many other fields. For example, CC operatives working in concert — one emitting signals, the other receiving — can examine the contents of a container (whether paper bag, shipping crate, or bomb) with a high degree of accuracy, without opening the container, and in many cases without even touching it.

6.2 Hearing

The interior elements of a CC's ears accept a wide range of input. Though the spectrum of sound frequencies detected is far wider than the human norm (.01 to 100,000 Hz), the operator normally hears only those sounds that a normal person would (16 to 20,000 Hz), thanks to an digital encoding and filtering system used



by MadMac. The operator can instantly shift to wide-band hearing, or limit hearing voluntarily to any specified range or combination — such as ultrasonic (15,000+ Hz) or infrasonic (up to 30 Hz).

Since the ear's mechanisms are not organic, damage due to loudness does not normally occur. By simply concentrating, the operator can identify the exact loudness (in decibels, or Db) of any sound detected. Human range is about 4 to 120 Db; a CC's is .01 to 200 Db. MadMac can also analyze sound reception, duplicating sonar applications underwater, for both direct listening and echo-ranging.

A CC can produce sound with any or all of three projectors. One is a very simple diaphragm located in the back of the mouth, capable of producing a range of sound similar to a normal human's but with slightly larger ranges of both frequency and volume. The other two projectors are the same subskin palm units used for microwave and radar projection, though in this case the diaphragm itself is vibrated, instead of being used merely to guide an electromagnetic signal. To stiffen the diaphragm sufficiently for this application, the fingers of the hand are stretched outwards, as if to signal "stop." These devices

Tech Table 1			
Electromagnetic Radiations detectable by CCs			
Lens	Wave Length	Wave Frequency (Hz) ^a	Radiation
#1	10^{-1} to $10^2 \text{ \AA}^b$	10^{19} to 10^{17}	X-rays
#2	10^2 to $10^6 \text{ \AA}$	10^{16} to 10^{13}	Ultraviolet, visible light, infrared
#3	1 - 100 cm	10^{12} to 10^{10}	Microwaves & radar
#4	1-1000 m	10^9 to 10^6	TV, FM radio, short wave, AM radio
a. Hz = Hertz; 1 Hz = 1 cycle per second			
b. Å = Angstrom; 1 Å = 10^{-10} meter			

can be used to project any sound within the CC's ability (up to 100,000 Hz and 200 Db), and can be used as sonic weapons.

6.3 Smell and Taste

These human senses are general terms for physiological processes in which complex chemical compounds suspended in solids, liquids, or gases are subjected to rudimentary analysis, and the results translated in general terms by the brain. The CC analyzer uses the same basic principles, though in a much more sophisticated and thereby more accurate fashion.

The organic and electronic brains of the CC are located in the body's heavily protected torso, leaving the head is free for other functions. Since that is the highest point of the CC, most of the sensory input devices are located there, including the ears and eyes. The bulk of the head is filled with equipment designed to intake and analyze solid and gaseous substances of all sorts. These mechanisms are collectively known as the "sampler."

The sampler is basically a miniature chemical laboratory with two main chambers and dozens of smaller ones. Its primary purpose is to process air, which is needed for survival of the CC's organic elements. Although oxygen storage tanks

are included with the brain capsule unit, those have limited capacity, and an outside source is always preferred. Air is taken in through the mouth (only) and routed through the sampler. There it is purified by various techniques, then sent down a tube into the torso, where it oxygenates the synthetic blood by passing across a membrane, in exactly the same manner as the workings of a human lung. Since only a small part of the oxygen is absorbed, most of the air continues back up an exhaust tube and is exhaled, again through the mouth.

The substances originally suspended in the air (which are removed before the air is used) are always analyzed. This information is stored in MadMac's memory, and is available whenever the CC so desires. The overall content is continually relayed to the CC's consciousness, the information taking the form of nerve impulses that are translated by the human brain as "smells."

When the air contains potentially hazardous elements, none of it is routed to the torso. Instead, the sampler reports the results of analysis to MadMac, which in turn immediately alerts the operator to those hazards. The detectable substances include both living things (bacteria, viruses, plant spores and pollens, etc.) and non-living substances (such as poi-

sons). A CC can thus smell poison gas, for example, without being affected by it in the slightest way.

Solid and liquid material can be taken in for analysis as well, and this is the secondary purpose of the sampler. The intake tubes for such procedures are in the nostrils of the nose. The complex human nostrils and postnasal sinuses function primarily as air filters. In the CC, those functions are performed elsewhere, as described above, so the unit's nostrils lead directly to the sampler.

The analysis of a substance is always very detailed, but the results can be reported in general or in specific, as desired. For example, after analyzing a droplet of white liquid, the CC could know the approximate numbers of atoms of hydrogen, oxygen, carbon, etc. per unit volume of the sample. Or on the next level of information, the percentages of water, lactose, and other substances could be determined. Most simply, the sample could be identified as "milk." Material taken in for analysis can be stored, if desired, by simple mental command. Anything thus retained is placed in one of the many small storage compartments of the sampler and sealed. Either the sealed capsule or the sample itself can be ejected at any time. The sample can be as small as a few hundred atoms, or as large as 1 cubic centimeter (maximum).

During underwater operations, half of the nasal sampler can be dedicated to filtering and processing water. In this case, the water is not only sampled, but also broken down by electrolysis (using electrodes of gold, minimizing decomposition), and the gases obtained thereby are sent to the air chamber of the sampler for final processing, routing, and possible use.

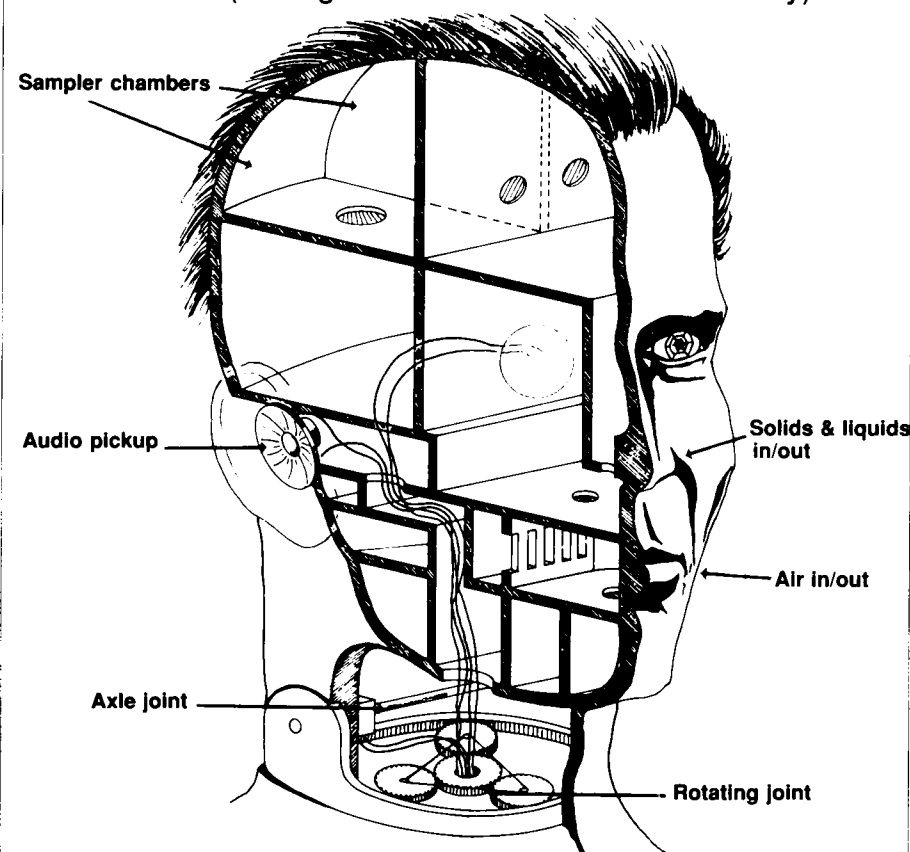
In situations which are hazardous or potentially so, the entire sampler can be instantly sealed. This occurs automatically during the Ultraspeed mode of combat operation (q.v.), and may be done voluntarily at any time. If necessary, the entire contents of the sampler chambers and/or the small storage chambers can be expelled very quickly.

Microscopic particles of waste material from the organic elements of the CC unit are automatically routed to the sampler, sprayed into the air within it, and expelled.

6.4 Touch

The sensory feedback system used by the human nervous system allows the fingers to vary their pressure according to the object being handled. This principle is electronically duplicated in the CC as an automatic function. The operator can pick up an egg or a steel girder without harming either, and without a moment's thought as

Head & Neck (Tubing & drive motors omitted for clarity)



to the amount of pressure that should be applied. More or less pressure can be applied by voluntary action.

Thousands of sensors in the CC's outer skin layer monitor the temperature and other characteristics of the immediate environment. These are quite sensitive and are grouped closely enough to imitate the sensory functions of human skin.

Unlike human skin, no openings (pores) are needed in the CC's skin, but several compartments built into the unit are externally accessible. The seams of these panels are normally tight but not impermeable; they can, however, be hermetically sealed by a moment's concentration.

Other sensors throughout the interior mechanisms of the CC combine with those of the skin to form a comprehensive information-gathering network. This allows MadMac to monitor all operations and inform the operator of malfunctions and damage.

Simple pain, the primitive and often debilitating alarm system of the human nervous system, is almost nonexistent in a CC, except in the case of damage to certain organic elements — the accessory glands and nerves inserted with the brain. The brain itself has no sensory receptors.

7.0 Defenses

The unique mobile weapon called a CYBORG COMMANDO™ unit is the result of pure scientific theory funded and motivated by utter the pragmatism of the military. Its "natural" defenses against damage were designed to counter a powerful and hostile environment. By similar reasoning, it is built with the capacity to affect that environment in various destructive ways. (See Attack Modes, 8.0, page 42).

The CC was constructed as a replacement or reinforcement for armed personnel. Because of this military heritage, considerable thought has been given to its defenses against both direct and indirect hazards. Direct hazards include corrosives, electricity, impacts, infections (poisons and microbes), light, radiation, sound, and thermal changes (heat & cold). Indirect hazards affect a tactical situation generally rather than a specific target. The most common of these is smoke.

A summary of the basic hazards, and inboard CC defenses against each, is given in Tech Table 2 (right).

7.1 Corrosives

A CC's outer skin is resistant (though not immune) to acidic corrosives. The typical defense against such an attack is evasion, though water may sometimes be used to dilute the corrosive. High tempera-

tures can be used to vaporize a liquid corrosive, increasing its volume but reducing the effect per unit of surface area contacted, giving more time for evasion. The optimum defense is to neutralize the substance, but the chemicals needed are usually not available quickly enough or in adequate bulk. Freezing is another alternative, but one even more rarely available.

7.2 Electricity

Electrical attacks could disrupt a CC's inboard power systems, rendering the unit inoperative. Defense is on two fronts: inner circuit protection and the Emmer Net beneath the outer pseudoskin.

7.2.1 Circuit Protection

All of the electrical circuits which make up the CC's "nervous system" are made of superconductors developed in 1986-1991. These materials were the key factor in the so-called "Century revolution" (actually 1990-2010), which rendered many electrical devices created before that time obsolete. The extensive research in cryogenic superconductors prior to this discovery was not wasted, as many of the details of superconductivity (as a class of phenomena) obtained thereby were applicable at all temperatures.

Some circuit protection from electrical and radiation hazards is obtained by using coaxial shielding. Each cable consists of an inner core and outer ring of superconductor, positioned so that they share a common axis (hence the term "coaxial"). These are separated by and externally coated with a synthetic dielectric insulator

(synthetic rubber), which is treated with antioxidants before it is electrodeposited on the metal. The use of coaxial shielding also prevents interference from the Emmer net (see below).

The microcircuitry within and near MadMac is not coaxial. It is instead protected by a specially designed shielding material, composed of layers of gold film for general radiation blockage, alumina-silica ceramic fibers for thermal insulation, and boron carbide (B₄C) for neutron absorption.

7.2.2 External Effects (Emmer Net)

The effects of electricity are first minimized by internal construction. (See above for details.) To deflect such effects externally, the CC uses an ElectroMagnetic (EM) field generator — called the "Emmer" or "Emmer net" — to project a magnetic field around the body (maximum range of about 1 meter/yards).

The Emmer is a network of wires made of an alloy of cobalt and rare earths, not subject to magnetic effects but capable of producing a magnetic field when appropriately powered. It uses magnetism to repel an electrical charge, causing it to ground nearby. The MadMac activates the Emmer automatically when it detects incoming electromagnetic attack formThe net can also be operated voluntarily.

The usual superconductive metals apply power to the emmer net core material. This core is a mischmetal-cobalt alloy (RECO₃). The mischmetal is electrowinned from bastnasite and/or monazite (mineral oxides) in a molten fluoride bath. It is composed of 50% cerium, 25% lanthanum, 18% neodymium, 5% praseodymium, and 2% other rare earths (primarily yttrium and samarium). This core material becomes permanently magnetic after a few uses of the Emmer, but the core material is very thin, and this has little effect. Despite this slight drawback, it is used because it is the only material that produces an electromagnetic field powerful enough to act as an E-M defense.

The field produced by the Emmer also deflects and disrupts all electromagnetic wave forms, including those used for communications, i.e. radio and television signals. (See Radiation, 7.6, page 42.)

7.3 Infections

The organic elements of a CC are internally segregated, and are thus nearly invulnerable to infectious attacks. They are further protected by the filtering mechanisms of the sampler (6.4, page 39).

7.4 Impacts

Defenses vs. impacts include an outer Bufragel layer for absorption and the ul-

Tech Table 2
CC Defenses

Hazards CC Defenses	
Corrosives	Outer skin
Electricity	Inner skin (EMmer net)
Impacts	Middle skin (Bufragel layer)
	Ultraspeed program
Infections	Sampler mechanism
	Outer skin
Light	Outer skin (polarization)
	Mirror shields or smoke screen
Radiation	Inner skin (EMmer net)
Smoke	Statter (electrostatic precipitator)
Sound	Damper (sonic inverter & projector)
Thermals	Outer skin (thermal compensator)

traspeed program for avoidance.

7.41 Bufragel

The CC defense against energy of momentum, or impact damage, is similar in principle to that used in the 20th century "bulletproof vests," though the materials used have been vastly improved. The primary drawbacks of the original version were its transmission of much of the shock effect to the wearer, and its inability to stop specially coated or very-high-speed projectiles. In subsequent analysis and improvement, the goal was obviously to raise the impact coefficient (aka coefficient of restitution) to as close to unity (1) as possible, resulting in an almost completely elastic collision. But since the gross energies of momentum of the objects involved must be equal before and after such a collision, a method was developed to convert some of that energy into another form. The remaining energy could then be deflected.

The basic long-chain polymer principle used in the primitive bulletproof garment was kept, but the new material has an even longer chain and considerably different chemical qualities. It is a colloid, rather than a fibrous material, and a dilatant fluid (inverted pseudoplastic) — that is, it "gives" under low stress, but stiffens and reacts under high stress. Marketed under the trade name Bufragel®, this silvery material is effective within a wide temperature range (14° to 1346° F, or -10° to 730° C), in which it has the consistency of smooth peanut butter. It effectively converts a large percentage of the imparted energy of momentum into radiation (heat, beta rays, and gamma rays), and laterally distributes most of the remainder. Atomic particle releases are minimal and the emissions are in a direction exactly opposite to that of the impacting object, posing a hazard to organic tissue only in extreme circumstances (atypical even of normal combat).

The primary drawback of Bufragel is the ease of its destruction under high heat, for it melts or vaporizes in conditions produced by typical explosives. A secondary and relatively minor drawback is the radio interference produced by the converted energy emissions.

Microseconds after a collision with Bufragel, the impacting object may simply be stopped and fall away, or it may be embedded in the material, or it may be utterly vaporized by the thermal output. The exact result varies by the object's initial velocity and physical characteristics. Embedded materials severely and adversely affect the characteristics of the impact site; a second impact at or near that point may produce results as if it were

unprotected. If the embedded material is removed, however, the Bufragel will flow to refill the impact site. It is partially effective immediately, reaching full protective value when the material resumes stable distribution.

The conventional modern shocksuit was the initial outgrowth of Bufragel development. It is composed of dozens of small, flat pockets of the material, simply sewn together to form a helmet liner, vest, jacket, pants, or full body suit. For typical combat conditions, the minimum size of such a pocket is about 5 mm square and 1 mm deep; smaller quantities disintegrate quickly when struck by a typical bullet. The minimum pocket is effective against several direct hits, but the Bufragel will leak from the hole created by any one hit in about an hour. Larger Bufragel compartments are common on military vehicles and some installations.

In a CC, a self-contained layer of modified Bufragel lies between the outer pseudoskin and the Emmer net. The material is essentially identical, but dozens of small piezoelectric crystal units are embedded in it. In a collision, energy of momentum which is not converted to radiant form, but transmitted instead through the Bufragel, impacts on and is further dampened by these units. Some of the energy is thereby converted into electrical power, providing some (minimal) recharging with every impact. Development is proceeding toward a new variety of Bufragel which converts less energy, allowing more to be laterally transmitted and converted to recharging power.

7.42 Ultraspeed

As an added defense, MadMac contains an ultraspeed program. Its use has a high power cost, typically 10-50 times the rate of operation at normal speed. When ultraspeed is activated, the CC body moves much too fast for the organic brain to grasp, and it is thus controlled entirely by MadMac. True sensory awareness of the actions taken in ultraspeed mode causes confusion in the organic brain, and is thus automatically filtered out. The actions can be reviewed after the program disengages.

In Ultraspeed mode, the body uses any and all means available to destroy, stop, or deflect incoming projectiles. Internal lasers are the primary tools, since mechanical devices (including movement of body limbs) are comparatively slow and difficult to handle at such speeds. However, a CC can easily shoot bullets, for example, to precisely collide with and destroy or deflect other bullets, if MadMac is so instructed by the operator before the program is engaged.

Ultraspeed is normally engaged for a

predefined duration, expressed in any of several quanta — amount of power used, a time interval, a number of missiles countered, or some other measurement. It may be disengaged on command, but the organic reaction time involved is such that a large number of actions may already have been executed and/or be irrevocably in progress before MadMac receives the command.

Ultraspeed will automatically disengage if its use would, in MadMac's judgment, cause the power available to drop below 5% of the maximum total possible for the primary batteries. The program automatically fails to run, giving the same warning message, if the CC's power level is already in that range. This can be overridden by the operator, but is potentially hazardous in such cases. If the warning is ignored and the program run, MadMac will use any and all remaining power, if necessary, in the Ultraspeed defense mode. (See Secondary Power, 4.2, page 35, for results of zero-power status.)

7.5 Light

This term here applies to the range of the electromagnetic spectrum from about 10^{16} to 10^{13} Hz, or wavelengths of 100 to 10 million Angstrom units ($1 \text{ \AA} = 10^{-10}$ meter). It includes ultraviolet (100-4,000 Å), visible (4,000-7,000 Å), and infrared light (7,000-10,000,000 Å).

7.51 Hazards

Light of any sort can inflict heat damage, given sufficient power and concentration. The skin of a CC is polarized and heat-resistant, thus blocking most potentially damaging effects. The "flash effect" of visible light, which can cause temporary blindness to organic eyes, does not affect a CC's sensory apparatus, since all such input is converted to electrical signals and thus easily and automatically filtered.

7.52 Polarization & Deflection

Polarization also gives the outer skin some resistance to lasers, but not much. However, since laser attacks can easily be reflected, hand-held "mirror shields" of various sizes provide inexpensive and often adequate defense. Once the position of an attacking laser is known, further attacks can usually be deflected. With foresight, skill, and luck, an incoming laser blast can sometimes be reflected back on the attacker with minimal loss of energy. This tactic is far less improbable when the attacker uses an initial low-power aiming phase, allowing the CC to move the deflector into position before the intensity reaches the second (damaging) level. (See Lasers, 8.2, page 43.)

7.6 Radiation

This term here applies to the ranges of the electromagnetic spectrum immediately below that of light, i.e. gamma rays (10^{20} to 10^{21} Hz) and X-rays (10^{18} to 10^{19} Hz, or 0.1 to 100 Å), and those above that range, of which only microwaves (10^{10} Hz, or 1 mm to 30 cm wavelengths) are known to be potentially harmful. All such radiations are somewhat blocked by circuit shielding (q.v.), and can be countered by using the Emmer net, in the same manner as against electrical hazards (q.q.v.). The end result of the latter differs slightly in that these radiations are deflected but not deactivated through grounding, as occurs with electrical charges. The radiation may affect nearby organic and inorganic objects, as it loses little of its force in the process of deflection.

Normal electronic communications are disrupted by the Emmer effect, since these radiations are part of the electromagnetic spectrum. The Emmer effect cannot as yet be limited to certain wavelengths, though some progress has been made in this area. And although radiations of the frequencies of radio and television waves are not harmful to human or other terran life forms, they may theoretically affect certain extraterrestrial forms, presumably through concentrated high-power applications.

7.7 Smoke

Certain tactical maneuvers can be used either defensively or offensively. The most common is the use of smoke, which hampers normal visibility.

7.71 Effects

Hot smoke blocks infrared scanning, and radioactive smoke blocks most other scanner frequencies. It is an area-attack form as well. Normal, hot, and radioactive smoke all block most laser use.

7.72 Electrostatic Precipitation

Any such area attack involves particles suspended in the air, and all such attacks can be countered by electrostatic means. Common in industry, this technique uses charged plates or rods to attract the particles, removing them from the air.

If any conductive metals are nearby, CCs can use power to charge them electrically, thus creating an unsophisticated but quite effective electrostatic precipitator. The power cost is rather high, however, as imparting a sufficient charge on a good conductor requires the expenditure of about 15,000 volts per inch of material. By expending 1 PU per inch of material per minute of use, a CC can cleanse 100 cubic feet of air per inch of electrode per minute of operation by precipitating the particles

from it. Note that two electrodes, and the total length of both, must be calculated.

Example: To destroy a spherical smoke cloud 10' across (about 4,200 cubic feet) using two metal rods, each a foot long (24" total length), a CC must pass the charged rods through the cloud for 1 3/4 minutes ($4,200 \text{ cu ft} / 24"$), thus expending 42 PU ($24" \times 1.75 \text{ minutes}$).

7.8 Sound

Sound is carried by gross movement of a medium (usually air) in wave forms of alternating high and low pressure, and is thus extremely slow compared with radiant or subatomic particle effects. Damaging sonic effects can be hazardous to anything, organic or otherwise, but can usually be countered unless they are of extremely high power.

Potentially damaging sound is first detected by the CC's sensory systems (q.v.), which note the atmospheric disturbance created thereby (invisible to human eyes) and automatically alert the operator. Such detection is often at some distance from the actual sound source. No automatic programs or protections can be applied; direct and voluntary action must be taken to offset the hazard.

Upon command, MadMac analyzes the incoming sound and inverts the wave forms, duplicating their respective intensities and frequencies but at inverted phase. The operator may project the inverted wave forms through the hand speaker units mounted in the palm, producing more sound which partially or totally blocks the original sonic effect. The amount of power needed varies by the volume of the incoming sound, but typically (for battlefield sonic weapons) only 2-5 PU are required, or double that against large semi-mobile weapon units. This is far less than the amount of power used to produce the damaging sonic effects initially, but the inverse wave decreases the impact of the sound sufficiently to prevent damage. If desired, the CC may project enough power to completely negate or even overpower the other sound.

The area affected by inverse wave projection varies by the directional movements of the sound waves involved. If a CC stands beside a sonic weapon projector, for example, and projects the inverted waves in the same direction (overlapping), most or all of the sounds are neutralized. The same applies if the CC is before the projector, aiming toward it. If the CC projects the inverse wave at some other angle, however, only the sound within the area of intersection is affected, and both sonic effects (the projector's and the CC's, both having damage potential) resume once past that area. Furthermore, the damage potential of the sound within that

intersection is only partially negated, since the wave forms are at some angle to each other. In other words, the sound is scrambled somewhat, but not enough to prevent all damage.

7.9 Thermal Effects

Subsurface circuits and tubes heat and cool the pseudoskin and joints as needed, usually as directed by MadMac. The primary system is located in the outer skin, immediately below the external surface. The heating circuits are standard and elementary, though the elements used are very small. The thin tubes are filled with gas which can be cooled and circulated. The gas will react and solidify upon contact with normal air, and the system is therefore self-sealing. To allow for this, micro-gates can route the flow along many different paths.

This heating/cooling system can change the pseudoskin temperature very quickly, up to 120° C (248° F) per second, thus providing excellent protection against attack forms based on heat and cold if given sufficient advance warning, and very good reactive defenses.

In emergency or high-stress situations, system priority is given to the pseudoskin, not to the secondary thermal controls surrounding joint mechanisms (see Movement, 5.2-5.5, pages 36-37). Overall unit integrity is maximized thereby. In extreme circumstances, some or all limb movement may be temporarily halted or weakened due to the freezing or boiling (respectively) of the hydraulic fluid used. Since such systems are sealed, few or no losses normally occur in the disrupted period, and subsequent thermal control quickly restores normal movement. If freezing causes component damage, a joint may suffer either weakness, if one of the two drive cylinders is damaged, or flaccidity, due to fluid loss pursuant to reliquification. Leakage does not normally affect internal circuitry, nor does damage to one joint affect any other, because of the modular nature of the joint construction and control.

8.0 Attack Modes

The basic CC's inboard attack modes use light, sound, and sheer electrical force. Each weapon use thus requires the expenditure of some amount of power. The amount is chosen by MadMac if an automatic program is in use, or by conscious decision otherwise.

8.1 Electrostat

A CC can accumulate an electrical charge of high voltage on the first finger of

either hand by using a virtual duplicate of a Tesla coil or Van de Graf generator. This is a variable and unstable attack form at best, since the discharge will occur as a "lightning bolt" effect as soon as the built-up potential is able to jump to the nearest ground. It can thus be quite effective at close range, but cannot usually be directed against targets more than 3 meters/yards distant. It causes little or no organic damage, since the bolt has low amperage, but it can have severe effect on neural or electrical systems because of the high voltage. It may cause shock, stunning, or even death in a living target, or it may have no effect. It may cause severe damage to the hardware or software of an electrical or computer system, or it may be drained off harmlessly. In special cases, the bolt might even be consumed and stored as a power recharge, as with a CC target.

8.2 Lasers

A small laser is built into each forearm. The firing ports (panels) are located where the heads of the metacarpal shafts of the 3rd & 4th (index & middle) fingers would be in a human body. A focal lens is located just inside each firing port.

The laser can only be used when the hand and wrist are held in the proper position, such that the relatively flat outer part of the arm is perfectly aligned with the back of the hand. Once the arm is in the proper position, the ports can then be opened and the lasers used. This hand position is sometimes called the "eagle claw" in martial arts training.

Each laser is relatively standard, consisting of a rod of synthetic translucent aluminum oxide colored by specific amounts and types of impurities. When the rod is exposed to intense light from a xenon flashtube, it produces a characteristic beam of coherent light. The beam is quite narrow, about one milliradian (.05°) wide. The rate of power usage varies by the duration of the burst, i.e., inferentially by the resistance (material) of the target. In combat, a single or double burst is normally used, lasting about 1/10 second and using 5 PU (Power Units). Such a burst will burn through 3-6 meters/yards of unprotected organic material. Typical armor accounts for 3 meters/yards of such penetration. If the beam is concentrated for 1/5 second (10 PU) it can burn through up to a foot of brick wall; a full second (50 PU) will penetrate 5 cm (2 inches) of solid steel. A liquid can be vaporized with the laser, but its thermalconductive properties may disperse the heat quickly.

8.3 Microwaves

A CC can emit signals in much, but not all, of the electromagnetic range detect-

able by its sensors. Though a CC has no gamma-ray projector, it can produce signals in the range of ultraviolet, normal, or infrared light (using lamps), microwaves and radar (using the palm projectors), radio waves (using the central antenna), and X-rays. Of these various emissions, only microwaves are known to be directly and quickly useful as attack forms. These are reflected by metals, but can penetrate most other substances.

Using much the same method as for sonic attacks (see 8.4, next page), a CC can project microwaves by aiming one or both palm projectors at a target. Though the sonic mode vibrates the palm membranes as speakers, the microwave signal comes from a small source antenna at the center of the palm units, and is merely focused by them. Damage is thus inflicted by heating the target.

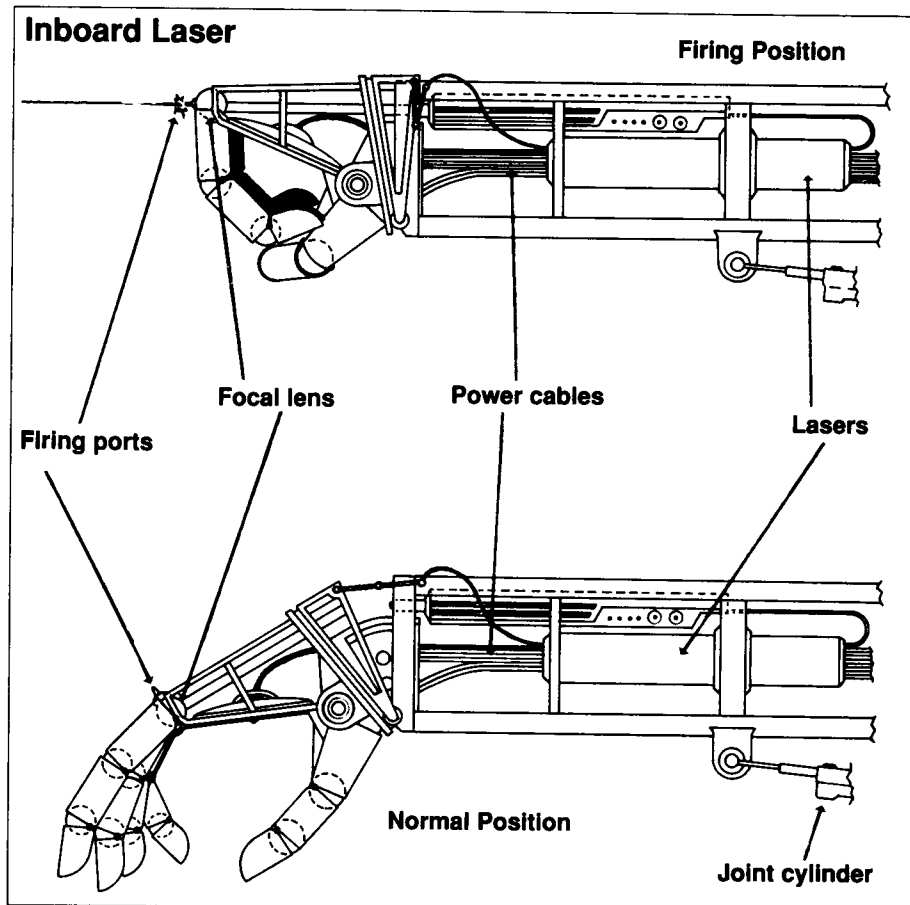
8.4 Sonics

Every object vibrates at some frequency, which is called its natural frequency of *resonance*. An object will vibrate when subjected to sound impulses of the same frequency as its resonance. If such sounds are of arbitrary or random frequencies at first, and are then focused on the proper resonance, an object can be made to vibrate increasingly faster and

more intensely, causing damage to the object. This is the principle used by a person who is able to shatter a glass by singing.

A CC can use the sound projectors in the palms of the hands to similar effect against a wide range of materials, not just fragile objects. In general, items made of a single, dense, regular substance can be greatly affected; objects composed of several materials of irregular composition are less affected. Most organic material falls into the latter category; most metals and other inorganic substances are in the former.

Sonic resonance as an attack form is time-consuming, but does not use great amounts of power. The noise need not be loud, but it must be accurately aimed and of the proper frequency. If the appropriate sound is applied from both hand projectors (or from two CCs, each using one hand) against a stationary target with a resonance known either exactly or approximately, damage can be produced within four seconds. If the resonance must be found, the process can take twice as long, assuming full sensory scanning and analysis capacity on the CC's part, or even longer. The use of a single palm projector may result in insufficient power application, for no effect unless the target is very near (within 3 meters/yards).



8.5 Other Weaponry

Any CC can use various external attack devices, of course. Nearly any object propelled by the force of CC "muscles" can cause physical damage to a target. The inherent disadvantage in all devices, of course, is their limited viability; guns require ammunition, and are of little use when that ammo runs out.

The amount of accessory equipment issued to a CC depends on the details and goals of the assignment. Such equipment may range from nothing at all (common, especially for novice CC operators) to full combat packs including grenades, guns of various sorts, portable missile launchers, mines, and other nasty things. When new weapons require field testing, CCs are usually selected for the task, since they tend to bring back results and equipment more reliably than human soldiers.

8.6 Tools

Special additions to the hand provide a minimum assortment of built-in tools for fine detail work. The index finger contains a blade and a chisel; the little finger contains a drill that uses interchangeable bits. Each tool may be extended to a maximum length of 10 cm (3.94"), and all are constructed of the same material as the CC frame (reinforced beta-alumina), so they require only infrequent maintenance.

The chisel doubles as a screwdriver, and can be easily used to convert a Phillips-head screw into a normal one. The blade is as sharp as a good scalpel and a thousand times as durable. Using vision magnification, a CC can easily slice the thickness of a piece of paper into several layers.

The rotation speed of the drill can range from 1 to 100 rotations per second, under the precise control of the operator, and can function equally well in either direction of rotation. Four interchangeable bits are stored in the lower edge of the hand, and any one selected can be moved into position and extended in approximately 0.4 second. The widths are 1, 2, 4,

and 8 millimeters (0.3"). All bits are suitable for use in any material, though they do suffer notable abrasion when used on materials of Mohs hardness 9.7 or greater, such as silicon or boron carbide.

8.7 Skills

All of the foregoing information notwithstanding, a CC's most effective weapon is its mind. With the range of information available to it in both normal (organic) memory and computer storage (pseudo-memory), a CC of even moderate experience should be able to assess and resolve nearly any problem encountered. The operator should be able to handle peaceful and hostile situations with equal ease. Not all of the enemies are aliens, and many battles can be avoided with the proper use of conversation, deception, and/or simple evasion.

Finally, a CC's primary purpose is to survive, using any and all skills, knowledge, and abilities to that end. A CC is a highly sophisticated, expensive, and non-expendable resource of mankind's forces. Victory is of course a preferred result of operations, but that is almost always less essential than the return of the CCs involved, whether wholly or partially intact. Total defeat is impossible as long as the CCs live to continue the fight.

9.0 Conclusion

The current design of the CC unit reflects its potential as a military weapon, defense, and all-purpose tool. The innate balancing factor is of course the human mind, particularly the conscience. The CYBORG COMMANDO unit appears, in one respect, to be the ultimate "smart bomb" — powerful, controllable, and capable of situation analysis and voluntary actions.

Though it is indeed unfortunate that the BRP is non-reversible at this time, this topic has an extremely high priority in the national defense schedule, and breakthroughs are expected within 3 years ($\pm$

10%). However, despite the potential convenience of using CC bodies as if they were mere equipment, this development introduces the possibility that such equipment might be stolen. Security plans are thus in progress as well.

Sawtell believes that a MadMac, once accustomed to interaction with a human brain, could become aberrant upon or shortly after the termination (albeit temporary) of such interaction. He also believes that a MadMac may orient itself to one particular user, and may function unsatisfactorily with others. Kotusu disagrees on both counts, of course; but these possibilities are being investigated nevertheless. Sawtell's unsubstantiated remarks have often been more productive than Kotusu's considered opinions.

9.1 Addendum

(The following is a verbatim transcript.)

where's the punctuation
button on this fardle
voicewriter . . . ; okay uh

On Saturday January 13 2035
an enemy invasion force
penetrated T.A.U. airspace and
landed an invasion force. It is
now apparent that all other
regions of the world were
similarly and simultaneously
invaded. The enemy, apparently
extraterrestrial, fardle.

That makes me sound like a
fardle idiot but I don't know
how to back up this thing oh at
least it censors itself okay
then fardle it well uh.

Over 95% of the world's
military forces and
installations were vaporized in
the attack. We now believe that
the enemy force is
extraterrestrial.

Man now faces the ultimate
crisis. The existence and,
indeed, success of the CC design
appears to be our only hope.

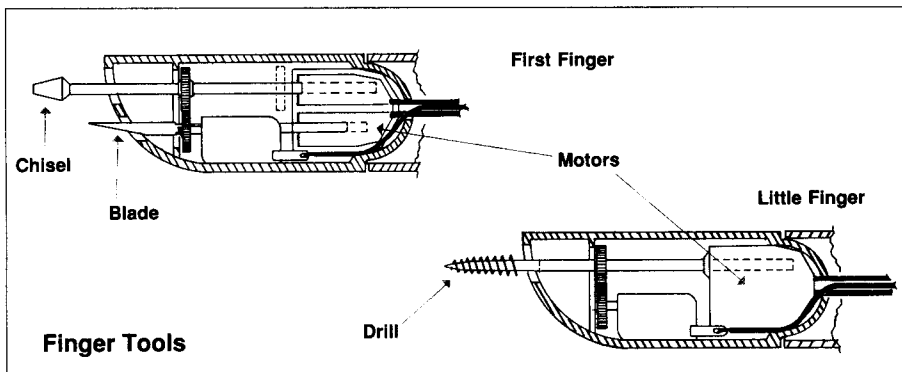
Appended 1.17.35, Colonel
D.P. Garner, TAUCOM Nawlins

9.2-9.8. Reserved for future addenda.

9.9 APPENDICES

All appendices have been deleted from this package for security reasons. When submitting requests, refer to document packages as follows:

Names deleted by order of the Union
Security Council



The CYBORG COMMANDO™ Force

The CCF is an elite group of specially selected volunteers who have been chosen by a tight screening process to become the best military personnel the world has ever seen. Less than one person in a million makes it through the tests and is allowed to join. Welcome to the Force.

History

From the start of the century, scientific research facilities in many countries pursued topics which eventually led to the creation of the CYBORG COMMANDO operative in 2024. As its originator, the United States of America maintained the leading edge of new developments in the field. But many of the individual CC components were produced by independent businesses (mostly American and Japanese), and could not be suppressed. Information sharing was also characteristic of this political era. The CC Force thus quickly became an international organization.

In the late 20's, many of the Bloc-oriented bases and offices were expanded to include the functions necessary for CC support. Many new bases were also created.

A special task force compiled guidelines for base construction and layout, which were loosely followed by most of the nations involved. The five types of bases represented in the CC Force network are: Command, Primary, Secondary, Tertiary,

and Research. Physical layouts, sizes, and even staffing vary widely, even within a single base type. The variable factors include the state of technological development in the country maintaining the base, the number of bases in that country or region, and so forth.

There are 176 CC operatives in existence just prior to the invasion, nearly three-fourths being Type-1 CCs—robotic types, lacking some of the attack/defense features of the state-of-the-art Type 2 (the typical player character). Many of the Type-1 CCs were lost in the invasion, but only eleven Type-2 CCs were destroyed, and all of those losses occurred during the depopulation of major metropolitan areas worldwide. Of the 81 CC survivors of the invasion, less than half are Type-2. The few new recruits that can be found and placed into CC bodies, plus this mere handful of Type-2 survivors of the invasion, are the player characters.

Base Descriptions

Each type of CC base fulfills a specific function in the Force. Most nations of the world have at least one base, though not all have CC operatives.

Command

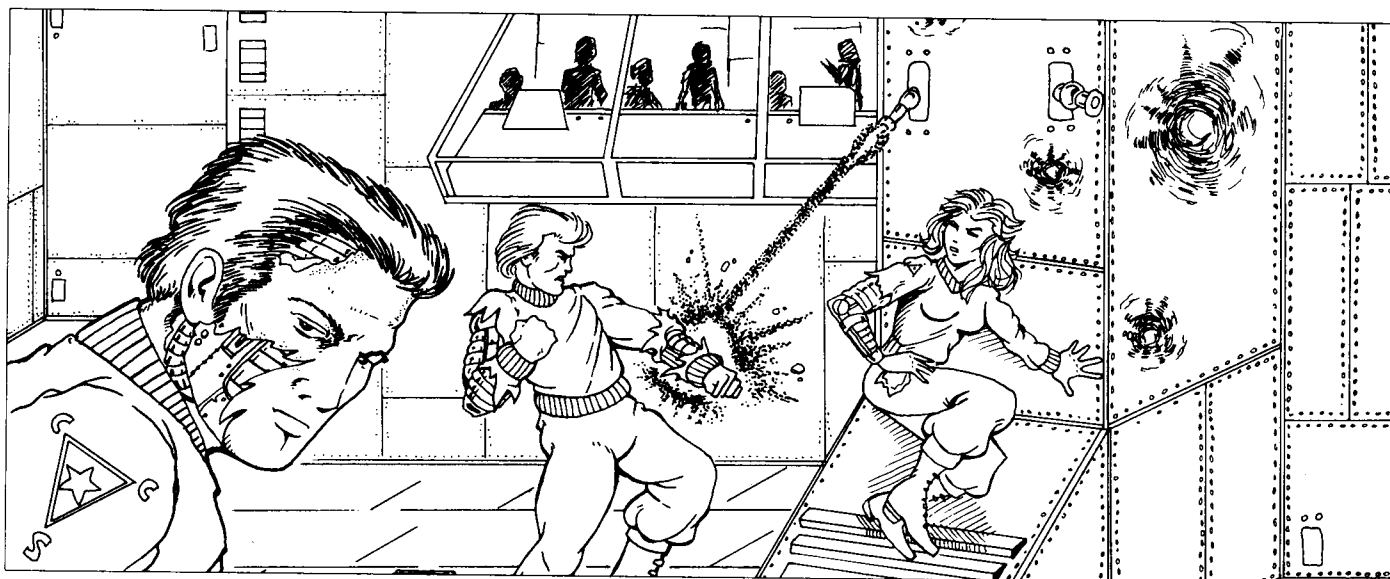
In a large country, a Command base is typically a grouping of offices that has few

or no facilities unique to CC operations. In a small country, by contrast, the Command base usually has full Tertiary base facilities (see below). Some countries placed their Command bases in politically important areas; others placed them in militarily advantageous areas—well-defended, small and inconspicuous, or whatever.

The functions of a Command base are often purely bureaucratic, though it ideally provides good strategic functions as well. The task of gaining public acceptance for the CC concept required a serious promotional effort, sustained by governmental funds and coordinated by personnel at these bases.

Primary

The Primary base facility is the backbone of all CC operations. It is typically a large complex with several buildings and good nearby technological support, including power, high-tech services, etc. A CC operative can only be permanently assigned to a Primary base, though CCs are often given temporary assignments elsewhere. In addition to general CC support, the personnel at a Primary also handle the testing of candidates (a complex procedure, since psychogenically talented individuals are preferred) and the training and special education of those accepted. Some Primaries even include medical facilities for the Brain Relocation Procedure.



CCF: Support Personnel

Primary bases are often located in or very near major cities, since those are the principal sources of technology, transportation, and communications. For military considerations, few Primary bases are located in or near the largest cities of the world. Nor are they placed in military bases, for those areas would be endangered in the event of a major conflict. Some few Primaries in the world double as Command bases, notably in small nations.

A Primary base is always located on either a major river or a seacoast, for various reasons. Not only is water an absolute requirement for the "normals" (non-CCs) on the base, but it is also used for power, since every Primary has its own turbine or pressure/temperature-differential generators. The former type generates power by moving water; the latter uses the difference in temperature and pressure between the top and bottom of the ocean water. Waterways also provide transportation in the event that more typical transportation modes are disrupted (i.e., in wartime), and hidden travel is still best accomplished underwater. Most Primary bases have their own submarines, both mini-subs and large nuclear types.

A Primary base must be completely staffed at all times. From 5-50 normals are needed for recruitment, testing, training, and miscellaneous details, depending upon the size of the metropolitan area and the base itself. (After the invasion, a Xenospecialist is added if possible.) In addition, at least twelve highly skilled specialists are needed to support each CC operative, as summarized (right).

Secondary

A Secondary base is usually nothing more than a building or small complex stocked partially or fully with supplies. Each Secondary is dedicated to a particular Primary base, and its sole purpose is to function as a Primary in the event that the original is lost.

When several Primaries were depopulated during the invasion, Secondaries were selected and activated according to plan. At Primaries where no CC operatives survived, the Secondaries were activated by other personnel, who began trying to obtain replacement operatives through the new channels of the command structure.

Standard procedures require that each Primary have four Secondary bases, all scattered in the same general vicinity. Thus, in case of war, at least one Secondary is likely to survive nearly any conceivable attack pattern.

A Secondary typically contains a master computer, food and water reserves, two power generators (not used unless

the base is occupied), lab facilities, a communications station, critical CC replacement parts (such as 2-5 unactivated MadMacs, spare hand, leg, and head units, etc.), weaponry, and ammunition. Staffing at a Secondary base is often minimal, and may consist only of one or two security guards.

Tertiary

A Tertiary is often used as a temporary base by CC operatives assigned to missions far from their Primaries. Tertiaries resemble smaller versions of Primaries, but they have fewer personnel and resources, and no Secondary bases for backup. No CCs are permanently assigned to a Tertiary base.

Command bases in small countries are often fully operational Tertiary facilities as well. If a Command/Tertiary base shows itself to be highly efficient when CCs are "loaned" to it for temporary assignments, it may be upgraded to Primary status and assigned a CC operative.

Research

There are few CC bases dedicated only to research, and some of these are transient units with no immobile facilities. Research "bases" may request CC operatives for specific purposes. They also conduct general tests in challenging climates such as deserts, arctic conditions, extremely mountainous regions (e.g. the Himalayas), space (at the Orbital Station), and extraterrestrial conditions

(i.e., the Moon). Such testing is not necessarily CC-specific; research bases do much general scientific work.

Most Primary bases also have some less exotic research facilities, as do some combined Command/Tertiary bases.

CC Support Personnel

Normals (CCF members who are not CCs) performing the following functions are found at every Primary base, and often travel with CCs on temporary assignments. Each position requires extensive knowledge of both theory and practical applications, the latter including repair & replacement of parts.

Except for the Base Commander, all these personnel are required to support one CC. Those Primaries to which multiple CC operatives are assigned must duplicate the entire support staff for each; this results in effective monitoring and maintenance of every CC. The requirement ensures the availability of an adequate number of fully trained and experienced specialists. Support personnel are rotated with some frequency between Primaries within a Bloc.

The nicknames given below each title are commonly used by and between CC operatives. In the presence of normals, however, the degree of usage varies by the reactions of the individuals involved.

Armorer

Guns, Cue

The armorer handles CC inboard weapons and munitions, carried weapons

CC Bases & Staffing

	E.C.	P.A.U.	T.A.U.	U.A.	U.N.O.	World
Bases						
Command	24	26	30	13	11	104
Primary	5	9	13	1	2	30
P & C*	2	3	0	3	4	12
Secondary	28	48	52	16	24	168
Tertiary	12	26	27	3	13	81
Research	2	5	5	2	5	19
Total all	73	117	127	38	59	414
Initial Staffing						
Type-1 CCs	28	41	25	13	20	127
Type-2 CCs	7	9	25	3	5	49
Total CCs	35	50	50	16	25	176
Invasion Losses						
Type-1 CCs	20	29	22	4	9	84
Type-2 CCs	1	5	4	0	1	11
Total CCs	21	34	26	4	10	95
Post-Invasion Totals						
Type-1 CCs	8	12	3	9	11	43
Type-2 CCs	6	4	21	3	4	38
Total CCs	14	16	24	12	15	81
*P & C Combined Primary & Command Base						



CCF: Rank & Advancement

of all sorts used by both CCs and normals, and combat training in general.

Commander

Boss, Dad

The Base Commander organizes and manages all personnel and activities, including mission assignments; also general strategy & tactics.

Communications Specialist

Sparks, Seemie

This individual is responsible for all communications, including CC communication units and the base systems. The same person doubles as security officer to handle codes; sometimes also an expert in psychogenic communications.

Computer Technician

Brainy, Little Mac

This tech is responsible for MadMac adjustment, program debugging, and general care, plus programming, operation, and repair of base computers.

Data Analyst

Cruncher, Watcher

The data analyst collects, replays, examines, evaluates, and summarizes MadMac records of CC field operations.

Defense Systems Technician

Shield, Mother

The DST is responsible for CC defenses, including the Emmer net, Bufragel layer, and special ultraspeed operation.

Liaison

Mouthpiece, Shovel

Liaisons are hired for diplomacy & tact. They handle information exchange between the CC base and the local political and conventional military establishments.

Mechanical Technician

Tinker, Wrench

The tinker maintains the CC frame, motors, and other mechanical devices, and also handles general repairs for all base devices, including everything from vehicles to vending machines.

Medical Doctor

Doc, Bones

The doctor is responsible for the care and regulation of the organic elements (brain, associated glands, circulatory system, pharmacy, etc.) of the CC form.

Power Technician

Magoo, DC

The power tech is responsible for CC Primary, Secondary, & Tertiary batteries plus associated circuits, plus power systems for base operation.

Psychiatrist-Psychologist

Shrink, Inkblot

The shrink cares for and regulates the mind of the operative and, if necessary, related applications to the MadMac.

Sensory Technician

Peeper, Censor

The technician is responsible for maintaining all CC sensory systems, including eyes, ears, skin sensors, sampler, and related hardware.

Ranks & Advancement

Though the CCF is organized as a military group, its members are much more than soldiers. CCF personnel, normal humans as well as CCs, have taken the leading positions in the world's technological research, the space program, and many other vital areas.

But since the CCF personnel frequently interact with conventional military forces, all CC operatives are given a military rank. Because of the extensive education and training enjoyed by all CCs, the ranks given are three grades higher than those of military personnel with comparable experience and responsibility. Within the CCF, the normal (lower) ranks are used, but the higher rank applies whenever interaction with conventional military personnel occurs.

A CC character gains an increase in rank whenever two conditions are met. First, the character's total SP must reach the amount indicated for the next rank. Second, the character must be examined by a board of at least three superiors, all of whom must exceed the character's existing rank (before promotion) by at least three steps, and who must in any event hold the rank of 2nd Lieutenant or higher.

Such a review is essentially a formality, however, and the promotion is always approved unless special circumstances apply, such as flagrant disobedience, repeated failures in mission goals, inability to cooperate with peers, etc.

If a promotion is disapproved, the character is automatically reviewed after each two missions thereafter until he or she passes the examination. If a character gains enough SP to reach an even higher rank without passing the examination for the lower one, a special review is conducted to see if the CC is worthy of any rank whatsoever, and to examine carefully all the details of his or her entire service. If this review is passed, the character gains the lower rank, but must still pass a normal examination to gain the higher one. If the special review is failed, however, the character is removed from active service and reassigned in a support role, to be restored to his or her natural body as soon as possible and dismissed dishonorably from the CCF.

Since the SP gain that results in a promotion represents a considerable amount of experience in the field, the character's Combat Rating — the number which, if not exceeded in an attack roll, indicates a clean miss — improves at a rate proportional to rank.

Various other minor benefits come with higher rank, as does greater responsibility. In these other ways, the CCF is quite similar to the conventional military.

The CC ranks, the SP required for each (by game type, for either the basic or the advanced game), Combat Ratings (CR) by rank, and equivalent ranks in conventional military forces are summarized on the following table.

SP Requirements by Game Type

Basic	Adv.	CR	Physical Stat	CC Rank	Equivalent Rank of Conventional Forces
60	180	10	100	Private	Corporal
80	240	9	110	Private First Class	Sergeant
110	330	8	120	Lance Corporal	Field Sergeant
150	450	7	130	Corporal	Master Sergeant
200	600	6	140	Sergeant	First Sergeant
260	780	5	150	Field Sergeant	Sergeant Major
330	990	4	160	Master Sergeant	Second Lieutenant
410	1230	3	170	First Sergeant	First Lieutenant
500	1500	2	180	Sergeant Major	Captain
600	1800	1	190	Second Lieutenant	Major
710	2130	1	200	First Lieutenant	Lieutenant Colonel
830	2490	1	210	Captain	Colonel
960	2880	1	220	Major	Brigadier General
1100	3300	1	230	Lieutenant Colonel	Major General
1250	3750	1	240	Colonel	Lieutenant General
1410	4230	1	250	Brigadier General	General

Combat Sequence

Command Phase

Declare actions & targets for all phases (both Cycles). Movement is always an option during any phase in which you are not attacking; you need not declare movement during this Phase.

Action Phases, First Cycle

- Phase 1:* Zap weapons (light, microwave, magnetic)
 - Phase 2:* Fast projectiles (device-hurled)
 - Phase 3:* Slow projectiles (self-propelled)
 - Phase 4:* Hurlled items and projected substances (e.g. fire, gas, or acid throwers)
 - Phase 5:* Physical blows, sonic weapons, & misc.
- Action Phases, Second Cycle**
Phases 6-10: As 1-5 above

Movement Rates

At standard rates, your CC can move...

- a #1 hex in 1 Phase
- a #2 hex in 1 Combat Turn (CT)
- a #3 hex in 1 Active Turn (AT)
- a #4 hex in 1 Standard Turn (ST)
- a #5 hex in 1 Travel Turn (TT)
- a #6 hex in 1 Day (a full 24 hours)

Standard Time Units

- 1 Phase of combat = 0.86 seconds
- 1 Combat turn (CT) = 8.6 seconds
- 1 Active turn (AT) = 1 minute 26.4 seconds
- 1 Standard turn (ST) = 14 minutes 24 seconds
- 1 Travel turn (TT) = 144 minutes
- 1 Day = 1440 minutes
- 1 Day = 10 TT = 100 ST = 1,000 AT = 10,000 CT

Distance Scales

The number in column one (below) is used in referring to either individual hexes or general scales; for example, a "number-one hex" appears on a "Scale one map" (i.e. a map overlaid by hexes which are each 10 meters or yards across). Use either Metric (M) or English (E) measurements — *not both!*

M: Metric System

Number	Distance in meters	also known as...	Approximate English Equivalent
0	1	100 centimeters	3 feet 3.37 inches
1	10	1 dekameter*	32.8 ft. (10.9 yds)
2	100	1 hectometer*	328.1 ft. (109.4 yds)
3	1,000	1 kilometer	3,280.8 ft. (1,093.7 yds)
4	10,000	10 km	6.2 miles
5	100,000	100 km	62.1 miles
6	1 million	1 megameter	621.4 miles
7	10 million	10 meg	6,213.7 miles
8	100 million	100 meg	62,137 miles
9	1 billion	1 gigameter	621,371 miles
10	10 billion	10 gig	6,213,712 miles
11	100 billion	100 gig	62,137,121 miles
12	1 trillion	** 1 terameter	621,371,212 miles

E: English system

Number	Distance in yards	also known as...	Approximate Metric Equivalent
0	1	3 feet	91.44 centimeters
1	10	30 feet	91.44 meters
2	100	300 feet	91.44 meters
3	1,000	0.568 miles	914.4 meters
4	10,000	5.68 mi.	9,144 kilometers
5	100,000	56.8 mi.	91.44 kilometers
6	1 million	568.2 mi.	9,144 meg
7	10 million	5,681.8 mi.	91.44 meg
8	100 million	56,818.1 mi.	91.44 meg
9	1 billion	568,181.8 mi.	91.44 meg
10	10 billion	5,681,818.1 mi.	91.44 gig
11	100 billion	56,818,181.8 mi.	91.44 gig
12	1 trillion	** 568,181,818 mi.	91.44 gig

... and so forth, to whatever extent you like. A #16 hex would be about 1.06 Light-Years (LY) across.

*not in common usage; the actual number of meters is normally given.
 ** or 6,685 AU (Astronomical Units); 1 AU = the mean distance from Earth to the sun. The solar system is about 8 hexes across at Scale 13 (79 AU).

CYBORG COMMANDO™ GAME

CHARACTER RECORD

Character Name: _____

Player Name: _____

STATS

	MENTAL	NEURAL	PHYSICAL	
			Natural	CC
Capacity	_____	_____	_____	_____
Integrity	_____	_____	_____	_____
Recovery	_____	_____	_____	_____

★ Psychons _____ Current total: _____

STAT-BASED DATA:

Skills _____	Actions _____	Dmg _____	<u>Heft</u>
Train _____	Speed _____	Heal _____	Throw _____
	EP _____		Carry _____
	Rest _____	IP _____	Lift _____

IP	CURRENT TOTALS	EP
----	----------------	----

SKILL SCORES

Self	MM	Total	Skill Area	Self	MM	Total	Skill Area
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____

IPs by Location

Original Current

Head

L Arm

R Arm

L Leg

R Leg

Body

Reserve SP

Other personal data, items carried, etc.: use other side.

CYBORG COMMANDO™

SCIENCE FICTION ROLE-PLAYING GAME

CAMPAIGN BOOK



by

Gary Gygax
Frank Mentzer
Kim Mohan

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NEW INFINITIES
PRODUCTIONS, INC.

CYBORG COMMANDO™

SCIENCE FICTION ROLE-PLAYING GAME

by Gary Gygax, Frank Mentzer, & Kim Mohan

Campaign Book

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Introduction

The year is 2035; the place, Earth itself. The heroes are the CYBORG COM-MANDO™ characters; the enemies are aliens who have already invaded Earth.

If your "role-playing" games consist mostly of combat, you will need little more than the charts on the back cover of this booklet. The outside gives the game data most frequently used, for alien troops of the lowest ranks. The inside back cover gives the details for higher-ranked invaders, with modified Defense Values. Read the Xenoborg section thoroughly (pages 36-39), and review the notes on the other alien races (page 47), so that you can handle the variety of situations that may come up in battle.

But the CC game as a campaign demands much more than simple combat. It is impossible to give all the game details needed for such a campaign, for several reasons. First, this is a new game, and the specific needs have yet to be discovered — though the general ones can be anticipated, and are addressed. Second, this is Set #1 of a series of three (or even more) rule sets; much remains to be covered in subsequent products. And third, this one set is very limited in size; a comprehensive treatment of the subject would be large, and the resulting product would be much more expensive than this one. Given sufficient demand, the game will expand quickly, and eventually everything will be covered.

This rule set demands your creativity. It is a construction kit; assembly is required. The world of 2035, the CYBORG COM-MANDO Force, and the invading aliens are described herein. Most of the information is given in encyclopedic fashion, that being the method of presentation that best organizes the data. You must read and become generally familiar with this material, and then use it to create adventures set within a greater campaign that is all your own. But before that, of course, you should also be familiar with the information and concepts contained in the CCF Manual.

You're not entirely on your own, though. The third booklet in this set describes several adventures that you can develop. These scenarios are outlines, and a good bit of work on your part will be required to prepare them for use. Complete adventures, settings, and accessory detail packs are available as separate products, and these will help you flesh out your initial campaign into a highly detailed

form. Information will be forthcoming on settings, equipment, and adventures.

Style

The emphasis throughout this game is on hard science. The details of the near-future setting have been realistically extrapolated by logical means from the current (1980s) world. With respect to the setting and characters described in this game, *every detail may someday become reality*. With the aliens, however, come two assumptions, both of which may be unrealistic: they have an advanced civilization, and they have a device that makes galactic travel possible. But those assumptions provide the challenge and excitement of the game, and such things are at least possible, even if unlikely.

Fantasy is discouraged herein. Teleportation is fiction, the galaxy is not traveled by thousands of intelligent alien races, and the speed of light is an absolute limit. Earth still hopes to avert nuclear war, struggles to feed its hungry masses, and frantically tries to cope with pollution.

In 2035, the world population is more than 12 billion. This is a critical factor in determining the characteristics and general lifestyle of any place on the globe. A section of this booklet gives ways to update 20th century figures, obtainable from your local library, to fit the game setting.

The World Setting

Although international power in the year 2035 is centralized in the United Earth Government (U.E.G., commonly called the World Court), it is therein balanced and shared by the five large territorial blocs into which the world is divided. Representatives from these blocs sit on the World Councils, thereby controlling the activities of the government.

These five blocs (often called the Five) are the European Commonwealth (essentially historical Europe), the Pan-Asian Union (Asia and the Middle East), the Trans-American Union (North, Central, and South America), United Afrika (the continent plus Madagascar and assorted islands, but stopping at the Suez canal), and the United Nations of Oceania (Australia, New Zealand, Indonesia, Antarctica, and most of the islands of the South Pacific).

The Five were established between 1997 and 2010. At first, they were simply small regulating bodies created for monitoring and smoothing international commerce, including monetary supply. With success came more power and broader scope, until it became apparent that the methods of organization employed by the Five would also suffice for regional government.

For that large step to be taken, however, the autonomy and individualism of each member nation had to be emphasized and assured. Although the people of the world are represented to the World Court by the blocs of which they are members, each separate nation maintains its independence from bloc control, at least with respect to all internal affairs. Each country maintains its own government; the bloc governments regulate international dealings only.

The bloc governments are supported by a minimal tax on all their constituents, based on average incomes and amounting to less per person (per year) than one might spend on a single beverage. When multiplied by the billions of people, however, this provides the bloc governments with ample funds for a variety of activities, including communications and postal systems, monetary systems & trade regulation, education, food and water distribution, international law enforcement, and research programs (both earthbound and otherwise).

Though some of the above may seem to be local affairs, they are less so than regional. A typical blend occurred in Education, specifically with respect to languages. The Five had commissioned the creation of a new international language called Terran, to be used for all international affairs (including world government). A global standard in 2035, the language is a blend of English, Russian, Chinese, Spanish, French, and a smattering of other tongues. Upon its completion, each bloc government made the same offer to its member nations. The bloc government would pay all the costs of basic education for every person, young and old, subject to two conditions:

- (1) Each country would first pick a national language of its own choosing.
- (2) The teaching and regular use of both the national language and the Terran (international) language was required, and a top priority.

From that starting point, the individual nations could teach any topic and in any manner they pleased. Most of the world took advantage of the offer, and illiteracy soon became an unusual (and often medical) problem.

The U.E.G. functions more smoothly and effectively than did any international government of the past, but it is certainly not perfect. The technological wonders of the Century Revolution eased but did not conquer cultural diseases. A separation of classes is present in every nation of every bloc, usually divided along financial lines. But until a better form of government comes along, the U.E.G. will do.

Us and Them

The most important information in this booklet is about the CYBORG COM-MANDO™ Force (CCF) and the Extraterrestrial invaders. Before you tackle the information herein, you should be familiar with the details given in the CCF Manual, which is also included with this set.

The CC Force (CCF)

From 2025 to 2035, the CCF became a global organization. This booklet lists all the CC bases in the world, along with their locations, command structure, and CC staff assigned to each. You will initially use only a small portion of that vast amount of detail — that which pertains to the area in which you begin your campaign — but the rest lays out the guidelines for the future development of your setting. The players may be generally aware of the CCF network, but they should not know the post-invasion status of any given base. That remains to be discovered, and it can be the seed from which many exciting adventures grow.

CC Base Codes

All CC bases are part of a single international network. Many standard CC operations involve multiple nations and political Blocs. The following coding system is used for all base designations.

General Format: Letter A Letter B Number C Letter D . Number E

Letter A = Territorial Bloc:

- E European Commonwealth (E.C.)
- P Pan-Asian Union (P.A.U.)
- T Trans-American Union (T.A.U.)
- A United Africa (U.A.)
- O United Nations of Oceania (U.N.O.)

Letter B = Region of the political bloc. Each alliance is divided into three or

four regions on a geographic basis.

Number C = The nation's numerical designation in a standard alphabetical listing. (See the CCF Manual for a full list of nations as of January 1, 2035.)

Letter D = The type of Base, which describes its function:

- C Command Base
- P Primary Base
- S Secondary Base
- T Tertiary Base
- R Research Base

A combination base always bears the first letter code on the list; for example, a combined Command/Primary base has a "C" code. If a nation has a Command base but no Primary, assume that the base has full Tertiary facilities.

Number E = A two-digit numerical designation of the base, in numerical order within Type within nation. For a Secondary base, the first digit corresponds to the number of its Primary.

Examples: TB 10 C.1= Trans-American Union, Region B (Central), nation #10 (Panama), Command base #1.

OC 02 S.32= Oceania, Region C (South), nation #2 (Australia), Secondary base #2 for Primary base #3.

The Extraterrestrials

These are the bad guys, of course; four alien races are fully detailed. The Xenoborgs supply the bulk of the force that invades the Earth; Powwers and Teleborgs are the Xenoborgs' tools; and the beings of the fourth race, the Masters, are mysterious unseen creatures that have engineered the whole business.

Xenoborgs are very realistic aliens, not the "B-movie monsters" they may seem at first. Part one of the Xenoborg section gives the game details needed for immediate play. Part two is a comprehensive study in Xenobiology; when you're finished with it, you'll understand how the creatures' bodies really work. Part three, Xenoids, looks at Xenoborgs as functioning beings, and includes notes on their culture.

The Extraterrestrials section concludes with details on two more topics. The device used to travel throughout the galaxy and beyond, the Q-drive, is explained in detail; this is what makes the whole game possible. And finally, the invasion of Earth is described in all its horrifying detail, complete with methods of attack, targets, occupation zones, and a post-invasion combat summary.

CHOOSE NOW!

Don't skip this section. Don't stop reading after the first paragraph below, either.

Before you run your first game, you must decide how to measure things. Unlike most games, this one gives you a choice: you may use either the Metric or the English system. We strongly urge you to choose the Metric. If you are an American, you probably won't want to; the Metric system has not been generally accepted in the U.S.A. But before you decide, please wait and consider the facts.

Start with your side of the argument. Metric is a system you're not familiar with. For that reason, you can't "feel" the information; you know instinctively what 100 pounds is like, but how much is 100 kilograms? How far is 100 meters? Better to stick with what you know, right?

But consider: you're learning a whole new game, and you can easily learn the Metric system along with it. And the Metric system is so simple that it will actually make the game easier to play.

For example, to convert a million yards into miles, you'll probably multiply by 3 (to get feet) and then divide by 5,280. Can you do it fast, and in your head? (Answer: 568 miles 320 yards.) On the other hand, you can convert a million meters into kilometers simply by dropping three zeroes. (Answer: 1,000 kilometers.)

In the middle of a game, you won't want to stop the action because you're forced to use a calculator for awkward numbers like 16 (ounces per pound) or 231 (cubic inches per gallon) or 5,280 (feet per mile). If you use Metrics, you're always using nice, simple numbers, and you rarely need a calculator.

Finally, this is a hard-science game, and you'll probably use a lot of scientific information from other sources if you want a realistic campaign. And the scientific community uses the Metric system.

Please give it a try. You'll find that in a very short time, you'll get the "feel" of the units involved — and you'll love how simple it makes things. If (or rather, when) you get resistance from players who want to stay with the same old system no matter how much harder it is, *insist* that they give it a try. Promise that you'll go back to the English system if they really want you to, but only after a few games.

Details on units and conversions for both systems are given on pages 62 and 63. Take a look at them before you make your final choice. Many distances are given without units; in such cases, read the numbers as either meters or yards, depending on which system you have chosen. Weights and measures throughout the game are given in both Metric and English versions, for convenience.

Population

On July 18, 1987, the total population of the world passed the five billion mark. On January 1, 2035, it's more than twelve billion. The Xenoborg invasion, however, quickly and tragically removes over a third of Earth's people.

If you play any CC games set in the pre-invasion period, the populations of the towns and cities in which the characters adventure are very important factors. Population — or more specifically, overpopulation — has a direct effect on the available resources of food, water, and technology. Overpopulation is also a primary cause of war.

Population data is still more critical to the post-invasion game, for it determines, among other things, the amount of attention the Xenoborgs give a particular city or region. The aliens depopulate all urban areas with populations greater than five million during the first hours of the invasion, but they leave less dense areas alone, planning to clean them out with later troop activity. The Xenoborgs may devote an entire platoon to a city, but ignore a small town, though roving squads or individuals inspect such areas occasionally.

Using the charts and formulae given in this section, you can accurately calculate the population of any area, at any time from the present to the date of the invasion itself. You should use a calculator.

Calculating Populations

Start by selecting a city, town, country, continent, or other area for which you have an accurate population figure (Check the reference books at your local library for these data.) As of the publication date of this game, the most accurate and readily available figures are for the 1970 estimate or the 1980 census.

Refer to Table 1 (below), and find the continent (or sub-continental area, for Asia and Oceania) wherein the area you have selected lies. Multiply the population figure that you already have by the growth factor (a decimal number) given on the chart. The result is the population as of January 1, 2035.

Example: You find that the 1980 population of Philadelphia, PA (U.S.A., North America) was 1,688,210. The "1980" line for North America gives a growth factor of 2.45058. Multiplying the two, you find that the 2035 population of Philadelphia is 4,137,093.

Modifying Growth Rates

The growth rates given are extrapolated from current (1980s) estimates. The trend, once thought to be exponential (producing a Malthusian collapse in the relatively near future), is flattening. The

current annual growth rate (near 1.9%) may turn downward, perhaps approaching 1%, or dropping even lower — presuming various methods of general population control, not excluding racial instinct.

Averaged annual growth rates are given on Table 2. The authors of this work presume that you will disagree with some or all of them, and in any event, the passage of time will no doubt reveal errors. You may revise these and other rates as you wish.

Given a population P as of year Y with annual growth rate G (expressed as a decimal), the formula used to find the population N years from Y (P_{Y+N}), is:

$$P_{Y+N} = P(G+1)^N$$

If you use 1980 census information, $N=55$ for the year 2035, which yields the factors on Table 3. To use that data, first select a percentage annual growth rate (G). Express it as a decimal and add 1 (for example, 1.4 % becomes 1.014); the first column of the table gives some help in this step. Find the resulting decimal in the second column ($G+1$), and note the factor for it in the third column, $(G+1)^N$. Multiply the population figure you have selected (from the 1980 census) by that factor to find the resulting 2035 population. To find a factor for a rate not on the chart, use the formula above (but only if your calculator

Population Table 1: Multiplication Factors by Continent & Sub-continental Area

	North America	South America	Europe	Asia ^a		Africa	Oceania ^b	
				Small	Large		Small	Large
1970	2.82829	5.73846	1.65873	2.56694	3.03608	5.63370	3.62285	7.85660
1980	2.45058	4.60304	1.44010	2.13819	2.58159	4.13418	3.14545	6.14545

Population Table 2: Averaged Annual Long-Term Growth Rates (through 2035)

	North America	South America	Europe	Asia ^a		Africa	Oceania ^b	
				Small	Large		Small	Large
1970	1.61235	2.72444	0.78158	1.46090	1.72324	2.69532	2.00014	3.22214
1980	1.64304	2.81474	0.66532	1.39133	1.73933	2.61411	2.10541	3.35639

Notes, Tables 1 & 2:

a. Use Large for mainland, Small for all islands (such as Japan)

b. Use Large for Australia and New Zealand, Small for all islands

can handle exponents; multiplying a number 55 times can be tedious).

If you wish to extrapolate more accurately, fiddle with Table 4, which gives the averaged annual rates from 1920 onwards and shows the trends more clearly. The first three columns are historically

accurate; the others are extrapolated, including various future-historical events in the timeline leading to this game setting. The populations resulting from the rates in Table 4 are summarized in Table 5; these can be helpful guides for games set in such in-between years.

This seems pretty silly, so you decide that since the town is in a rural area, it has half the average growth rate of the continent. The revised annual growth is thus about 0.8 %; $G+1 = 1.008$, the factor is 1.54999, and the 2035 population is 7,978. That's more like it.

On a larger scale, you decide that Africa (1980 pop. 482,400,000) would grow a bit faster than its given 2.614 %; with all that water from Antarctica, and the new agricultural technology, maybe it should be raised just a bit, to 2 3/4 %. The revised $G+1$ is 1.0275, so the factor is 4.44632, and the result is 2,144,904,768. With that tiny increase (less than fourteen hundredths of a percent) in the annual growth rate, you've just added over 150 million people!

Population Table 3

Other Growth Rates (N=55)

Annual rate	G+1	(G+1) ^N
1/10 %	1.001	1.05651
	1.002	1.11616
1/4 %	1.0025	1.14720
	1.003	1.17910
1/3 %	1.0033+	1.20085
	1.004	1.24553
1/2 %	1.005	1.31563
	1.006	1.38960
2/3 %	1.0066+	1.44116
	1.007	1.46764
3/4 %	1.0075	1.50827
	1.008	1.54999
	1.009	1.63687
1 %	1.010	1.72852
	1.011	1.82521
	1.012	1.92721
1 1/4 %	1.0125	1.98028
	1.013	2.03790
1 1/3 %	1.0133+	2.07194
	1.014	2.14826
1 1/2 %	1.015	2.26794
	1.016	2.39416
1 2/3 %	1.0166+	2.48212
	1.017	2.52727
1 3/4 %	1.0175	2.59653
	1.018	2.66764
	1.019	2.81566
2 %	1.020	2.97173
2 1/4 %	1.0225	3.40003
2 1/3 %	1.0233+	3.55584
2 1/2 %	1.025	3.88877
2 2/3 %	1.0266+	4.25227
2 3/4 %	1.0275	4.44632
3 %	1.030	5.08215
3 1/4 %	1.0325	5.80702
3 1/3 %	1.0333+	6.07050
3 1/2 %	1.035	6.63314
3 2/3 %	1.0366+	7.24690
3 3/4 %	1.0375	7.57436
4 %	1.040	8.64637
	1.0425	9.86696
4 1/2 %	1.045	11.25631
	1.0475	12.83724
5 %	1.05	14.63563
	1.06	24.65032
	1.07	41.31500
7 1/2 %	1.075	53.39069
	1.08	68.91386
	1.09	114.40826
10 %	1.10	189.05914

Examples

You find that the 1980 population of Lake Geneva, Wisconsin (USA, North America) was 5,147. Instead of using the given 1.64304 annual growth rate, you want to increase it to 10%, just to see what would happen. $G+1$ is thus 1.10, and $(G+1)^N = 189.05914$; the 2035 population of Lake Geneva is therefore 970,088.

Population Table 4

Averaged Annual Growth Rates in Short Terms

	1920- 1950	1960- 1970	1971- 1980	1981- 1990	1991- 2000	2001- 2010	2011- 2020	2021- 2030	2031- 2035
N. America	1.63	1.7	2.4	2.1	1.9	1.7	1.5	1.4	1.3
S. America	2.2	3.2	4.0	4.5	4.1	a	3.1	2.8	2.2
Europe	0.57	0.75	0.83	0.9	0.8	0.7	0.6	0.5	0.5
Asia	1.4	2.2	2.9	2.1	b	2.2	2.9	2.5	1.9
Africa	1.4	6.0	4.8	1.5	c	2.8	3.5	4.1	4.4
Oceania	1.33	2.9	2.6	3.0	3.8	3.4	2.9	3.2	3.7

a, b, c: See below

Problem	Period	Rate	Period	Rate
a South American War	2000-2004	2.5	2005-2009	- 1.8
b Asian Plague	1991-1995	- 3.1	1996-2000	1.5
c African Plague	1991-1995	0.3	1996-2000	1.9

Population Table 5

Numbers per continent (in millions of people; based on the rates in Table 4)

	Americas		Europe	Asia	Africa	Oceania	World
	North	South					
1970	327.0	195.0	577.0	2238	354.0	19.8	3,706
1980	377.4	243.1	664.6	2632	482.4	37.6	4,422
1990	455.0	361.3	720.4	3173	551.6	49.1	5,310
2000	549.3	339.9	780.2	2920	615.1	71.2	5,276
2010	650.1	561.1	836.5	3630	810.8	99.5	6,588
2020	754.5	761.4	889.1	4831	1075.9	132.5	8,444
2030	867.0	1003.6	933.5	6184	1608.0	181.5	10,778
2035	924.85	1119.00	957.09	6794.74	1994.33	217.64	12,007.65



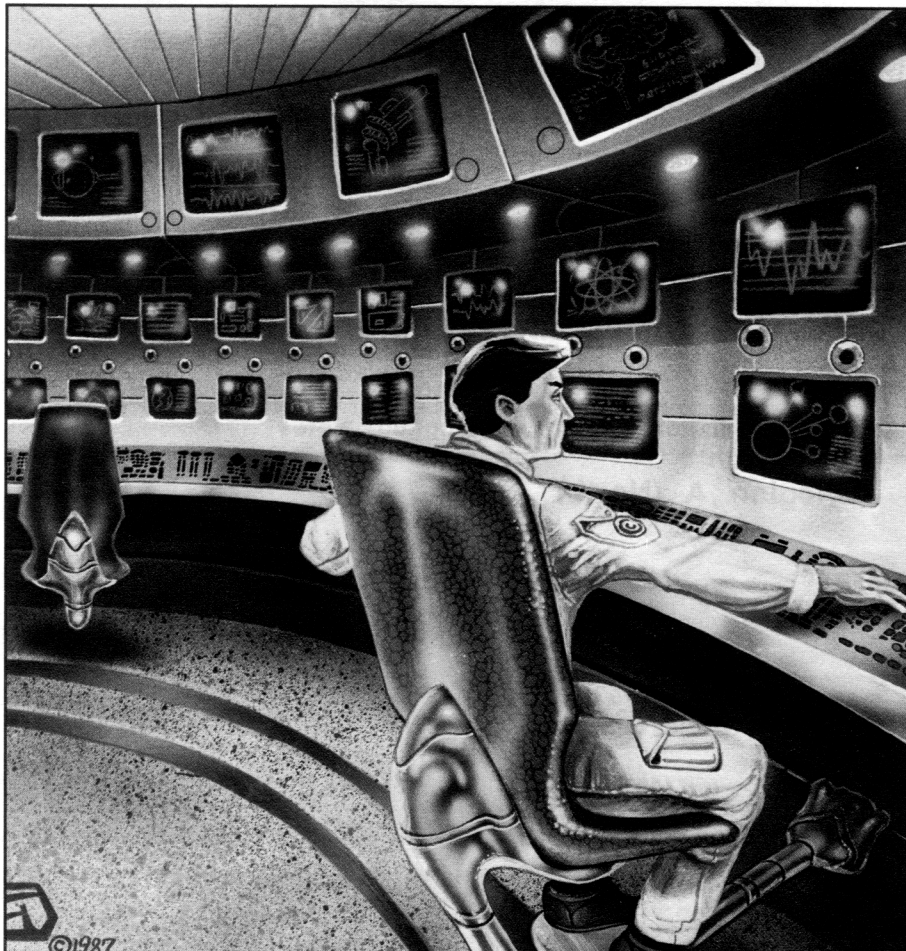
European Commonwealth

The prosperous E.C. leads the world in per capita income. Though third in total wealth, it places a mere fourth in population, having enjoyed a minimal growth rate for decades. The Commonwealth is the smallest of the five blocs in land area, and places third in food production — maintaining more than enough output to support a thriving export business. Though the E.C. has a high level of technology, it cannot afford to seriously compete with the T.A.U. and P.A.U. in pioneering this field. The Commonwealth thus concentrates on maintaining its reputation for high quality, rather than quantity.

Bruxelles, Belgium, was selected as the capital of the Commonwealth. The E.C. is divided into three regions on a roughly geographical basis. The Atlantic group is called the North region, though it includes some islands at latitudes as far south as Portugal. In this region, the U.K.

CC Base Staffing

Base	Metro area	Initial CC Staffing		CC Losses in Invasion		New CC Staffing	
		T-1	T-2	T-1	T-2	T-1	T-2
EA 05 P.1	Oslo	4	1	2	0	2	1
EA 09 P.1	Liverpool	5	1	3	0	2	1
EB 08 P.1	Amsterdam	4	1	3	0	1	1
EC 03 P.1	Athínai	3	1	2	0	1	1
EC 04 P.1	Barcelona	4	1	4	0	0	1
EC 06 P.1	Napoli	4	1	2	0	2	1
EC 11 P.1	<i>Stambul</i>	<u>4</u>	<u>1</u>	<u>4</u>	<u>1</u>	<u>0</u>	<u>0</u>
		28	7	20	1	8	6



and the Scandinavian countries compete for dominance. The former emphasizes industry; the latter, research & development. In the Central region, France has the loudest voice, but its chaotic habits seem to prevent it from acquiring a wide following. The greatest riches of the Commonwealth rest, as always, in the coffers of Suisse (the alliance of Switzerland and Liechtenstein). In the South region (the Mediterranean nations), Spain became an industrial leader between 2015-2025. This region grew when Türkiye and Bâlgarija, nations long considered part of western Asia, joined the Commonwealth as a means of ensuring their safety from the ever-expanding Soviet. They were welcomed, and now contribute much toward the E.C.'s agricultural assets.

The nations of the continent still maintain their Old World charm, blending ancient and modern cultures into a pleasing whole. Despite the many changes of the 21st century, classic Europe survives. Overpopulation is not a problem; the North is still growing, but the rest of the population is fairly stable. Called stodgy and archaic by some, the Commonwealth merely considers itself traditional.

In the key that starts on the next page, bases are listed in order under the nations to which they report. CC bases in italicized cities were lost during the depopulation of those metro areas. Specific details on CC losses are given as footnotes, as are additional details on the locations.

CC Command Structure

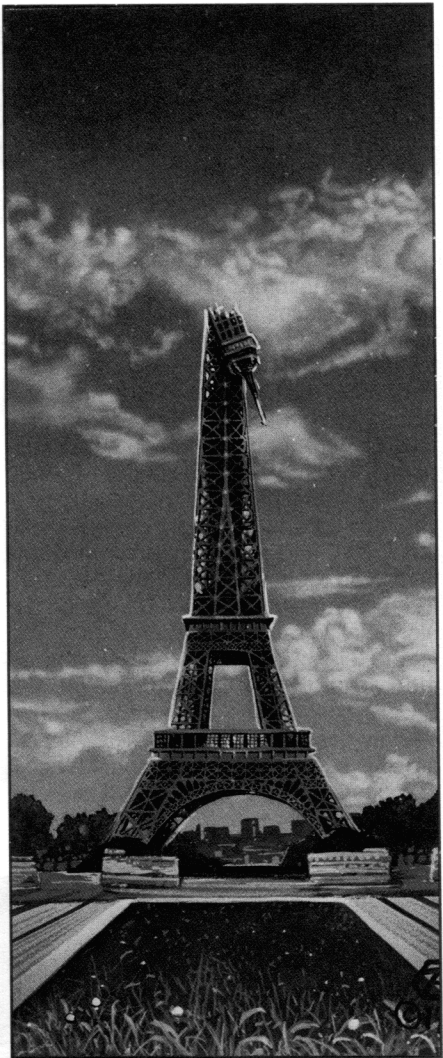
National, International, and Sector HQ are listed under the Regional command bases to which they report. Primary bases are listed under the appropriate local commands. All secondary, tertiary, and research bases technically report directly to the local HQ, though Secondaries often report directly to the corresponding Primary base in practice. Bases destroyed in the invasion are marked with an asterisk. See the individual base listings in the Key to CC Bases, below, for details on replacement bases and CC losses.

Supreme High Command: Zürich, Suisse (EB 10 C.2)

- * **Region A (North) Command:** London, England, U.K. (EA 09 C.3)
 - Norge National HQ: Oslo, Akershus (EA 05 C.1)
 - Primary: Oslo
 - United Kingdom National HQ: Birmingham, England, U.K. (EA 09 C.2)
 - Primary: Liverpool, England, U.K. (EA 09 P.1)
 - Other National HQ: Nykøbing, Danmark; Baile Atha Cliath, Eire; Reykjavík, Island, North Atlantic States; Helsingfors, Suomi; Stockholm, Sverige.

- Region B (Central) Command:** Praha, Ceskoslovensko (EB 03 C.1)
 - Nederland National HQ: 's Gravenhage (The Hague), Zuid-Holland (EB 08 C.1)
 - Primary: Amsterdam, Noord-Holland (EB 08 P.1)
 - Other National HQ: Antwerpen, België; Konstanz, Bundesrepublik Deutschland; Kosice, Ceskoslovensko; *Paris, France; Berne, Suisse.

- * **Region C (South) Command:** Roma, Italia (EC 06 C.1)
 - Ellás National HQ: Athínai, Attik (EC 03 C.1)
 - Primary: Athínai
 - * España National HQ: Madrid, New Castille (EC 04 C.1)
 - * Primary: Barcelona, Cataluña (EC 04 P.1)
 - Italia National HQ: Salerno, Salerno (EC 06 C.2)
 - Primary: Napoli, Latina (EC 06 P.1)
 - Türkiye National HQ: Ankara, Galatia (EC 11 C.1)
 - * Primary: Stambul, Istanbul (EC 11 P.1)
 - Other National HQ: Dubrovnik, Jugoslavija; Kirinia, Kípros; Setúbal, Portugal; Durrës, Shqipëri; Palma de Mallorca, Tyrrhenia.



Key to CC Bases of the European Commonwealth

Base	Territory	Metro	Area	Population	Latitude	Longitude	Notes
Region A (North)							
Nation # 1: Azores & Madeira Islands							
No bases							
Nation # 2: Channel Islands							
No bases							
Nation # 3: Danmark							
EA 03 C.1	Storstrøm	Nykøbing ^a		40,985	54.47° N	11.53° E	Danmark National HQ

a. On the island of Falster, not Nykbing in Viborg (58.48° N, 08.52° E, or Vestjælland (55.56° N, 11.41° E).

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
Nation # 4: Eire (Ireland)						
EA 04 C.1	Dublin	Baile Atha Cliath ^a	1,542,155	53.20° N	06.15° W	Eire National HQ
EA 04 T.01	Galway	Gallimh (Galway)	51,160	53.16° N	09.03° W	Reports to EA 04 C.1
Nation #5: Norge (Kingdom of Norway)						
EA 05 C.1	Akershus	Oslo	1,007,300	59.56° N	10.45° E	Norge National HQ & Primary
EA 05 S.11	Rogaland	Skjold	12,500	59.30° N	05.36° E	Oslo Secondary
EA 05 S.12	Østfold	Fredrikstad	66,685	59.15° N	10.55° E	Oslo Secondary
EA 05 S.13	Vestfold	Larvik	22,925	59.04° N	10.02° E	Oslo Secondary
EA 05 S.14	Göteborg (Sverige)	Uddevalla	7,890	58.20° N	11.56° E	Oslo Secondary
Nation # 6: North Atlantic States						
EA 06 C.1	Island	Reykjavík	166,840	64.09° N	21.58° W	North Atlantic Sts. National HQ
EA 06 R.1	Faeroe	Tórshavn	4,975	62.02° N	06.47° W	
Nation # 7: Suomi (Finland)						
EA 07 C.1	Uusima	Helsingfors (Helsinki)	1,229,560	60.08° N	24.10° E	Suomi National HQ
EA 07 T.01	Lappi	Tornio	27,615	65.52° N	24.10° E	
Nation # 8: Sverige (Sweden)						
EA 08 C.1	Stockholm	Stockholm ^b	1,923,265	59.20° N	18.05° E	Sverige National HQ
Nation #9: United Kingdom of Great Britain (England, Scotland, Wales, Isle of Man)						
EA 09 C.1	Lothian	Edinburgh	882,225	55.57° N	03.13° W	Kingdom of Scotland
EA 09 C.2	West Midlands	Birmingham	3,695,615	52.30° N	01.50° W	United Kingdom National HQ
EA 09 C.3	London	London ^c	15,352,100	51.30° N	00.10° W	Regional HQ, E.C. North
EA 09 P.1	Merseyside	Liverpool	2,132,600	53.25° N	02.55° W	Kingdom of England
EA 09 S.11	Strathclyde	Ayr	134,765	55.28° N	04.38° W	Kingdom of Scotland
EA 09 S.12	Cleveland	Hartlepool	132,125	54.41° N	01.13° W	Kingdom of England
EA 09 S.13	Lincolnshire	Skegness	53,836	53.10° N	00.21° E	Kingdom of England
EA 09 S.14	Gwynedd	Caernarfon	12,280	53.08° N	04.16° W	Kingdom of Wales

Region B (Central)

Nation # 1: België (Belgium)

EB 01 C.1	Antwerpen	Antwerpen	2,132,915	51.13° N	04.25° E	België National HQ
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Nation # 2: Bundesrepublik Deutschland (West Germany)

EB 02 C.1	Württemberg	Konstanz (Constance)	94,400	47.40° N	09.10° E	BRD National HQ
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Nation # 3: Československo (Czechoslovakia)

EB 03 C.1		Praha	1,771,400	50.06° N	14.26° E	Regional HQ, E.C. Central
EB 03 C.2	Slovensko	Kosice	279,175	48.44° N	21.15° E	Československo National HQ

Nation # 4: Deutsche Demokratische Republik (East Germany)

No bases

a. Dublin

b. Also a major research facility.

c. New Regional HQ: Stockholm, Sverige (EA 08 C.1).

E.C. Bases: Region B (Central), France

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
Nation # 5: France						
EB 05 C.1	Paris	Paris ^a	13,129,170	48.52° N	02.20° E	France National HQ
EB 05 C.2	Monaco	Monte Carlo	69,470	43.44° N	07.25° E	
EB 05 T.01	Finistere	Brest	265,100	48.23° N	04.30° W	
EB 05 T.02	Charente-Maritime	La Rochelle	139,835	46.10° N	01.10° W	
EB 05 T.03	Provence	Toulon	525,765	43.07° N	05.55° E	Replaces EB 05 C.1 as Natl. HQ

Nation # 6: Luxembourg

No bases

Nation # 7: Magyarország (Hungary)

No bases

Nation #8: Nederland (Kingdom of the Netherlands, aka Holland)

EB 08 C.1	Zuid-Holland	's Gravenhage ^b	1,076,730	52.05° N	04.16° E	Nederland National HQ
EB 08 P.1	Noord-Holland	Amsterdam	2,514,700	52.21° N	04.54° E	Primary base
EB 08 S.11	Groningen	Delfzijl	35,335	53.19° N	06.26° E	Amsterdam Secondary
EB 08 S.12	Friesland	Harlingen	21,430	53.10° N	05.25° E	Amsterdam Secondary
EB 08 S.13	W. Vlaanderen (België)	Oostende	25,005	51.13° N	02.55° E	Amsterdam Secondary
EB 08 S.14	Normandie (France)	LeHavre	367,360	49.30° N	00.06° E	Amsterdam Secondary

Nation # 9: Österreich (Austria)

No bases

Nation # 10: Suisse (Switzerland and Liechtenstein)

EB 10 C.1	Bern	Berne	392,350	47.57° N	07.26° E	Suisse National HQ
EB 10 C.2	Zürich	Zürich	1,083,675	47.23° N	08.33° E	Supreme High Command, E.C.

Region C (South)**Nation # 1: България (Bulgaria)**

No bases, but Turkiye Secondary Base is located here.

Nation # 2: Città del Vaticano (Vatican City)

No bases

Nation #3: Ελλάς (Hellenic Republic, aka Greece)

EC 03 C.1	Attik	Athínai (Athens)	3,528,900	38.00° N	23.44° E	Ellás National HQ & Primary
EC 03 S.11	Thessalia	Vólos	122,390	39.22° N	22.57° E	
EC 03 S.12	Ipiros	Préveza	11,275	38.58° N	20.45° E	
EC 03 S.13	Pelopónnisos	Pátrai (Patras)	167,890	38.14° N	21.44° E	
EC 03 S.14	Pelopónnisos	Návplion	7,715	37.34° N	22.48° E	

Nation #4: España (Spanish State)

EC 04 C.1	New Castille	Madrid	7,016,890	40.25° N	03.43° W	España National HQ
EC 04 P.1	Cataluña	Barcelona ^c	5,522,500	41.25° N	02.10° E	

a. National HQ in Paris was lost in the depopulation of that area. New HQ: Toulon (EB 05 T.03).

b. The Hague.

c. All Type-1 CC operatives in Barcelona were lost in the depopulation of that area, but the Type-2 survived. New HQ: Cadiz (EC 04 T.03).

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
EC 04 R.1	Cantabria	Santander	245,025	43.28° N	03.48° W	
EC 04 S.11	Roussillon (France)	Canet-Plage	10,500	42.42° N	03.02° E	Barcelona Secondary
EC 04 S.12	Girona	Palamós	13,350	41.51° N	03.07° E	Barcelona Secondary
EC 04 S.13	Tarragona	Tarragona	152,780	41.07° N	01.15° E	Replaces EC 04 P.1
EC 04 S.14	Castellón	Vinaroz	18,695	40.29° N	00.28° E	Barcelona Secondary
EC 04 T.01	La Coruña	La Coruña	317,650	43.22° N	08.24° W	
EC 04 T.02	Valencia	Cullera	12,335	39.10° N	00.15° W	
EC 04 T.03	Cadiz	Cadiz	319,545	36.32° N	06.18° W	Replaces EC 04 C.1 as Natl. HQ

Nation # 5: Gibraltar

No bases

Nation #6: Italia (Italian Republic)

EC 06 C.1	Roma	<i>Roma^a</i>	4,838,900	41.53° N	12.30° E	Regional HQ, E.C. South
EC 06 C.2	Salerno	Salerno	333,430	40.40° N	14.46° E	Italia National HQ
EC 06 P.1	Latina	Napoli (Naples) ^b	3,806,700	40.50° N	14.15° E	Napoli Primary
EC 06 S.11	Campobasso	Termoli	28,350	42.00° N	15.00° E	Napoli Secondary
EC 06 S.12	Latina	Anzio	37,820	41.27° N	12.38° E	Napoli Secondary
EC 06 S.13	Latina	Gaeta	33,950	41.13° N	13.36° E	Napoli Secondary
EC 06 S.14	Salerno	Agropoli	24,845	40.21° N	14.59° E	Napoli Secondary
EC 06 T.01	Giulia	Trieste	361,630	45.39° N	13.47° E	
EC 06 T.02	Sicilia	Siracusa (Syracuse)	162,210	37.04° N	15.18° E	

Nation # 7: Jugoslavija (Yugoslavia)

EC 07 C.1	–	Dubrovnik (Ragusa)	43,215	42.40° N	18.07° E	Jugoslavija National HQ
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Nation # 8: Kípros (Cyprus)

EC 08 C.1	–	Kirinia	5,420	35.20° N	33.20° E	Kípros National HQ
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Nation # 9: Portugal

EC 09 C.1		Setúbal	70,480	38.31° N	08.54° W	Portugal National HQ
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Nation # 10: Shqipëri (Albania)

EC 10 C.1	–	Durrës	84,750	41.18° N	19.28° E	Shqipëri National HQ
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Nation #11: Türkiye (Republic of Turkey)

EC 11 C.1	Galatia	Ankara	3,181,565	39.55° N	32.50° E	Türkiye National HQ
EC 11 P.1	Istanbul	<i>Stambul^c</i>	9,002,600	41.01° N	28.55° E	New Primary: EC 11 S.14
EC 11 S.11	–	Burgas (Bâlgarija)	231,935	42.30° N	27.29° E	Stambul Secondary Base
EC 11 S.12	Paphlagonia	Zonguldak	270,915	41.26° N	31.47° E	Stambul Secondary Base
EC 11 S.13	–	Tekirdag (Rodosto)	71,310	40.59° N	27.31° E	Stambul Secondary Base
EC 11 S.14	–	Izmir (Smyrna)	1,653,265	38.25° N	27.10° E	Stambul Secondary Base
EC 11 T.01	Van Gölü	Tatvan	56,023	38.31° N	42.15° E	

Nation # 12: Tyrrhenia

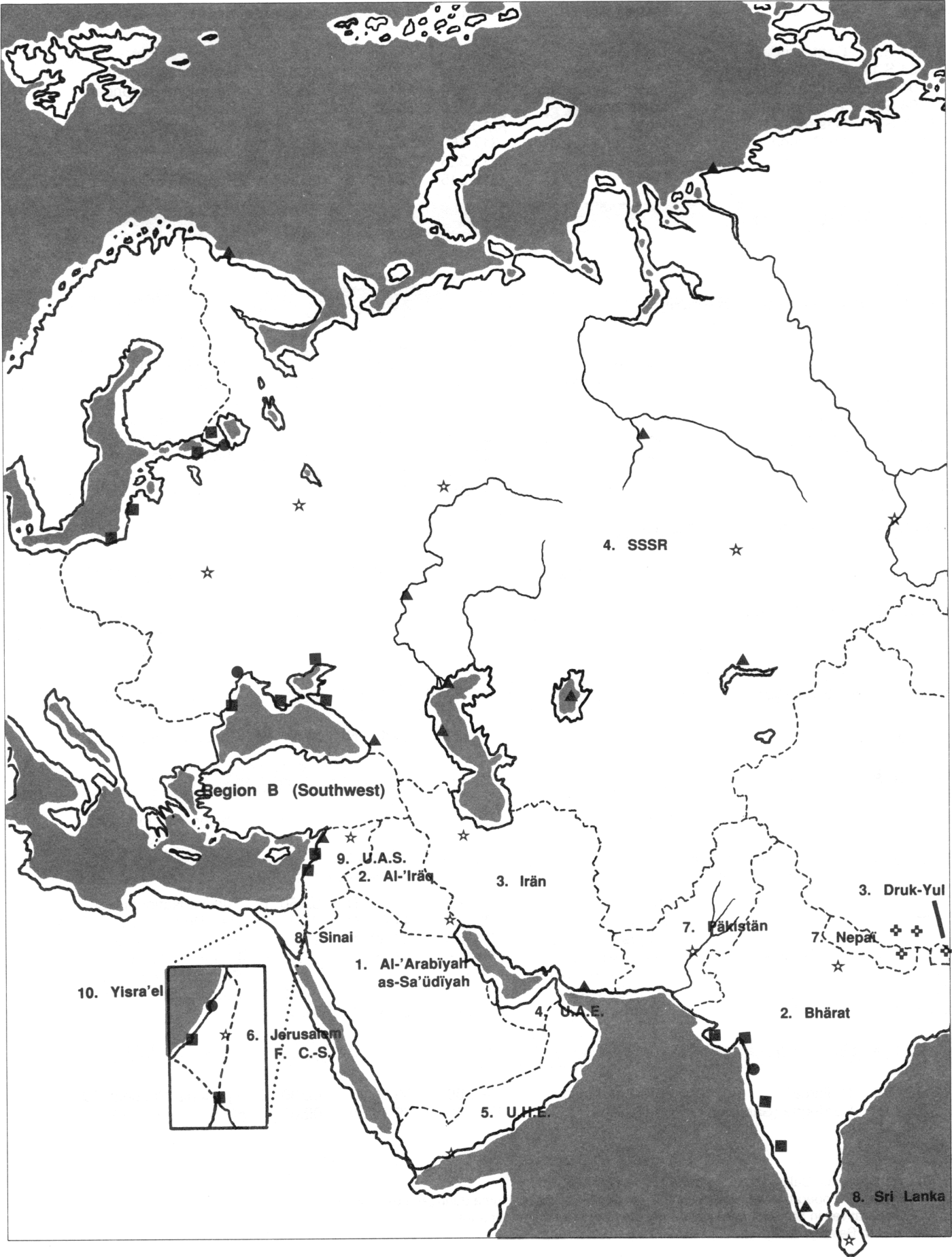
EC 12 C.1	Mallorca ^d	Palma de Mallorca	399,280	39.35° N	02.39° E	Tyrrhenia National HQ
EC 12 T.01	Sardegna (Sardinia)	Cagliari	423,745	39.13° N	09.08° E	

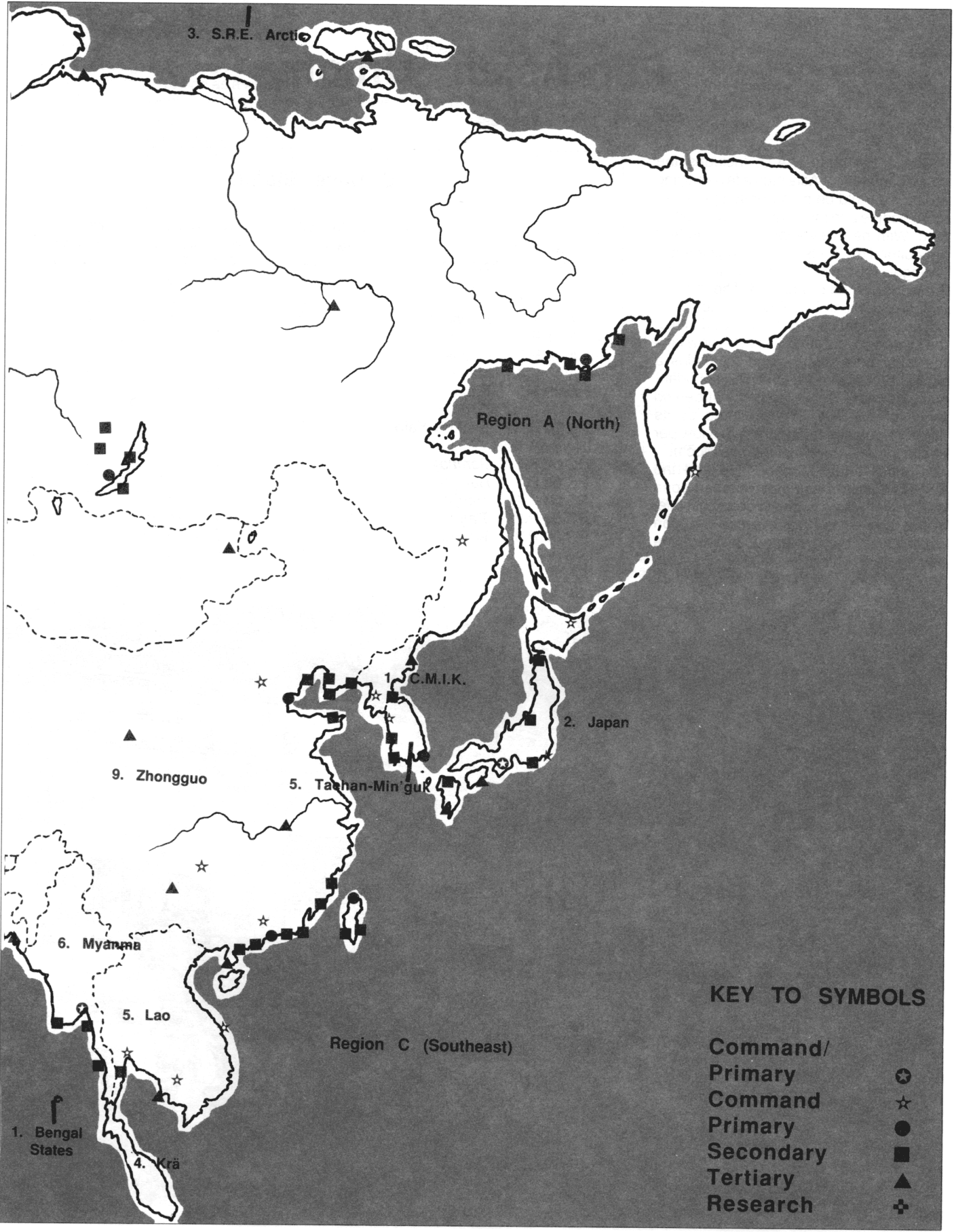
a. New Regional HQ: Caligari, Sardegna, Tyrrhenia (EC 12 T.01).

b. One Type-1 CC operative was lost in combat, and one was lost in Roma during the depopulation of that area.

c. All CC operatives in Stambul were lost during the depopulation of that area.

d. Majorca, on Balearic Island





Pan-Asian Union

Since the huge P.A.U. includes the entire continent of Asia plus a few outlying areas, it should be no surprise that it has more people and more land than any other bloc. With new developments in modern agricultural methods, mostly originating in Zhongguo (China), the P.A.U. also leads the world in food production. The technological expertise of the Orient, which once not only caught up to but exceeded that of the United States (in the T.A.U.), now lags the latter only slightly, and maintains a steady pressure. The Union's vast financial resources, again lagging just behind those of the T.A.U., are diluted by its massive population, resulting in a low per capita income (fourth in the five blocs).

Conflict between Zhongguo and the SSSR (Russia) has never reached open warfare — such is hoped to be impossible, in this age — but it prevented a Union capital from being named. Instead, the government functions in a “temporary” headquarters in New Delhi, Bhārat (India).

CC Base Staffing							
Base	Metro area	Initial CC Staffing		CC Losses in Invasion		New CC Staffing	
		T-1	T-2	T-1	T-2	T-1	T-2
PA 02 P.1	<i>Osaka</i>	5	2	5	2	0	0
PA 04 P.1	<i>Leningrad</i>	4	2	4	2	0	0
PA 04 P.2	<i>Odessa</i>	5	1	3	0	2	1
PA 04 P.3	<i>Irkutsk</i>	5	1	4	0	1	1
PA 04 P.4	<i>Magadan</i>	5	1	2	0	3	1
PA 05 P.1	<i>Pusan</i>	4	0	4	0	0	0
PB 10 P.1	<i>Tel Aviv-Yafo</i>	3	0	2	0	1	0
PC 02 P.1	<i>Bombay</i>	3	0	3	0	0	0
PC 06 P.1	<i>Rangoon</i>	2	0	0	0	2	0
PC 09 P.1	<i>Tianjin</i>	2	1	2	1	0	0
PC 09 P.2	<i>T'aipei</i>	2	0	0	0	2	0
PC 09 P.3	<i>Victoria</i>	1	1	0	0	1	1
		41	9	29	5	12	4



The P.A.U. is divided into three regions by means which are primarily cultural. The North is of course dominated by the SSSR, though Japan is the jewel of the region, producing technological breakthroughs for which the region as a whole is credited. The Southwest spans the range from Sinai to Pākistān, and consists mostly of Moslems and Hindus. When Yisra'el (Israel, once bolstered by its strong connection with America) found itself amidst and ignored by the political powers of the new P.A.U., control of this region shifted to Al-'Arabīyah as-Sa'ūdīyah (Saudi Arabia), that being the only "oil state" able to avoid the petty squabbles that have always plagued that area. The Southeast is utterly dominated by Zhongguo, despite the inclusion of the powerful Bhārat in this region.

Technological developments in Japan far exceed those of any other P.A.U. nation. Fresh water from Antarctica (U.N.O.) has alleviated most of the southwest's formerly chronic dryness, and a related technology is making breakthroughs in settling the Himalayas and utilizing their natural assets. Major research programs in Druk-Yul (Bhutan) and Nepāi (Nepal) have been quite productive.

More than a third of the world's people live in Zhongguo and Bhārat, and these nations thus add heavy loads to the Union's burdens. The Union as a whole accounts for more than half the Earth. The growth curve is dropping, however, thanks in part to harsh enforcement of the Union's one-child rule. For the P.A.U., the future is bright.

In the key hereafter, bases are listed in order under the nations to which they report. In the staffing chart (previous page) and in the following listing, CC bases in the italicized cities were lost during the depopulation of those metro areas. See notes on the individual bases for details of CC losses.

CC Command Structure

National, International, and Sector HQ are listed under the Regional command bases to which they report. Primary bases are listed under the appropriate local commands. All secondary, tertiary, and research bases technically report directly to the local HQ. Bases destroyed in the invasion are marked with an asterisk. See the individual CC base listings in the Key to CC Bases for details on replacement bases.

* Supreme High Command:

Tōkyō, Honshū, Japan (PA 02 C.2)

* Region A (North) Command: Moskva, Russiya, SSSR (PA 04 C.1)

* Japan National HQ: Ōsaka, Honshū, PA 02 C.1)

* Primary: Ōsaka

SSSR Sector 1 (West) HQ: Minsk, Byelorussia (PA 04 C.2)

* Primary: Leningrad, Leningradskaya Oblast' (PA 04 P.1)

Primary: Odessa, Ukraina (PA 04 P.2)

SSSR Sector 2 (Central) HQ: Krasnoyarsk, Tomskaya Oblast' (PA 04 C.4)

Primary: Irkutsk, Irkutskaya Oblast' (PA 04 P.3)

SSSR Sector 3 (East) HQ: Petropavlovsk-Kamchatskiy, Kam'skaya Ob. (PA 04 C.6)

Primary: Magadan, Magadan (PA 04 P.4)

* Taehan-Min'guk National HQ: Sōul (PA 05 C.1)

* Primary: Pusan (PA 05 P.1)

Command HQ, Socialist Republic of the Eastern Arctic: Moskva (PA 04 C.1)

Other National HQ: P'yongyang, Chosōn Minjujuūi In'min Konghwaguk.

Region B (Southwest) Command: Jerusalem Free City-State (PB 06 C.1)

Yisra'el National HQ: Tel Aviv-Yafo (PB 10 C.1)

* Primary: Tel Aviv-Yafo

Other National HQ: Jidda, Al-'Arabīyah as-Sa'ūdīyah; Al-Basrah, Al-'Irāq; Bandar e-Torkeman, Irān; Aden, Ittihad al-Imārāt al-'Hadramawt; Sukkur, Pākistān; Al Lādhīqiyah, United Arab States.

* Region C (Southeast) Command: Guangzhou, Guandong, Zhongguo (PC 09 C.2)

Bhārat National HQ: Kānpur, Uttar Pradesh (PC 02 C.1)

* Primary: Bombay, Mahārāshtra (PC 02 P.1)

* Myanma National HQ: Rangoon, Pegu (PC 06 C.1)

* Primary: Rangoon

* Zhongguo Sector 1 (West) & Sector 2 (Northeast) HQ: Beijing (PC 09 C.1)

* Primary: Tianjin (PC 09 P.1)

* Zhongguo Sector 3 (Southeast) HQ: Chongqing, Sichuan (PC 09 C.3)

* Primary: T'aipei, T'aiwan (PC 09 P.2)

* Primary: Victoria, Hong Kong (PC 09 P.3)

Command HQ, Druk-Yul and Nepāi: Kānpur, Bhārat.

Other National HQ: * Krung Thep, Lao; Colombo, Sri Lanka.

Key to CC Bases in the Pan-Asian Union

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
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Region A (North)

Nation # 1: Chosōn Minjujuūi In'min Konghwaguk (North Korea)

PA 01 C.1	—	P'yongyang	1,995,675	39.00° N	129.55° E	C.M.I.K. National HQ
PA 01 T.01	—	Ch'ōngjin	629,590	41.50° N	129.55° E	

P.A.U. Bases: Region A (North), Japan

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
Nation #2: Japan						
PA 02 C.1	Honshū	Ōsaka ^a	18,056,000	34.40° N	135.30° E	Japan National HQ & Primary
PA 02 C.2	Honshū	Tōkyō ^b	30,647,700	35.40° N	139.45° E	Supreme High Command
PA 02 C.3	Hokkaidō	Abashiri	93,705	44.02° N	144.17° E	Replaces PA 02 C.1 as Natl. HQ
PA 02 S.11	Hokkaidō	Hakodate	684,545	41.46° N	140.44° E	Ōsaka Secondary
PA 02 S.12	Honshū	Niigata	978,830	37.58° N	139.02° E	Ōsaka Secondary
PA 02 S.13	Honshū	Shizuoka	1,571,577	34.59° N	138.24° E	Replaces PA 02 C.1 as Primary
PA 02 S.14	Kyūshū	Moji	26,730	33.57° N	130.58° E	Ōsaka Secondary
PA 02 T.01	Shikoku	Tokushima	533,140	34.03° N	134.34° E	
PA 02 T.02	Kyūshū	Kagoshima	1,079,950	31.37° N	130.32° E	Replaces PA 02 C.2 as SHC

Nation # 3: Socialist Republic of the Eastern Arctic

PA 03 R.1	—	(mobile) ^c	35	85-90° N	1-179° E	Reports to Moskva (PA 04 C.1)
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Nation #4: SSSR (Sojuz Sovyetskikh Socialisticheskikh Respublik, aka Union of Soviet Socialist Republics, USSR)

PA 04 C.1	Moskva Oblast'	Moskva ^d	28,390,300	55.45° N	37.42° E	Regional HQ, P.A.U. North
PA 04 C.2	Byelorussia ^e	Minsk'	3,159,760	53.51° N	27.30° E	HQ, SSSR Sector 1 HQ (West)
PA 04 C.3	Mariskaya Oblast'	Kazan'	2,494,545	55.45° N	49.10° E	
PA 04 C.4	Tomskaya Oblast'	Krasnoyarsk ^g	1,917,235	56.05° N	92.46° E	HQ, SSSR Sector 2 (Central)
PA 04 C.5	Omskaya Oblast'	Omsk	2,470,790	55.00° N	73.22° E	
PA 04 C.6	Kamchatskaya Oblast'	Petropavlovsk-K. ^h	520,290	53.03° N	158.43° E	HQ, SSSR Sector 3 (East)
PA 04 C.7	Amurskaya' Oblast'	Khabarovsk	1,278,160	48.32° N	135.08° N	
PA 04 P.1	Leningradskaya Oblast'	Leningrad ⁱ	12,734,200	59.55° N	30.25° E	New Primary: PA 04 S.12
PA 04 P.2	Ukraina	Odessa	2,660,900	46.30° N	30.46° E	
PA 04 P.3	Irkutskaya Oblast'	Irkutsk	1,332,800	52.18° N	104.15° E	
PA 04 P.4	Magadan	Magadan ^k	296,900	59.38° N	150.50° E	
PA 04 S.11	Karel'skaya Oblast'	Vyborg	182,935	60.45° N	28.41° E	Leningrad Secondary
PA 04 S.12	Estonia	Kohtla-Järve	173,430	59.28° N	27.20° E	Replaces PA 04 P.1
PA 04 S.13	Latvia	Klaipēda (Memel)	422,885	55.43° N	21.07° E	Leningrad Secondary
PA 04 S.14	Polsha ^l	Gdąnsk (Danzig)	1,948,160	54.22° N	18.41° E	Leningrad Secondary
PA 04 S.21	Ukraina	Zhdanov	1,204,510	47.05° N	37.34° E	Odessa Secondary
PA 04 S.22	Ukraina	Novorossiysk	384,870	44.44° N	37.46° E	Odessa Secondary
PA 04 S.23	Ukraina	Sevastopol'	731,735	44.36° N	33.31° E	Odessa Secondary
PA 04 S.24	Rumânia	Constanta	716,915	44.12° N	28.40° E	Odessa Secondary
PA 04 S.31	Irkutskaya Oblast'	Romanova	105,140	57.02° N	103.25° E	Irkutsk Secondary
PA 04 S.32	Irkutskaya Oblast'	Bratsk	520,290	56.20° N	101.50° E	Irkutsk Secondary
PA 04 S.33	Irkutskaya Oblast'	Yelantsy	81,560	52.50° N	106.30° E	Irkutsk Secondary
PA 04 S.34	Irkutskaya Oblast'	Slyudyanka	66,980	51.40° N	103.40° E	Irkutsk Secondary
PA 04 S.41	Magadan	Viliga-Kushka	55,390	61.35° N	156.55° E	Magadan Secondary
PA 04 S.42	Magadan	Tauysk	83,150	59.45° N	149.16° E	Magadan Secondary
PA 04 S.43	Magadan	Ola	38,635	59.35° N	151.15° E	Magadan Secondary
PA 04 S.44	Yakutskaya ^m Oblast'	Okhotsk	116,415	59.20° N	143.15° E	Magadan Secondary
PA 04 T.01	Kol'skiy Poluostrrov	Murmansk	803,005	68.59° N	33.08° E	

a. All CC operatives in Ōsaka were lost during the depopulation of that area. New National HQ: Abashiri (PA 02 C.3). New Primary: Shizuoka (PA 02 S.13).

b. New Supreme High Command: Kagoshima, Kyūshū, Japan.

c. Research team PA 03 R.1 roves the arctic regions, and has no permanent base station. The scientists can often be found as near as possible (without crossing the 0° or 180° lines) to the research team of the Western Arctic Free Zone (TA 05 R.1).

d. New Regional HQ: Minsk, SSSR (PA 04 C.2).

e. "White Russia"

f. Replaces Moskva as Regional HQ, P.A.U. North.

g. Do not confuse with Krasnoyarskiy, to the southeast (51.59° N, 59.53° E).

h. Petropavlovsk-Kamchatskiy

i. On Primorskiy Kray

j. All CC operatives in Leningrad were lost during the depopulation of that area.

k. Fifty percent or more of the Magadan metro area consists of specialized high-tech facilities with numerous resident personnel.

l. Poland; a separate state of the SSSR, not in Russiya.

m. On Khabarovsk Kray

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
PA 04 T.02	Tyumenskaya Oblast'	Khanty Mansiysk	34,610	61.01° N	69.00° E	
PA 04 T.03	Mordovskaya Oblast'	Saratov	2,589,575	51.30° N	45.55° E	
PA 04 T.04	Kalmytskaya Oblast'	Astrakhan'	1,104,730	46.22° N	48.04° E	
PA 04 T.05	Kalmytskaya Oblast'	Makhachkali	620,070	42.59° N	47.30° E	
PA 04 T.06	Gruzinskaya Oblast'	Batumi	294,595	41.37° N	41.36° E	
PA 04 T.07	Sibir' (Siberia)	Nordvik	21,140	74.01° N	111.30° E	
PA 04 T.08	Sibir' (Siberia)	Dikson	17,890	73.32° N	80.39° E	
PA 04 T.09	Kazakhskaya Oblast'	Balkhash	185,310	46.50° N	74.57° E	
PA 04 T.10	Aral'skoye More ^a	Rybachiy Poselok ^b	78,400	45.05° N	59.13° E	
PA 04 T.11	Novosiberiskyye Ost. ^c	Kotel'nyy	63,133	75.59° N	138.00° E	
PA 04 T.12	Magadan	Provideniya	135,510	64.30° N	171.11° E	
PA 04 T.13	Yakutskaya Oblast'	Yakutsk	368,240	62.10° N	129.50° E	
PA 04 T.14	Sakhalinskaya Ostrova	Okha	38,765	53.35° N	143.01° E	

Nation #5: Taehan-Min'guk (Republic of South Korea)

PA 05 C.1	—	Söul ^d	25,599,280	37.30° N	127.00° E	Taehan-Min'guk National HQ
PA 05 P.1	—	Pusan ^e	6,841,300	35.05° N	129.02° E	
PA 05 S.11	Liaoning, Zhongguo 3	Dandong	26,135	40.08° N	124.24° E	Pusan Secondary
PA 05 S.12	— (C.M.I.K.)	Wönsan	510,800	39.07° N	127.26° E	Replaces PA 05 P.1
PA 05 S.13	—	Kunsan	397,760	35.57° N	126.42° E	Pusan Secondary
PA 05 S.14	—	Mokp'o	501,110	34.50° N	126.25° E	Pusan Secondary

Region B (Southwest)**Nation # 1: Al-'Arabīyah as-Sa'ūdīyah (Saudi Arabia)**

PB 01 C.1	Hejaz Asir	Jidda (Juddah)	1,333,100	21.30° N	39.10° E	Al-'Arabīyah as-Sa'ūdīyah HQ
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Nation # 2: Al-'Irāq (Iraq)

PB 02 C.1		Al-Basrah (Basra)	881,205	30.30° N	47.50° E	Al-'Irāq National HQ
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Nation # 3: Irān

PB 03 C.1	—	Bandar e-Torkeman	39,890	35.57° N	49.03° E	Irān National HQ
PB 03 T.01	—	Chäh Bahär	10,850	25.16° N	60.14° E	

Nation # 4: Ittihad Al-'Arabīyah (United Arab Emirates)

No bases

Nation # 5: Ittihad al-Imārāt al-'Hadramawt (United Hadramawt Emirates)

PB 05 C.1	P.D.R. Yemen	Aden	645,280	12.47° N	45.03° E	Ittihad National HQ
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Nation # 6: Jerusalem Free City-State

PB 06 C.1	—	Jerusalem ^f	997,850	31.47° N	35.13° E	Regional HQ, P.A.U. Southwest
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Nation # 7: Pākistān

PB 07 C.1	—	Sukkur	377,240	27.42° N	68.54° E	Pākistān National HQ
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a. Aral Sea

b. On the Ostrova (island) Vozrozhdeniya

c. New Siberian Islands (Ostrova)

d. Seoul; Command base was lost in the depopulation of that area. No replacement HQ has been designated.

e. All CC operatives in Pusan were lost in the depopulation of that area. Due to the loss of both Söul and Pusan, the Primary was moved to Wönsan, Chosön Minjujuüi In'min Konghwaguk (PA 05 S.12), under the P'yongyang command.

f. Also known as El Quds Esh Sherif or Yerushalayim.

P.A.U. Bases: Region B (Southwest), Sinai

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
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Nation # 8: Sinai

No bases

Nation # 9: United Arab States of As-Sūriyah, Al-Lubnān, Al-Urdunn (Syria, Lebanon, Jordan)

PB 09 C.1	As-Sūriyah	Al Lādhiqīyah (Latakia)	484,675	35.31° N	35.47° E	United Arab States National HQ
PB 09 T.01	As-Sūriyah	Ar Raqqah	115,230	35.57° N	39.03° E	

Nation #10: Yisra'el (State of Israel)

PB 10 C.1	—	Tel Aviv-Yafo ^a	3,207,400	32.05° N	34.46° E	Yisra'el National HQ & Primary
PB 10 S.11	As-Sūriyah (U.A.S.)	Tartūs	18,745	34.55° N	35.52° E	Tel Aviv-Yafo Secondary
PB 10 S.12	Al-Lubnān (U.A.S.)	Soūr ^b	29,700	33.16° N	35.12° E	Tel Aviv-Yafo Secondary
PB 10 S.13	—	Ashdod	148,015	31.48° N	34.38° E	Tel Aviv-Yafo Secondary
PB 10 S.14	—	Elat (Elath)	44,905	29.33° N	34.57° E	Tel Aviv-Yafo Secondary

Region C (Southeast)**Nation # 1: Bengal States (Islands, including Andaman & Nicobar)**

No bases

Nation #2: Bhārat (Republic of India)

PC 02 C.1	Uttar Pradesh	Kānpur ^c	3,136,125	26.27° N	80.14° E	Bhārat National HQ
PC 02 P.1	Mahārāshtra	<i>Bombay^d</i>	16,036,600	18.56° N	72.51° E	New Primary: PC 02 S.14
PC 02 S.11	Gujarat	Porbandar	253,565	21.40° N	69.40° E	Bombay Secondary
PC 02 S.12	Gujarat	Bharuch	18,450	21.40° N	73.02° E	Bombay Secondary
PC 02 S.13	Karnataka	Kārwār	7,125	14.50° N	74.09° E	Bombay Secondary
PC 02 S.14	Karnataka	Mangalore	512,000	12.54° N	74.51° E	Replaces PC 02 P.1
PC 02 T.01	Bangladesh	Chittagong	2,851,025	22.20° N	91.48° E	Reports to PC 02 C.1
PC 02 T.02	Kerala	Mattancheri	41,505	09.51° N	76.16° E	Reports to PC 02 C.1

Nation # 3: Druk-Yul (Bhutan)

PC 03 R.1	—	Tashigang	5,940	27.19° N	91.33° E	Reports to PC 02 C.1
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Nation # 4: Krā (Malay Peninsula)

No bases

Nation #5: Lao (Kampuchea, Laos, Thailand, and Viet-nam)

PC 05 C.1	Viet-nam D.C. ^e	Da Nang	1,040,475	16.04° N	108.14° E	
PC 05 C.2	Prathet Thai ^f	<i>Krung Thep^g</i>	8,022,860	13.44° N	100.30° E	Lao National HQ & Tertiary

a. In a surprising maneuver (technically illegal, for reasons of military rank and command structure), two of the Type-1 CC operatives stationed in Tel Aviv-Yafo were placed in command of all conventional forces of the "Middle East." They were equipped with new programming and devices supplied by Trans-American CC bases, and the third CC coordinated details while ensuring interforce communications. After six days of intense combat, the CCs and their allies succumbed to an overwhelming influx of enemy troops, establishing in the process what may have been the best resistance offered by any of Earth's forces. A fully documented record was provided by the third (coordinating) CC, who survived due to her remote location relative to the combat. During the fighting, all personnel at the Yisra'el Primary in Tel Aviv-Yafo were transferred to Ashdod (though the former remains undamaged) for reasons of general security.

b. Also known as Sūr, or Tyre.

c. Do not confuse with Kānpur, Orissa (20.25° N, 85.15° E).

d. All CC operatives in Bombay were lost during the depopulation of that area. New Primary: Mangalore (PC 02 S.14).

e. Viet-nam Dan-Chu Cong-ha

f. Thailand

g. Bangkok; new HQ: Phnom Pénh (PC 05 C.3)

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
PC 05 C.3	Kämpuchéa Pr. ^a	Phnom Pénh	936,580	11.35° N	104.55° E	Replaces PC 05 C.2 Reports to PC 05 C.3
PC 05 T.01	Kämpuchéa Pr.	Kompong Som ^b	58,400	10.38° N	103.28° E	
Nation #6: Myanma (Socialist Republic of the Union of Burma)						
PC 06 C.1	Pegu	Rangoon ^c	7,127,400	16.47° N	96.10° E	Myanma National HQ & Primary
PC 06 S.11	Tenasserim	Martaban	24,240	16.32° N	97.35° E	Rangoon Secondary
PC 06 S.12	Irrawaddy	Pyapon	30,065	16.15° N	95.40° E	Replaces PC 06 C.1 Primary
PC 06 S.13	Mon State	Tavoy	125,920	14.02° N	98.12° E	Replaces PC 06 C.1 Natl. HQ
PC 06 S.14	Prathet Thai (Lao)	S. Songkhram ^d	46,390	13.25° N	100.01° E	Rangoon Secondary
Nation # 7: Nepāl (Nepal)						
PC 07 R.1	—	Ghumthang	21,715	27.52° N	85.51° E	Reports to PC 02 C.1
Nation # 8: Sri Lanka						
PC 08 C.1	—	Colombo	3,660,800	06.55° N	79.52° E	Sri Lanka National HQ
Nation #9: Zhongguo (People's Republic of China)						
PC 09 C.1	Beijing	Beijing ^e	28,213,050	39.55° N	116.26° E	HQ, Zhongguo Sectors 1 & 2
PC 09 C.2	Guangdong	Guangzhou ^f	5,942,860	23.08° N	113.20° E	Regional HQ, P.A.U. Southeast
PC 09 C.3	Sichuan	Chongqing ^g	6,893,715	29.30° N	106.35° E	HQ, Zhongguo Sector 3 (SE)
PC 09 P.1	Tianjin	Tianjin ^h	16,640,000	39.00° N	117.42° E	New Primary: PC 09 S.11
PC 09 P.2	T'aiwan	T'aipei ⁱ	9,087,400	25.13° N	121.29° E	New Primary: PC 09 S.22
PC 09 P.3	Hong Kong	Victoria ^j	15,384,125	22.16° N	114.13° E	New Primary: PC 09 S.33
PC 09 R.1	Xizang Zizhiqu ^k	Qumigxung	455	30.53° N	86.38° E	
PC 09 R.2	Xizang Zizhiqu	Chang La ^l	75	28.01° N	86.56° E	
PC 09 S.11	Liaoning	Yingkou ^m	416,380	40.40° N	122.17° E	Replaces PC 09 P.1 & C.1
PC 09 S.12	Hebei	Qinhuangdao	181,210	39.55° N	119.37° E	Tianjin Secondary
PC 09 S.13	Liaoning	Dalian	224,485	38.53° N	121.37° E	Tianjin Secondary
PC 09 S.14	Shandong	Yantai	51,945	37.30° N	121.22° E	Tianjin Secondary
PC 09 S.21	Fujian	Ningde	83,825	26.40° N	119.30° E	T'aipei Secondary
PC 09 S.22	Fujian	Quanzhou	447,500	24.53° N	118.36° E	Replaces PC 09 P.2
PC 09 S.23	T'aiwan	T'ai-Tung	100,345	22.43° N	121.10° E	T'aipei Secondary
PC 09 S.24	T'aiwan	Kao-Hsiung	64,590	22.36° N	120.17° E	T'aipei Secondary
PC 09 S.31	Guandong	Shantou	116,250	23.23° N	116.39° E	Victoria Secondary
PC 09 S.32	Guandong	Lufeng ⁿ	322,265	22.59° N	115.40° E	Victoria Secondary
PC 09 S.33	Guandong	Yangjiang	142,630	21.52° N	111.52° E	Replaces PC 09 P.3
PC 09 S.34	Guandong	Zhanjiang	95,445	21.10° N	110.20° E	Victoria Secondary
PC 09 T.01	Mongolia	Choybalsan	350,000	48.02° N	114.32° E	Reports to PC 09 C.1
PC 09 T.02	Qinghai	Heimahe	81,205	36.40° N	100.00° E	Reports to PC 09 C.1
PC 09 T.03	Anhui	Tongling ^o	131,450	30.57° N	117.40° E	Reports to PC 09 C.3
PC 09 T.04	Sichuan	Yibin ^p	69,270	28.50° N	104.35° E	Reports to PC 09 C.3
PC 09 T.05	Guandong	Haikou	653,715	20.05° N	110.25° E	Replaces PC 09 C.3

a. Kämpuchéa Prächéathipätéy (Kampuchea, or Cambodia).

b. Sihanoukville, on the end of the peninsula; not the town of Kompong Som on the Piphat river to the northeast (11.03° N, 103.41° E).

c. All CC operatives in Rangoon assisted in the city's evacuation but escaped into the Andaman Sea during the depopulation. New National HQ: Tavoy (PC 06 S.13). New Primary: Pyapon (PC 06 S.12).

d. Samut Songkhram

e. aka Peking or Peiping. New Sector 1 HQ: Choybalsan, Mongolia (PC 09 T.01). New Sector 2 HQ: Yingkou (PC 09 S.11).

f. Canton. New Regional HQ: Da Nang, Lao (PC 05 C.1).

g. Chungking; New HQ: Haikou (PC 09 T.05).

h. All CC operatives in Tianjin (aka Tientsin or Tienching) were lost in the depopulation of that area. New Primary: Yingkou (PC 09 S.11).

i. All CC operatives in T'aipei escaped into the ocean before the area was depopulated. New Primary: Quanzhou (PC 09 S.22).

j. All CC operatives based in Victoria were at Chang La Pass Research base (PC 09 R.2) at the time of the invasion, and survived. New Primary: Yangjiang (PC 03 S.33).

k. XizangTibetan Autonomous Region

l. Chang La Pass, about two miles from Mt. Everest.

m. Do not confuse with the small town of Yingkou, which is commonly known as Dashiqiao (40.38° N, 122.30° E).

n. Do not confuse with Lufeng in Yunnan province 25.07° N, 102.10° E.

o. Greater southern Tongling, not the nearby smaller town of the same name (30.58° N, 117.48° E).

p. Greater northern Yibin, not the nearby smaller town of the same name (28.42° N, 104.30° E).





Trans-American Union

In population, land area, and food production, the T.A.U. is the second largest bloc on the globe. It is the richest in total wealth, but places third (after Europe and Oceania) on a per capita income basis. It also leads the world in both overall standard of living and technological expertise, but stays barely ahead of Pan-Asia in the latter category.

Dallas, Texas, the capital of the Union, is located in its most prosperous nation, the United States of America. The T.A.U. is divided into three regions on a geographic basis. The North is completely dominated by the U.S.A. Control of the Central region balances between México and the Caribbean nations, since the leaders of the Central American countries are far too busy coping with poor resources and overpopulation to be concerned with regional politics. South America, shaken by the war of 2005-2009, dangles from the economic apron-strings of the oil-rich nations on the northern coast.

The U.S.A., Canada, Hispaniola, and Venezuela are responsible for over 90% of the Union's world leadership in technology. Overpopulation in Central and South America accounts for the Union's #2 position in world population, and for the resultant drop in per capita income. The primary T.A.U. food-producing areas are the great plains of Canada and the U.S.A., as well as the new croplands where once stood the great Amazonian jungle of Brasil.

In the key that begins on the next page, bases are listed in order under the nation to which they report. CC bases in italicized cities were lost during the depopulation of those metro areas.

CC Command Structure

Losses incurred during the invasion are marked with an asterisk. Post-invasion changes are given at the end of each region.

National, International, and Sector HQ are listed under the Regional command bases to which they report. Primary bases are listed under the appropriate local commands. All secondary, tertiary, and research bases technically report directly to the local HQ. Bases destroyed in the invasion are marked with an asterisk. See the individual CC base listings in the Key to CC Bases for details on replacement bases.

- * **Supreme High Command:** Houston, State of Texas, U.S.A. (TA 04 C.4)
- Region A (North) Command:** New Orleans, State of Louisiana, U.S.A. (TA 04 C.3)
 - Canada Sector 1 (West) and Arctic Free Zone, International HQ: Prince George, Province of British Columbia, Canada (TA 02 C.1)
 - Primary: Vancouver (TA 02 P.1)
 - Canada Sector 2 (East) and Grønland, International HQ: Quebec, Province of Quebec, Canada (TA 02 C.2)
 - Primary: St. Johns (TA 02 P.2)
 - U.S.A. Sector 1 (West) HQ: Flagstaff, Arizona (TA 04 C.1)
 - * Primary: San Francisco, California (TA 04 P.1)
 - * U.S.A. Sector 2 (Central) HQ: St. Louis, Missouri (TA 04 C.2)
 - * Primary: Chicago, Illinois (TA 04 P.2)
 - Primary: Corpus Christi, Texas (TA 04 P.3)
 - U.S.A. Sector 3 (East) HQ: Richmond, Virginia (TA 04 C.5)
 - * Primary: Boston, Massachusetts (TA 04 P.4)
 - * Primary: Cape Canaveral, Florida (TA 04 P.5)
- Region B (Central) Command:** Mérida, State of Yucatán, México (TB 08 C.2)
 - * México Sector 1 (North) HQ: Monterrey, Nuevo León (TB 08 C.1)
 - Primary: Mazatlán (TB 08 P.1)
 - México Sector 2 (South) HQ: Acapulco, Guerrero (TB 08 C.3)
 - Primary: Llave (TB 08 P.2)
 - Panama National HQ: Colón (TC 10 C.1)
 - Primary: Panamá (TC 10 P.1)
 - Republicas Americanas HQ: San Juan, Puerto Rico, Hispaniola (TB 06 C.2)
 - Other National HQ: Nassau, Bahamas; Limón, Costa Rica; Santiago de Cuba, Cuba; San Salvador, El Salvador; Antigua, Guatemala; Santo Domingo, Republicas Dominicanas, Hispaniola; La Ceiba, Honduras; Managua, Nicaragua; Colón, Panama.
- Region C (South) Command:** Belém, State of Tocantín, Brasil (TC 05 C.1)
 - * Argentina National HQ: Santiago, Province of Chile (TC 02 C.1)
 - * Primary: Buenos Aires (TC 02 P.1)
 - * Brasil National HQ: São Paulo (TC 05 C.2)
 - Primary: Fortaleza (TC 05 P.1)
 - Venezuela National HQ: Maracaibo (TC 11 C.1)
 - * Primary: Caracas (TC 11 P.1)
 - Other National HQ: Paramaribo, State of Suriname, Atlantic States; La Paz, Bolivia; Guyazuil, Province of Ecuador, Colombia; Willemstad, Island of Curacao, Confederated Caribbean Territories (CCT); Stanley, Islas Malvinas; Santarém, Selvás.

CC Base Staffing

Base	Metro area	Initial CC Staffing		CC Losses in Invasion		New CC Staffing	
		T-1	T-2	T-1	T-2	T-1	T-2
TA 02 P.1	Vancouver	3	1	3	0	0	1
TA 02 P.2	St Johns	4	1	3	0	1	1
TA 04 P.1	<i>San Francisco</i>	1	3	1	0	0	3
TA 04 P.2	<i>Chicago</i>	2	2	2	2	0	0
TA 04 P.3	Corpus Christi	2	3	1	0	1	3
TA 04 P.4	<i>C. Canaveral</i>	0	5	0	0	0	5
TA 04 P.5	Boston	1	3	1	0	0	3
TB 08 P.1	Mazatlán	3	1	3	0	0	1
TB 08 P.2	Llave	2	1	2	0	0	1
TB 10 P.1	Panamá	3	1	3	0	0	1
TC 01 P.1	<i>Buenos Aires</i>	1	2	1	2	0	0
TC 05 P.1	Fortaleza	1	1	1	0	0	1
TC 11 P.1	Caracas	2	1	1	0	1	1
		25	25	22	4	3	21

Key to CC Bases of the Trans-American Union

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
Region A (North)						
Nation # 1: Bermuda						
TA 01 T.01	Bermuda Island	Hamilton	28,430	32.18° N	64.48° W	Reports to Int. HQ (TA 04 C.5)
Nation # 2: Canada						
TA 02 C.1	British Columbia	Prince George	135,150	53.55° N	122.49° W	Intl. HQ, Canada 1 & Arctic FZ
TA 02 C.2	Quebec	Quebec	1,222,700	46.50° N	71.15° W	Intl. HQ, Canada 2 & Grønland
TA 02 P.1	British Columbia	Vancouver	3,140,600	49.13° N	123.06° W	Sector 1 Primary
TA 02 P.2	Newfoundland	St. Johns ^a	323,375	47.34° N	52.41° W	Sector 2 Primary
TA 02 R.1	Northwest Territory	Resolute	1,350	74.40° N	95.00° W	Reports to TA 02 C.1
TA 02 S.11	British Columbia	Kitimat	26,600	54.05° N	128.38° W	Vancouver Secondary
TA 02 S.12	British Columbia	Prince Rupert	33,275	54.18° N	130.17° W	Vancouver Secondary
TA 02 S.13	British Columbia	Squamish	2,250	49.41° N	123.11° W	Vancouver Secondary
TA 02 S.14	Washington (U.S.A.)	Bellingham	103,275	48.45° N	122.29° W	U.S.A., Sect. 1, Vancouver Sec.
TA 02 S.21	Newfoundland	Twillingate	5,650	49.38° N	54.45° W	St. Johns Secondary
TA 02 S.22	Newfoundland	Stephenville	23,200	48.33° N	58.34° W	St. Johns Secondary
TA 02 S.23	New Brunswick	Caraquet	12,800	47.48° N	64.59° W	St. Johns Secondary
TA 02 S.24	Nova Scotia	Glace Bay	49,250	46.11° N	59.58° W	St. Johns Secondary
TA 02 T.01	Northwest Territory	Tuktoyaktuk	1,700	69.27° N	133.00° W	Reports to TA 02 C.1
TA 02 T.02	Manitoba	Churchill	3,850	58.45° N	94.00° W	Reports to TA 02 C.2
TA 02 T.03	Manitoba	Grand Rapids	2,050	53.12° N	99.19° W	Reports to TA 02 C.2
Nation # 3: Grønland						
TA 03 R.1	—	Nord	400	81.30° N	17.30° W	Reports to Int. HQ (TA 02 C.2)
TA 03 T.01	—	Scoresbysund	945	70.30° N	22.00° W	Reports to Int. HQ (TA 02 C.2)
TA 03 T.02	—	Godthåb	19,275	64.15° N	51.35° W	Reports to Int. HQ (TA 02 C.2)
Nation #4: United States of America						
TA 04 C.1	Arizona	Flagstaff	78,125	35.12° N	122.49° W	HQ, U.S.A., Sector 1 (West)
TA 04 C.2	Missouri	St. Louis ^b	5,325,490	38.40° N	90.15° W	HQ, U.S.A. Sector 2 (Central)
TA 04 C.3	Louisiana	New Orleans	2,925,335	30.00° N	90.03° W	Regional HQ, T.A.U. (North)
TA 04 C.4	Texas	Houston ^c	6,041,200	29.45° N	95.25° W	Supreme High Command
TA 04 C.5	Virginia	Richmond	494,375	37.34° N	77.27° W	Intl. HQ, U.S.A. 3 & Bermuda
TA 04 P.1	California	San Francisco ^d	4,632,910	37.45° N	122.27° W	New Primary: TA 04 S.14
TA 04 P.2	Illinois	Chicago ^e	6,777,050	41.50° N	37.45° W	New Primary: TA 04 S.21
TA 04 P.3	Texas	Corpus Christi	523,200	26.46° N	97.26° W	Sector 2 Primary
TA 04 P.4	Massachusetts	Boston	7,502,220	42.20° N	71.05° W	New Primary: TA 04 S.44
TA 04 P.5	Florida	Canaveral ^f	88,500	28.28° N	80.32° W	New Primary: TA 04 S.52
TA 04 R.1	Hawaii	Hilo ^g	53,18	19.42° N	155.04° W	Reports to TA 04 C.1
TA 04 S.11	California	Eureka	54,475	40.49° N	124.10° W	San Francisco Secondary
TA 04 S.12	California	Elk	1,725	39.08° N	123.42° W	San Francisco Secondary
TA 04 S.13	California	Monterey	62,155	36.35° N	121.55° W	San Francisco Secondary
TA 04 S.14	California	Big Sur area	300	36.15° N	121.47° W	Replaces TA 04 P.1
TA 04 S.21	Wisconsin	Manitowoc	73,400	44.04° N	87.40° W	Replaces TA 04 P.2
TA 04 S.22	Michigan	Holland	59,270	42.46° N	86.06° W	Chicago Secondary
TA 04 S.23	Illinois	Cairo	13,375	37.01° N	89.09° W	Chicago Secondary
TA 04 S.24	Michigan	Escanaba	32,375	45.47° N	87.04° W	Chicago Secondary
TA 04 S.31	Louisiana	Morgan City	36,350	29.41° N	91.13° W	Corpus Christi Secondary
TA 04 S.32	Texas	Freeport	30,325	28.56° N	95.20° W	Corpus Christi Secondary

a. Fifty percent or more of the St. Johns metro area consists of specialized high-tech facilities with numerous resident personnel.⁷

b. New HQ: Memphis, state of Tennessee. There was no base at this location prior to the invasion.

c. New T.A.U. High Command: New Orleans (TA 04 C.3), which is also the North Regional Command.

d. The Type-1 CC assigned to San Francisco was lost during the depopulation of this area. All Type-2 CC operatives escaped prior to that incident.

e. All CC operatives in Chicago were lost in the depopulation of that area.

f. All CC operatives based at Canaveral were engaged in underwater testing operations on the Atlantic ocean floor at the time of the invasion. They were ordered to escape without detection, and succeeded. Priority 1: Activate replacement base at Bayport, Florida (TA 04 S.52). Priority 2: Activate secondary base in Stuart, Florida (TA 04 S.53).

g. Hilo research primarily involves the Mauna Loa volcano 40 miles to the southwest, though some undersea testing is also performed.

T.A.U. Bases: Region A (North), U.S.A. (cont.)

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
TA 04 S.33	Texas	Port Lavaca	24,600	28.36° N	96.39° W	Corpus Christi Secondary
TA 04 S.34	Texas	Port Isabel	8,500	26.04° N	97.14° W	Corpus Christi Secondary
TA 04 S.41	Maine	Addison	800	44.38° N	67.46° W	Boston Secondary
TA 04 S.42	New York	Oswego	44,640	43.27° N	76.31° W	Boston Secondary
TA 04 S.43	New Hampshire	Portsmouth	59,210	43.03° N	70.47° W	Boston Secondary
TA 04 S.44	Massachusetts	New Bedford	222,090	41.38° N	70.55° W	Replaces TA 04 P.4
TA 04 S.51	Georgia	Brunswick	39,700	31.09° N	81.30° W	Canaveral Secondary
TA 04 S.52	Florida	Bayport	1,050	28.33° N	82.39° W	Replaces TA 04 P.5
TA 04 S.53	Florida	Stuart	21,350	27.12° N	80.16° W	Canaveral Secondary
TA 04 S.54	Florida	Flamingo	860	25.08° N	80.07° W	Canaveral Secondary
TA 04 T.01	Alaska	Juneau	44,050	58.20° N	134.20° W	Reports to TA 04 C.1
TA 04 T.02	Alaska	Fort Randall	1,540	55.10° N	162.47° W	Reports to TA 04 C.1
TA 04 T.03	New Mexico	Albuquerque	748,200	35.05° N	106.38° W	Reports to TA 04 C.1
TA 04 T.04	North Dakota	Bismarck	100,325	46.50° N	100.48° W	Reports to TA 04 C.2
TA 04 T.05	Tennessee	Chattanooga	382,400	35.02° N	85.18° W	Reports to TA 04 C.2

Nation # 5: Western Arctic Free Zone

TA 05 R.1	—	(mobile) ^a	28	85-90° N	1-179° W	
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Region B (Central)**Nation # 1: Bahamas**

TB 01 C.1	New Providence	Nassau	310,350	25.05° N	77.20° W	Bahamas National HQ
TB 01 T.01	North Caicos Island	Kew	8,410	21.55° N	72.04° W	

Nation # 2: Costa Rica

TB 02 C.1	—	Limón	133,920	10.00° N	83.01° W	Costa Rica National HQ
TB 02 T.01	—	Puntarenas	88,670	10.00° N	84.50° W	

Nation # 3: Cuba

TB 03 C.1	—	Santiago de Cuba	996,945	20.00° N	75.49° W	Cuba National HQ
TB 03 T.01	—	Cienfuegos	281,930	22.10° N	80.27° W	

Nation # 4: El Salvador

TB 04 C.1	—	San Salvador	2,201,400	13.40° N	89.10° W	El Salvador National HQ
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Nation # 5: Guatemala

TB 05 C.1	—	Antigua	54,100	14.33° N	90.42° W	Guatemala National HQ
TB 05 T.01	Belize	Belize City	126,885	17.29° N	88.10° W	

Nation # 6: Hispaniola

TB 06 C.1	Republicas Dominicas ^b	Santo Domingo	2,995,160	18.30° N	69.57° W	Dominican Republic Natl. HQ
TB 06 C.2	Puerto Rico	San Juan	4,293,260	18.29° N	66.08° W	Republicas Americanas HQ
TB 06 T.01	Jamaica	Montego Bay	133,780	18.27° N	77.56° W	
TB 06 T.02	Haiti	Jacmel	36,445	18.18° N	72.32° W	

Nation # 7: Honduras

TB 07 C.1	—	La Ceiba	137,280	15.45° N	86.45° W	Honduras National HQ
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a. The "base" in the Western Arctic Free Zone consists of a research team with equipment. The team moves around to various locations and has no permanent base station.

b. Dominican Republic

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
TB 07 T.01	—	Barra Kruta	23,500	15.15° N	83.24° W	
Nation #8: United Mexican States						
TB 08 C.1	Nuevo León	Monterrey ^a	5,885,700	25.40° N	100.20° W	HQ, México Sector 1 (North)
TB 08 C.2	Yucatán	Mérida	804,735	20.59° N	89.39° W	Regional HQ, T.A.U. Central
TB 08 C.3	Guerrero	Acapulco	1,287,515	16.51° N	99.56° W	HQ, México Sector 2 (South)
TB 08 P.1	Sinaloa ^b	Mazatlán ^c	543,320	23.11° N	106.25° W	
TB 08 P.2	Veracruz ^b	Llave ^d	1,115,990	19.11° N	96.10° W	
TB 08 S.11	Sonora	Guaymas	175,790	27.59° N	110.54° W	Replaces TB 08 C.1
TB 08 S.12	Baja California	La Paz	140,675	24.10° N	110.17° W	
TB 08 S.13	Jalisco	Puerto Vallarta	73,850	20.36° N	105.15° W	
TB 08 S.14	Colima	Manzanillo	63,535	19.00° N	104.20° W	
TB 08 S.21	Nuevo Leon	La Pesca	19,875	23.46° N	97.47° W	
TB 08 S.22	Quintana Roo	Puerto Juarez	13,760	21.10° N	86.50° W	
TB 08 S.23	Veracruz	Tuxpan ^e	103,650	20.58° N	97.23° W	
TB 08 S.24	Veracruz	Coatzacoalcos	365,205	18.10° N	94.25° W	
TB 08 T.01	Campeche	Campeche	316,760	19.50° N	90.30° W	
Nation # 9: Nicaragua						
TB 09 C.1	—	Managua	1,690,490	12.06° N	86.18° W	Nicaragua National HQ
TB 09 T.01	—	Puerto Cabezas	16,970	14.02° N	83.24° W	
Nation #10: Republic of Panama						
TB 10 C.1	—	Colón	250,715	09.21° N	79.54° W	Panama National HQ
TB 10 P.1	—	Panamá	1,972,085	08.57° N	79.30° W	
TB 10 S.11	— (El Salvador)	La Unión	11,465	13.20° N	87.50° W	Panamá Secondary
TB 10 S.12	—	Cristóbal	14,675	09.21° N	79.54° W	Panamá Secondary
TB 10 S.13	—	Chimán	6,420	08.42° N	78.35° W	Panamá Secondary
TB 10 S.14	— (Costa Rica)	Golfito	15,900	08.42° N	83.10° W	Panamá Secondary
Nation # 11: Republicas Americanas						
TB 11 T.01	Guadeloupe	Point-à-Pitre	180,395	16.14° N	61.32° W	Reports to TB 06 C.2

Region C (South)

Nation # 1: Archipelágo de Colón

No bases

Nation # 2: Argentine Republic

TC 02 C.1	Chile	Santiago ^f	11,290,500	33.30° S	7.40° W	Argentina National HQ
TC 02 P.1	Buenos Aires	Buenos Aires ^g	39,757,500	34.40° S	58.30° W	New Primary: TC 02 S.14
TC 02 R.1	Chile	Punta Arenas	150,210	53.10° S	70.56° W	
TC 02 S.11	Uruguay (Brasil)	Maldonado	59,290	34.57° S	54.59° W	Buenos Aires Secondary
TC 02 S.12	Chile	Constitución	9,460	35.20° S	72.28° W	Buenos Aires Secondary
TC 02 S.13	Buenos Aires	Mar del Plata	1,609,620	38.00° S	57.32° W	Buenos Aires Secondary
TC 02 S.14	Buenos Aires	Necochea	153,900	38.31° S	58.46° W	Replaces TC 02 P.1
TC 02 T.01	Chile	Iquique	251,055	20.15° S	70.08° W	Replaces TC 02 C.1

a. New HQ: Guaymas, Sonora (TB 08 S.11)

b. All Type-1 CC operatives in México were lost during initial engagements with the enemy.

c. Fifty percent or more of the Mazatlán metro area consists of specialized high-tech facilities with minimal resident personnel.

d. City of Veracruz

e. Tuxpan de Rodríguez Caño, do not confuse with Tuxpan, Jalisco, or with Tuxpan, Nayarit.

f. New HQ: Inquique (TC 02 T.01).

g. All CC operatives in Buenos Aires were lost during the depopulation of that region.

T.A.U. Bases: Region C (South), Argentine Republic (cont.)

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
TC 02 T.02	Rio Negro	Viedma	18,065	40.45° S	63.00° W	

Nation # 3: Atlantic States

TC 03 C.1	Suriname	Paramaribo	675,500	05.52° N	55.14° W	Atlantic States National HQ
TC 03 T.01	Guyane française ^a	Cayenne	117,575	04.55° N	52.18° W	

Nation # 4: Bolivia

TC 04 C.1	—	La Paz	4,016,930	16.30° S	68.10° W	Boliva National HQ
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Nation #5: Federative Republic of Brasil

TC 05 C.1	Tocantin	Belém	3,687,045	01.27° S	48.29° W	Regional HQ, T.A.U. South Brasil National HQ
TC 05 C.2	São Paulo	São Paulo ^b	38,214,000	23.33° S	46.39° W	
TC 05 P.1	Ceará	Fortaleza ^c	4,435,500	03.45° S	38.35° W	
TC 05 S.11	Piauí	Parnaíba	220,135	02.58° S	41.46° W	
TC 05 S.12	Rio Grande de Norte	Natal ^d	968,010	05.35° S	42.37° W	
TC 05 S.13	Alagoas	Penedo	83,955	10.16° S	36.33° W	
TC 05 S.14	Bahia	Santo Amaro ^e	58,675	12.35° S	38.41° W	
TC 05 T.01	Minas Gerais	Conceição de Barra	45,550	18.36° S	39.46° W	
TC 05 T.02	Santa Catarina	Itajaí	208,960	26.50° S	48.39° W	Replaces TC 05 C.2

Nation # 6: Colombia

TC 06 C.1	Guayas, Ecuador	Guayaquil	4,319,495	02.13° S	79.54° W	Colombia National HQ
TC 06 T.01	Ancash, Peru	Chimbote	613,915	09.04° S	78.34° W	

Nation # 7: Confederated Caribbean Territories (C.C.T.)

TC 07 C.1	Curacao	Willemstad	363,360	12.12° N	68.56° W	CCT National HQ
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Nation # 8: Islas Malvinas (Falkland Islands)

TC 08 C.1	—	Stanley	4,170	51.45° S	57.56° W	Islas Malvinas National HQ
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Nation # 9: Selvás

TC 09 C.1	—	Santarém	197,335	02.26° S	54.41° W	Selvás National HQ
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Nation # 10: Tierra del Fuego

No bases

Nation #11: Republic of Venezuela

TC 11 C.1	—	Maracaibo	3,961,840	10.44° N	71.37° W	Venezuela National HQ
TC 11 P.1	—	Caracas ^f	9,553,500	10.35° N	66.56° W	Venezuela Primary
TC 11 S.11	Falcón	Puerto Cumarebo	33,970	11.31° N	69.30° W	Caracas Secondary
TC 11 S.12	Anzoategui	Puerto La Cruz	244,240	10.14° N	64.40° W	Caracas Secondary
TC 11 S.13	Bolívar	Ciudad Guayana ^g	554,065	08.22° N	62.37° W	Replaces TC 11 P.1
TC 11 S.14	Guayana (Atlantic Sts.)	Georgetown	722,030	06.46° N	58.10° W	Caracas Secondary

a. French Guiana

b. New HQ: Itajaí (TC 05 T.02)

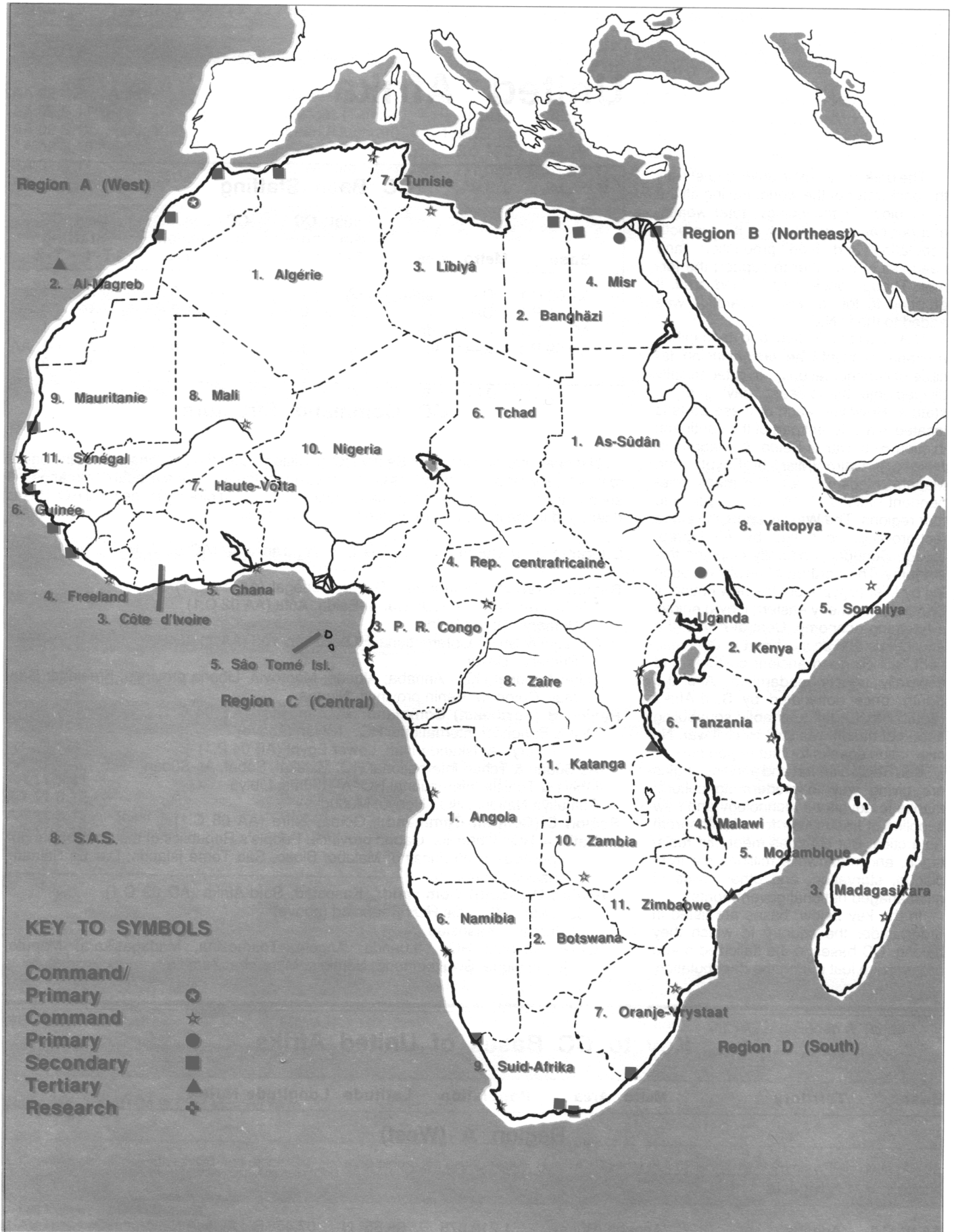
c. The Type-1 CC operative in Brasil was lost during initial engagements with the enemy.

d. In Rio Grande de Norte; do not confuse with Natal (Amazonas) in Selvás (06.59° S, 60.16° W).

e. Do not confuse with Santo Amaro (Maranhão) Brasil (02.31° S, 43.10° W).

f. One Type-1 CC operative in Venezuela was lost during initial engagements. The remaining Type-1 was deactivated in the process but was recovered, barely alive, nine days later. New Primary: Ciudad, Guayana (TC 11 S.13).

g. Also known as Santo Tomé de Guayana



United Afrika

The dark continent is unfortunately still the backwater of the world, trailing all the other blocs in technology, total wealth, and per capita income. It is third in both population and food production, and needs all of the latter to support the former. Though once third in land area, it dropped to fourth when Antarctica was added to the U.N.O.

U.A. is a land divided, and its "capital," Afrikana, presents an unconvincing facade of continental unity. It is technically divided into thirds, each having equal stature. However, each of these parts is located in a different part of the continent: in suburbs of Dar-el-Beida (Al-Magreb, or Morocco), Cairo (Misr, or Egypt), and Maputo (Moçambique). The many independent nations of UA are grouped into four regions. The West is aggressive and fast-growing, controlled by Al-Magreb, though Sênêgal constantly disputes this authority. The Northeast has always been led by Misr (Egypt), but the new nation of Banghazi (formerly eastern Libya) enjoys a booming economy. Central Afrika, the mysterious and scenic heart of the continent, still clings to ancient customs and generally rejects modernism. And the South, once dominated by Suid-Afrika (South Africa), fell to chaotic squabbling after that nation was split by civil war. No one nation speaks for that region now.

The Sahara desert and ancient jungles are giving way to modern agriculture, thanks to advanced technology and new supplies of fresh water for irrigation from Antarctica. But changes meet stiff resistance, and meanwhile millions die from plague, starvation, and other follies of mismanaged national governments.

In the key below, bases are listed in order under the country to which they belong. CC bases in the italicized metro areas were lost during the depopulation.

CC Base Staffing							
Base	Metro area	Initial CC Staffing		CC Losses in Invasion		New CC Staffing	
		T-1	T-2	T-1	T-2	T-1	T-2
AA 02 P.1	Dar-el-Beida	2	1	1	0	1	1
AA 11 P.1	Dakar	3	0	0	0	3	0
AB 04 P.1	Al-Iskandariyah	4	1	2	0	2	1
AD 09 P.1	Kaapstad	<u>4</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>3</u>	<u>1</u>
		13	3	4	0	9	3

CC Command Structure

National, International, and Sector HQ are listed under the Regional command bases to which they report. Primary bases are listed under the appropriate local commands. All secondary, tertiary, and research bases technically report directly to the local HQ. Bases destroyed in the invasion are marked with an asterisk.

Supreme High Command: Dar es Salaam, Tanzania (AC 06 C.1)

Region A (West) Command: Dakar, Sênêgal (AA 11 C.1)

* Al-Magreb National HQ: Dar-el-Beida, Anfa (AA 02 C.1)

Primary: Dar-el-Beida

Sênêgal & Guinée International HQ: Dakar, Yoff (AA 11 C.1)

Primary: Dakar

Other National HQ: 'Annaba, Algérie; Monrovia, Liberia province, Freeland; Gao, Mali; Cotonow, Benin province, Nigeria.

Region B (Northeast) Command: Aswân, Misr (AA 04 C.1)

Misr & Banghâzi International HQ: Aswân (above)

* Primary: Al-Iskandariyah, Lower Egypt (AB 04 P.1)

As-Sûdân & Tchad International HQ: Malakâl, Sobat, As-Sûdân

Lîbiyâ & Tunisie International HQ: Al-Khûms, Lîbiyâ

Somaliya National HQ: Hobyô, Mudug

Region C (Central) Command: Goma, Zaïre (AA 08 C.1)

National HQ: Libreville, Gabon province, People's Republics of the Congo; Bangui, République centrafricaine; Malabo, Bioko, São Tomé Islands; Dar Es Salaam, Tanzania; Goma, Zaire.

*** Region D (South) Command:** Kaapstad, Suid-Afrika (AD 09 C.1)

* Suid-Afrika National HQ: Kaapstad (above)

* Primary: Kaapstad

Other National HQ: Luanda, Angola; Toamasina, Madagasikara; Maputo, Moçambique; Swakopmund, Namibia; Maramba, Zambia.

Key to CC Bases of United Afrika

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
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Region A (West)

Nation # 1: Algérie

AA 01 C.1	'Annaba	'Annaba (Bône)	1,219,875	36.55° N	07.47° E	Algérie National HQ
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Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
Nation #2: Al-Magreb (Kingdom of Morocco)						
AA 02 C.1	Anfa	Dar-el-Beida ^a	6,134,900	33.39° N	07.35° W	Al-Magreb Natl. HQ & Pri.
AA 02 S.11	—	Tanger (Tangier)	731,885	35.48° N	05.50° W	Dar-el-Beida Secondary
AA 02 S.12	— (Algérie)	Oran (Ouahrán)	1,889,715	35.45° N	00.38° W	Dar-el-Beida Secondary
AA 02 S.13	—	Safi	502,920	32.18° N	09.20° W	Dar-el-Beida Secondary
AA 02 S.14	—	Essaouira (Mogador)	117,095	31.30° N	09.48° W	Dar-el-Beida Secondary
AA 02 T.01	Canaria ^b	Las Palmas ^c	669,670	28.08° N	15.27° W	

Nation # 3: Côte d'Ivoire (Ivory Coast)

No bases

Nation # 4: Freeland

AA 04 C.1	Liberia	Monrovia	795,440	06.20° N	10.46° W	Freeland National HQ
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Nation # 5: Ghana, # 6: Guinée, & # 7: Haute-Volta (Upper Volta)

No bases

Nation # 8: Mali

AA 08 C.1	Tuareg	Gao	66,220	16.19° N	00.09° W	Mali National HQ
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Nation # 9: Mauritanie (Mauritania)

No bases

Nation # 10: Nigeria

AA 10 C.1	Benin	Cotonow	693,345	06.24° N	02.31° E	Nigeria National HQ
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Nation #11: Republic of Sénégal

AA 11 C.1	Yoff	Dakar ^d	3,111,500	14.38° N	17.27° W	Regional HQ, U.A. West & Pri.
AA 11 S.11	—	Saint-Louis	342,775	16.01° N	16.30° W	Dakar Secondary
AA 11 S.12	—	Banjul (Bathurst)	341,940	13.28° N	16.39° W	Dakar Secondary
AA 11 S.13	— (Guinée)	Bissau	277,215	11.52° N	15.39° W	Dakar Secondary
AA 11 S.14	— (Guinée)	Conakry	768,395	09.31° N	13.43° W	Dakar Secondary

Region B (Northeast)**Nation # 1: As-Sûdân (Sudan)**

AB 01 C.1	Sobat	Malakál	135,935	09.31° N	31.40° E	Int. HQ, As-Sûdân & Tchad
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Nation # 2: Bangházi

No bases, but AB 04 S.11 is located here.

a. Casablanca; all operatives (CC and otherwise) escaped before the depopulation. New HQ: Tanger (AA 02 S.11). New Primary: Essaouira (AA 02 S.14).

b. Canary Islands

c. Las Palmas de Gran Canaria

d. Also International HQ (Sénégal & Guinée)

U.A. Bases: Region B (Northeast), Lībiyā

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
Nation # 3: Lībiyā						
AB 03 C.1	Tripolitania	Al-Khūms	51,935	32.39° N	14.16° E	Int. HQ, Lībiyā & Tunisie
Nation #4: Miṣr (Arab Republic of Egypt)						
AB 04 C.1	Upper Egypt	Aswān ^a	562,380	24.05° N	32.56° E	Regional HQ, U.A. Northeast
AB 04 P.1	Beheira	<i>Al-Iskandariyah^b</i>	11,101,320	31.13° N	29.55° E	New Primary: AB 04 S.13
AB 04 S.11	— (Banghāzi)	Tubruq (Tobruk)	82,560	32.05° N	23.59° E	Al-Iskandariyah Secondary
AB 04 S.12	—	Matruh	68,175	31.21° N	27.15° E	Al-Iskandariyah Secondary
AB 04 S.13	Lower Egypt	Port Saïd	1,055,600	31.17° N	32.18° E	Al-Iskandariyah Secondary
AB 04 S.14	Upper Egypt	Hurghada	58,440	27.17° N	33.47° E	Al-Iskandariyah Secondary
Nation # 5: Somaliya						
AB 05 C.1	Mudug	Hobyo	43,280	05.20° N	48.30° E	Somaliya National HQ
Nation # 6: Tchad (Chad)						
AB 06 R.1	Kanem	Bol	1,300	13.27° N	14.40° E	Reports to AB 01 C.1
Nation # 7: Tunisie						
AB 07 R.1	—	none ^c	25	(variable)		Reports to AB 03 C.1
Nation # 8: Yaltopya (Ethiopia)						
No bases						

Region C (Central)**Nations # 1: Katanga (formerly southern Zaire) & # 2: Kenya**

No bases

Nation # 3: People's Republics of the Congo

AC 03 C.1	Estuaire, Gabon	Libreville	977,695	00.30° N	09.25° E	PRC National HQ
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Nation # 4: République centrafricaine (Central African Republic)

AC 04 C.1	Ombella-Mpoko	Bangui	728,400	04.23° N	18.37° E	Rép. centrafricaine Natl. HQ
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Nation # 5: São Tomé Islands

AC 05 C.1	Bioko (Fernando Póo)	Malabo (Santa Isabel)	107,560	03.45° N	08.48° E	São Tomé Islands National HQ
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Nation # 6: Tanzania

AC 06 C.1	Dar Es Salaam	Dar Es Salaam ^d	3,388,825	06.51° S	39.18° E	Supreme High Command, U.A.
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Nation # 7: Uganda

No bases

a. Also International HQ, Miṣr & Banghāzi

b. Alexandria; two Type-1 CC operatives were lost in combat.

c. The "Tsiborg" (local version of Cyborg) research team roves in the dry wastes of south Tunisia. The team members are in occasional contact with the 'Annaba (Algérie and Al-Khūms (Lībiyā) bases (AA 01 C.1 and AB 03 C.1, respectively).

d. Also Tanzania National HQ

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
Nation # 8: Zaïre						
AC 08 C.1	Kivu	Goma ^a	189,305	01.40° S	29.14° E	Regional HQ, U.A. Central
AC 08 T.01	Shaba	Moba (Baudouinville)	87,000	07.40° S	29.45° E	

Region D (South)

Nation # 1: Angola

AD 01 C.1	Bengo	Luanda ^b	1,851,500	08.50° S	13.15° E	Angola National HQ
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Nation # 2: Botswana

No bases

Nation # 3: Madagasikara

AD 03 C.1	—	Toamasina (Tamatave)	281,800	18.10° S	49.23° E	Madagasikara National HQ
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Nation # 4: Malawi

No bases

Nation # 5: Moçambique (Mozambique)

AD 05 C.1	Gaza	Maputo ^c	1,331,855	25.58° S	32.35° E	Moçambique National HQ
AD 05 T.01	Zambézia	Quelimane		17.53° S	36.51° E	

Nation # 6: Namibia

AD 06 C.1	Damaraland	Swakopmund	22,130	22.40° S	14.34° E	Namibia National HQ
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Nation # 7: Oranje-Vrystaat (Orange Free State) & # 8: South Atlantic States

No bases

Nation #9: Suid-Afrika (Republic of South Africa)

AD 09 C.1	Kaap	Kaapstad ^d	4,382,100	33.56° S	18.28° E	Regional HQ, U.A. South & Pri
AD 09 S.11	—	Port Nolloth	38,450	29.17° S	16.51° E	Kaapstad Secondary
AD 09 S.12	—	Oos-Londen ^e	740,090	33.00° S	27.54° E	Replaces AD 09 C.1 as Natl. HQ
AD 09 S.13	—	Knysna	54,530	34.03° S	23.03° E	Replaces AD 09 C.1 as Primary
AD 09 S.14	—	Voorbaai	48,185	34.09° S	22.06° E	Kaapstad Secondary

Nation # 10: Zambia

AD 10 C.1	Southern Zambia	Maramba (Livingstone)	311,620	17.50° S	25.53° E	Zambia National HQ
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Nation # 11: Zimbabwe (Rhodesia)

No bases

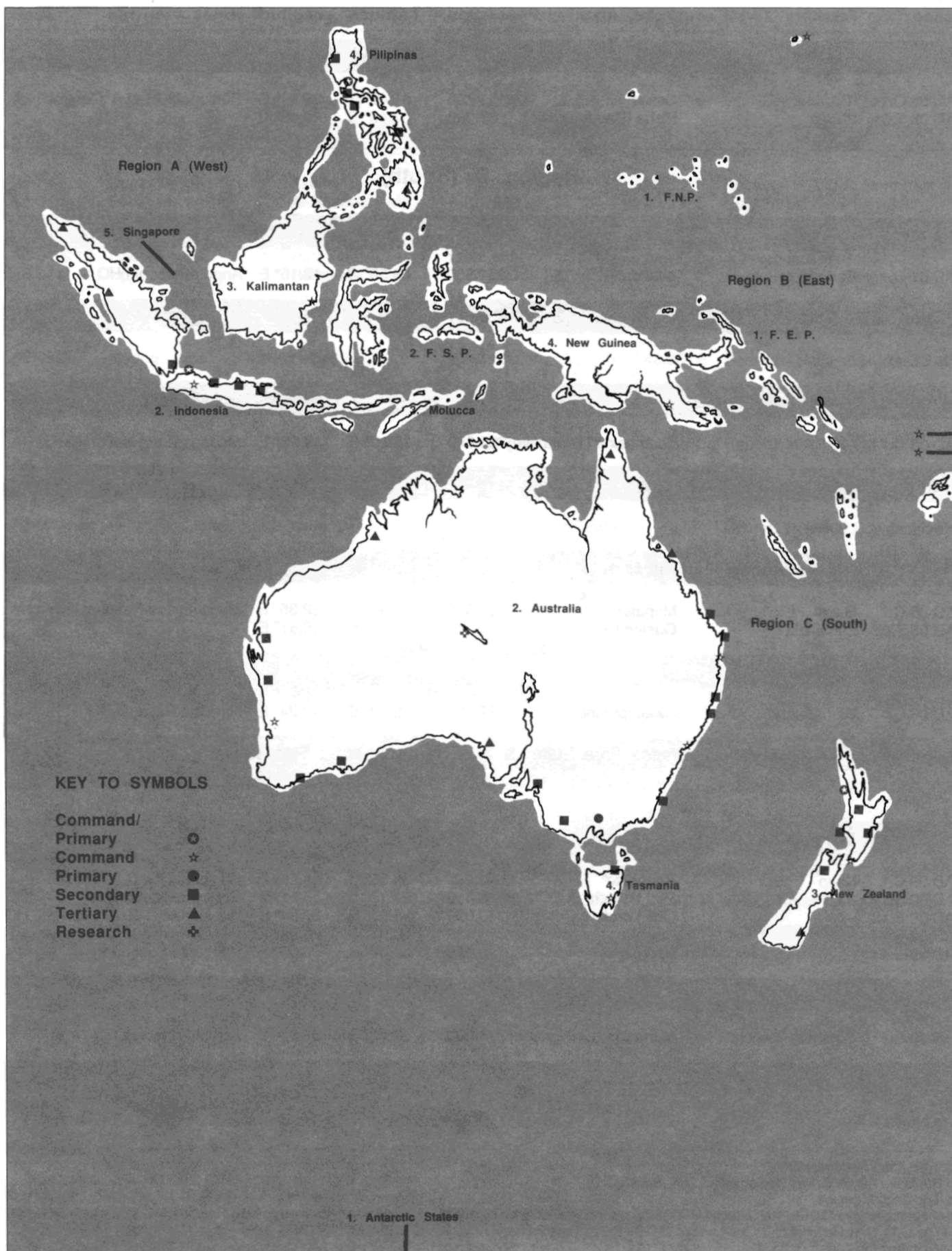
a. Also Zaïre National HQ

b Replaces AD 09 C.1 as Regional HQ, U.A. South.

c. Lourenço Marques

d. Capetown; also Suid-Afrika National HQ. All CC operatives escaped before the depopulation of that area. New Regional HQ: Luanda, Angola (AD 01 C.1). New National HQ: Oos-Londen (AD 09 S.12). New Primary: Knysna (AD 09 S.13).

e. East London



United Nations of Oceania

The U.N.O. has the fewest people and the lowest food production of all the blocs, and it is next to last in technology and total wealth. But it is nevertheless the most promising, dynamic, and fastest-growing of them all. It is the third largest bloc in land area (most of that in Australia and Antarctica), and the hard-working nature of Oceania's people has made them the second richest (per capita) in the world.

Sydney, Australia, is the capital. Oceania is divided into three regions by geography. The West is both dominated and handicapped by Indonesia, as that nation has one of the densest populations on the globe. The East is lackadaisical; the many small isles of the South Pacific are easily controlled by New Guinea. The South, the new frontier of the 21st century, is dominated by Australia.

The rise of Oceania was due to two principal factors. In the 1980s, tourist advertising by Australia produced incredible results. That, plus international pho-

bias about nuclear war and the threat of AIDS, prompted hundreds of thousands to immigrate from North America and Europe between 1990 and 2010. The second factor was the development of Antarctica; the U.N.O. created (and kept control of) the technology to insulate and move icebergs, and now sells them worldwide. As

pollution problems continue to spread, these may become the world's primary supply of fresh water.

In the key that begins on the next page, bases are listed in order under the nations to which they report. CC bases in italicized cities were lost during the depopulation of those metro areas.

CC Command Structure

National, International, and Sector HQ are listed under the Regional command bases to which they report. Primary bases are listed under the appropriate local commands. All secondary, tertiary, and research bases technically report directly to the local HQ. Bases destroyed in the invasion are marked with an asterisk. See the individual CC base listings in the Key to CC Bases for details on replacement bases.

Supreme High Command: Wellington, South Auckland, New Zealand (OC 03 C.2)

* **Region A (West) Command:** Bandung, Jawa, Republic of Indonesia (OA 02 C.1)

* Indonesia National HQ: Djakarta, Jawa (OA 02 P.1)

* Primary: Djakarta

* Pilipinas National HQ: Manila, Luzon (OA 04 C.1)

* Primary: Manila

Other National HQ: Kwajalein, Marshall Islands, Federation of Northwestern Polynesia; Balikpapan, Timur, Kalimantan.

Region B (East) Command: Port Moresby, New Guinea (OB 04 C.1)

No bases with CC staff.

National HQ: Papeete, Tahiti Island, Federation of Eastern Polynesia; Nadi, Fiji Island, Federation of Southwest Polynesia; Oekusi, Timor Island, Molucca; Port Moresby, Papua, New Guinea.

* **Region C (South) Command:** Sydney, New South Wales, Australia (OC 02 C.3)

* Australia Sector 1 (West) HQ: Perth, Western Australia (OC 02 C.1)

* Primary: Perth

* Australia Sector 2 (East) HQ: Brisbane, Queensland (OC 02 C.2)

* Primary: Brisbane (above)

* Primary: Melbourne, Victoria (OC 02 C.4)

New Zealand National HQ: Auckland, Central Auckland (OC 03 C.1)

Primary: Auckland

Other National HQ: Scott City, Antarctic States; Hobart, Tasmania.



CC Invasion Losses

Base	Metro area	Initial CC Staffing		CC Losses in Invasion		New CC Staffing	
		T-1	T-2	T-1	T-2	T-1	T-2
OA 02 P.1	<i>Djakarta</i>	3	1	2	0	1	1
OA 04 P.1	<i>Manila</i>	3	1	2	0	1	1
OC 02 P.1	<i>Perth</i>	3	1	1	0	2	1
OC 02 P.1	<i>Brisbane</i>	5	0	1	0	4	0
OC 02 P.2	<i>Melbourne</i>	3	1	3	1	0	0
OC 03 P.1	Auckland	3	1	0	0	3	1
		20	5	9	1	11	4

Key to U.N.O. CC Bases

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
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Region A (West)

Nation # 1: Federation of Northwestern Polynesia

OA 01 C.1	Marshall Islands	Kwajalein	52,465	09.15° N	167.30° E	F.N.W.P. National HQ
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Nation #2: Republic of Indonesia

OA 02 C.1	Jawa (Java)	Djakarta ^a	20,445,425	06.08° S	106.45° E	Indonesia National HQ & Pri.
OA 02 C.2	Jawa	Bandung	7,114,140	06.57° S	107.34° E	Regional HQ, U.N.O. West
OA 02 S.11	Sumatra	Tanjung.-Teluk. ^b	625,900	05.28° S	105.16° E	Djakarta Secondary
OA 02 S.12	Jawa	Tjirebon (Cirebon)	561,555	06.46° S	108.33° E	Djakarta Secondary
OA 02 S.13	Jawa	Semarang ^c	2,033,815	06.58° S	110.29° E	Replaces OA 02 C.1 as Pri. & HQ
OA 02 S.14	Jawa	Surabaya	9,212,900	07.14° S	112.45° E	
OA 02 T.01	Sumatra	Sigli	86,985	05.21° N	95.56° E	
OA 02 T.02	Sumatra	Padang	617,575	01.00° S	100.21° E	

Nation # 3: Kalimantan

OA 03 C.1	Timur	Balikpapan	431,995	01.15° S	116.50° E	Kalimantan National HQ
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Nation #4: Pilipinas (Republic of the Philippines)

OA 04 C.1	Luzon	Manila ^d	17,299,975	14.37° N	120.58° E	Pilipinas Natl. HQ & Primary
OA 04 S.11	Luzon	Lingayen	185,690	16.02° N	120.14° E	Manila Secondary
OA 04 S.12	Luzon	Batangas	394,325	13.46° N	121.01° E	Replaces OA 04 C.1 as Primary
OA 04 S.13	Mindoro	Calapan	174,915	13.23° N	121.10° E	Manila Secondary
OA 04 S.14	Leyte	Tacloban	253,860	11.15° N	125.01° E	Manila Secondary
OA 04 T.01	Mindanao	Davao	1,524,535	07.05° N	125.38° E	Replaces OA 04 C.1 as Natl. HQ

Nation #5: Singapore

No bases

Region B (East)

Nation # 1: Federation of Eastern Polynesia

OB 01 C.1	Tahiti	Papeete	132,110	17.32° S	149.34° W	F.E.P. National HQ
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Nation # 2: Federation of Southwest Polynesia

OB 02 C.1	Fiji	Nadi ^e	46,550	17.47° S	177.29° E	F.S.W.P. National HQ
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Nation # 3: Molucca

OB 03 C.1	Timor	Kupang	165,760	10.13° S	123.38° E	Molucca National HQ
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Nation # 4: New Guinea

OB 04 C.1	Papua	Port Moresby	335,300	09.30° S	147.07° E	Regional HQ, U.N.O. East
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- a. All CCs in Djakarta successfully evacuated before the depopulation of that region; two Type-1 CC operatives were lost in combat. New National HQ and Primary: Semarang (OA 02 S.13).
- b. Tanjungkarang-Telukbetung
- c. New National HQ and Primary, replacing Djakarta and Bandung.
- d. New National HQ: Davao (OA 04 T.01). New Primary: Batangas (OA 04 S.12).
- e. On Viti Levu

Base	Territory	Metro Area	Population	Latitude	Longitude	Notes
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Region C (South)**Nation # 1: Antarctic States**

OC 01 C.1	Polar Free Zone	Scott City	22,435	90.00° S	00.00° –	Antarctic States National HQ
OC 01 C.2	Sakharov	Vostok	8,210	78.27° S	106.51° E	formerly SSSR (P.A.U. A-4)
OC 01 R.01	Ross	<i>Russkaya</i>	1,740	74.46° S	136.51° W	formerly SSSR (P.A.U. A-4)
OC 01 R.02	Coats	Halley	635	75.31° S	26.56° W	formerly U.K. (E.C. A-9)
OC 01 R.03	Maud	Neumayer	820	70.37° S	08.22° W	formerly B.R.D. (E.C. B-2)
OC 01 R.04	Maud	Gangotri	2,295	70.05° S	12.00° E	formerly Bhārat (P.A.U. C-2)
OC 01 R.05	Enderby	Mizuho	3,450	70.42° S	44.20° E	formerly Japan (P.A.U. A-2)
OC 01 R.06	Enderby	Mawson	960	67.36° S	62.52° E	formerly Australia (U.N.O. C-2)
OC 01 R.07	Wilkes	Durville	1,820	66.40° S	140.01° E	formerly France (E.C. B-5)
OC 01 R.08	Ross	McMurdo	6,365	77.51° S	166.40° E	formerly U.S.A. (T.A.U. A-4)

Nation #2: Commonwealth of Australia

OC 02 C.1	Western Australia	<i>Perth^a</i>	5,430,120	31.58° S	115.49° E	HQ, Australia Sect. 1 (W) & Pri.
OC 02 C.2	Queensland	<i>Brisbane^b</i>	6,235,790	27.30° S	153.00° E	HQ, Australia Sect. 2 (E) & Pri.
OC 02 C.3	New South Wales	<i>Sydney^c</i>	19,624,270	33.55° S	151.10° E	Regional HQ, U.N.O. South
OC 02 P.3	Victoria	<i>Melbourne^d</i>	16,836,690	37.45° S	144.58° E	
OC 02 R.1	Northern Territory	Lake Amadeus ^e	165	24.72° S	130.92° E	
OC 02 S.11	Western Australia	Carnarvon	34,895	24.51° S	113.45° E	Perth Secondary
OC 02 S.12	Western Australia	Geraldton	75,865	28.49° S	114.36° E	Replaces OC 02 C.1 as Primary
OC 02 S.13	Western Australia	Esperance	61,375	33.49° S	121.52° E	Perth Secondary
OC 02 S.14	Western Australia	Albany	103,175	34.57° S	117.54° E	Replaces OC 02 C.1 as HQ, S 1
OC 02 S.21	Queensland	Gladstone	27,470	23.52° S	151.16° E	Brisbane Secondary
OC 02 S.22	Queensland	Maryborough ^f	31,650	25.32° S	152.36° E	Replaces OC 02 C.2 as Primary
OC 02 S.23	New South Wales	Coffs Harbour	7,290	30.18° S	153.08° E	Brisbane Secondary
OC 02 S.24	New South Wales	Port Macquarie	14,675	31.28° S	152.25° E	Brisbane Secondary
OC 02 S.31	South Australia	Victor Harbor	26,665	35.33° S	138.37° E	Melbourne Secondary
OC 02 S.32	New South Wales	Merimbula	22,395	37.18° S	146.08° E	Melbourne Secondary
OC 02 S.33	Victoria	Portland ^g	9,420	38.21° S	141.38° E	Melbourne Secondary
OC 02 S.34	– (Tasmania)	Burnie	29,845	41.03° S	143.55° E	Replaces OC 02 P.3
OC 02 T.01	Northern Territory	Darwin	286,715	12.23° S	130.44° E	
OC 02 T.02	Western Australia	Broome	51,180	17.58° S	122.15° E	
OC 02 T.03	South Australia	Ceduna	102,835	32.07° S	133.42° E	
OC 02 T.04	Queensland	Weipa	11,430	12.35° S	141.56° E	
OC 02 T.05	Queensland	Townsville	590,575	19.13° S	146.48° E	Replaces OC 02 C.2 as HQ, S 2

Nation #3: New Zealand

OC 03 C.1	Central Auckland	Auckland ^h	3,212,725	36.55° S	174.47° E	New Zealand National HQ
OC 03 C.2	South Auckland	Wellington	1,450,490	41.17° S	174.47° E	Supreme High Command
OC 03 S.11	South Auckland	Mt. Maunganui	48,905	37.38° S	176.12° E	North Island
OC 03 S.12	Taranki	New Plymouth	185,300	39.03° S	174.04° E	North Island
OC 03 S.13	Hawkes Bay	Napier	458,485	39.29° S	176.58° E	North Island
OC 03 S.14	Nelson	Motueka	66,750	41.08° S	173.01° E	South Island
OC 03 T.01	Otago	Dunedin	468,435	45.52° S	170.30° E	South Island

Nation # 4: Tasmania

OC 04 C.1	–	Hobart	705,550	42.54° S	147.18° E	Tasmania National HQ
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- a. All CC operatives evacuated Perth before the depopulation of that area. New Sector HQ: Albany (OC 02 S.14). New Primary: (OC 02 S.12).
- b. All CC operatives in Brisbane evacuated before the depopulation of that area. New Sector HQ: Townsville (OC 02 T.02). New Primary: Maryborough (OC 02 S.22).
- c. New Regional HQ: Auckland, New Zealand (OC 03 C.1).
- d. All CC operatives in Melbourne were lost during the depopulation of that area. New Primary: Burnie, Tasmania (OC 02 S.34).
- e. Lake Amadeus (with no nearby towns) is a body of salt water; the research base is located beneath the lake bottom.
- f. Do not confuse with Maryborough, Victoria (37.05° S, 143.47° E).
- g. Do not confuse with Portland, New South Wales (33.20° S, 150.00° E).
- h. On North Island. Replaces Sydney, Australia (OC 02 C.3) as Regional HQ, U.N.O. South. Invading forces did not strike any part of New Zealand in the initial invasion. It is believed that an error may have been made in the troop deployment. As a precaution, the base was immediately moved to a different building in the city.

Xenoborgs

Most of the alien invaders, and in fact all of the combat troops, are of this race. Because of their appearance, seemingly part metal and part organic, people called them Xenoborgs — xeno (strange) and borg (short for cyborg, or cybernetic organism). They were not, in fact, far wrong.

The Xenoborgs as a race are pawns of the Masters (see page 47), though they are not aware of this.

General Notes

Most of the alien invaders are of this race. A Xenoborg resembles a giant-sized version of the microscopic dust mite commonly found in households. This tiny terror, so small that an electron microscope is required to examine it accurately, feeds on the minute flakes of skin we shed in the course of a normal day. Its large alien look-alike, however, is more than 3 meters tall and wide, and about 4.5 meters long. Its six (or eight) small, spindly legs seem incapable of supporting the massive bloated body. However, since much of the creature's interior consists of spaces in which objects and gases are held, the 28.3 cubic meters (1,000 cubic feet) of body volume masses only about 250 kg (550 pounds). The creature's weight is often less than that — 204-227 kg (450-500 pounds) — since some of the gases carried within its form are lighter than air.

Xenoborg technology embodies relatively few principles unknown to Man, but it has enjoyed a longer period of development; the Empire has stood for millennia. Though the aliens do craft and use devices of various sorts, they do not rely primarily on inanimate objects as tools. Instead, they create genetically engineered beings to perform various tasks, because life forms provide maximum diversity and adaptability. Xenoborg transports for land, water, air, and space are creatures, genetically designed and grown for those specific purposes and outfitted with the appropriate devices. (See Teleborgs, page 48, for more details.)

During the invasion, however, most of the Xenoborg troops are not mounted. They can move rather quickly on land by adept use of their jointed legs. When confronted with special movement needs (such as aquatic), they simply "grow" holes to suck air or water into their bodies, as well as similar mechanisms to expel it,

providing directional propulsion of good speed and accuracy. They can even float (like dirigibles) by inflating themselves with hydrogen, if given a sufficient water source from which to extract the gas. (See Xenobiology, page 40, for the exact procedures involved.)

Game Data

Since the DVs, stats, and other details about Xenoborgs are often needed during games, the reference tables are located on the inner and outer back covers of this booklet, where you can most easily find and use them. The stats and IPs given are averages, and may vary by as much as $\pm 20\%$.

Most of the Xenoborgs encountered in the course of a CC game will be standard, low-ranking military types. Initially, no role-playing notes or special skills apply to these. The things act predictably, are usually hostile, and do not normally communicate with humans to any great extent. Once CCs are seen as a real threat, however, any Xenoborg may be willing to talk.

Leaders

Leader-type Xenoborgs often have knowledge of Skills. Apply the same skill system used for CC characters, but before assigning specific fields and areas, read "Xenoborgs as Beings" (page 44) to become familiar with the extraterrestrial viewpoint, and choose Skills accordingly.

Xenoborgs of the ranks of Sergeant or higher also have better scores (including Stats and IPs) than do Privates and Corporals. This is in part due to their larger size, summarized on the table below. (The numbers represent meters or yards.)

Xenoborg Sizes

Rank	Height	
	Length	& Width
Private & Corporal	4.5	3.1
Sergeant	4.9	3.2
Lieutenant	5.1	3.5
Captain	5.5	3.7
Major	5.9	4.1
Colonel	7.1	4.6
Brigadier	7.7	5.1
General	8.3	5.5

Defense Values (DVs)

Xenoborgs can consciously soften or harden selected body parts by varying the water content in the individual cells. (See Xenobiology for details.) Fully hydrated cells are soft, providing maximum flexibility and tactile sense; dehydrated cells are hard, affording better defense but less mobility. The harder the cells, the better resistance the creature has to most forms of attack. Xenoborg DVs thus vary by the state of the exterior cells (soft, natural, firm, or hard), and by the type and amount of special defenses used. As a general rule, more and better defenses (such as armor) are available as rank increases. These defenses may range from simple metallic body shields to sophisticated systems of types similar to those found in a CYBORG COMMANDO™ character.

Three tables on the inside back cover of this booklet give DVs by cell hardness for Xenoborgs of the ranks of Private, Corporal, Sergeant, and Lieutenant. Each DV on these tables may vary by ± 5 .

A fourth table gives the formula for calculating the special DVs for Xenoborg officers of higher ranks. To use this information, multiply the DV given in the rank description (indicated on the table with a # mark) by the percentage given on the table, and round up the result to the nearest whole number.

Add a +5 bonus to all DV scores given on any table if the Xenoborg is either personally inhabited by a Master or controlled by a Master's computer implant.

By deliberately softening areas of its body, a Xenoborg can change its shape, extruding or retracting appendages as desired. (See Xenobiology for details.) This is not normally done during combat or in potentially hazardous environments, but in the months after the invasion, characters may come upon an alien that is undergoing this process. In mid-change, the entire creature is soft. However, the more probable Xenoborg status in such an encounter is mostly natural (in the process of hardening its exterior), with some soft newly-created parts.

The hardness of Xenoborg body parts varies according to their intended functions. Except in special circumstances, the state of various Xenoborg body parts is as follows. Note that all appendages are optional, including heads, and few Xenoborgs have all the parts listed.

Body Areas

Body:	hard
Ear spot:	firm
Eye spot:	natural
Feeler:	soft
Foot:	hard
Head:	firm or hard
Interior:	soft
Joint (any):	natural
Leg:	firm
Mandibles:	hard
Pore:	natural
Spike:	hard
Tail:	firm
Tentacle:	natural
Wound:	soft +

Notes on Body Areas

Body: In Terran combat conditions, a Xenoborg normally maintains a hard exterior. Under water, the hardest possible is firm. In a safe environment, the creature relaxes to a firm or natural state.

Ear or eye spot: These patches of external skin cells appear slightly lighter in color than the surrounding area. Each performs the appropriate sensory function.

Feeler: This tentacle-like appendage extruded from a body opening is extremely hydrated for maximum tactile sensory input. Feelers often ooze a purplish slime.

Foot: Though a foot is hard, for durability, note that the leg is firm; no joint *per se* occurs between the two.

Head: Any appendage appearing to be a head is actually a decoy to attract attacks, and has little or no real function unless it wields mandibles. If merely a decoy, the head is usually hard. If equipped with attack modes, it is firm.

Interior: This is always kept in soft state, with cells ready to move about or manipulate devices carried.

Joint: Some hydration of cells is required for ease of movement. Joints occur only at the intersections of natural or hard areas (leg to body, occasionally mid-leg, arm to body, etc.)

Leg: Typically insectoid, these appendages may be jointed for speed and maneuverability, but are often not.

Mandibles: These clawlike pincers protruding from "mouths" are often toothed or sharply edged, but they are always hard.

Pore: A pore is a hole in the body from which a weapon or feeler protrudes. Since the weapon may be withdrawn back into the body, the pore is kept semi-soft, but once this occurs, the outer cells (natural) close over the pore.

Spike: Usually pointed, spikes may occur on any body surface, commonly on the body, tail, and/or tentacle.

Tail: This is actually a special form of tentacle, hardened and adorned by spikes on its sides and/or end.

Tentacle: A semi-soft unadorned appendage, this is often used for handling objects or victims. It may be of any length from 1-10 meters. If the appendage is intended for impact attacks, parts of it are usually dehydrated to natural or hard state.

Wound: Except in the special case of the "head" decoy, all wounds reveal the body interior, which is initially soft and remains so for 10 CT. As the exposed cells dehydrate, they are natural for another 10 CT, then firm for 10 CT before finally reaching hard state.

Use the body parts table and the DV value given on the table (inside back cover) to calculate the actual DV value for higher ranks.

Example: A flame thrower is fired at a Xenoborg Captain's tentacle. The given TDV on Table 1 is 45 (for hard), but a tentacle is natural (60%, given on Table 3), so the actual TDV is 27 ($45 \cdot 0.6$).

Equipment

Xenoborgs carry a variety of special weapons and other devices. To equip a Xenoborg, find its rank on Table 1, and note the communications (Comm) equipment and number of weapons carried. Then select specific weapons, up to the maximum noted within the categories indicated. (Fewer are possible.) Finally, add the Powwers required to supply those devices (see table on page 39).

If a Xenoborg with a Comm unit or Class 2 Weapon falls in combat, a reasonable effort will be made to retrieve that equipment. Class 1 weapons are only retrieved if such action is convenient.

Communications Devices

Each Xenoborg leader in the invasion force is equipped with a Comm unit, which it carries and uses entirely within its body. Specialized superhydrated cell groups deep inside the creature manipulate the controls, receive and translate incoming information, and produce signals for emission. Broadcasting antennae need not have exterior mountings, though devices for sensing the environment (such as an A-V camera, sensors, etc.) or for affecting it (such as infrared lights) must be brought to the exterior to be of much use, of course.

Power costs for the use of Comm units

are given. If the cost is noted as minimal, you need not keep track of it unless extensive Comm activity is expected. The devices listed below are cumulative; that is, each includes the functions of the all the items listed before it. For example, #2, the A-V Comm Unit, includes a Basic Comm Unit (#1) as well.

1. Basic Comm Unit

Power cost: minimal (1 PU per 10 signals)

This is a simple radio capable of sending and receiving signals on any of a wide variety of channels. It is omnidirectional — that is, the signals emanate in all directions — and easily overheard by terran receivers.

2. A-V Comm Unit

Power cost: minimal (1 PU per 5 signals)

This unit is essentially a simple television camera, receiver, and omnidirectional broadcaster.

3. Sensor

Power cost: minimal (1 PU per AT)

Similar to an optical camera with attached sensors, this E-M pickup detects much of the electromagnetic spectrum — x-rays, infrared light, ultraviolet, and microwaves. Lamps that produce a like range of emissions are included. The sensor also contains a motion detector, a sound detector sensitive to a wide range of frequencies and decibels, and a sound filtering device capable of removing extraneous noises from audio signals.

4. Laser Comm Unit (LasCom)

Power cost: 1 PU per signal sent

This device uses a standard combat laser (not included) to transmit a signal. The signal can only be translated by a receiver-decoder, which is included with the unit, and only if the beam strikes it. Effects which obscure the light beam (such as smoke) can affect the signal slightly, but usually not enough to ruin it. The beam can be aimed at and successfully received by an orbital Xenoborg Comm satellite. A LasCom compresses a signal by a factor of 1,000; for example, a detailed realtime record of a one-hour survey can be reported in 3.6 seconds.

5. ComPak

Power Cost: 10 PU per CT of signal

The most complex and expensive of the Xenoborg Comm units used by the

Xenoborgs: Armament

invading forces, the ComPak contains a small computer with sophisticated and specialized communications applications. Starting with a signal produced by any of the means given above, the computer can scramble it quite thoroughly, shift frequencies of transmission rapidly, code and decode messages, and so forth. It does all this in microseconds, and its output is generally understood only by another ComPak, or by an equally sophisticated computer using the proper programming. A ComPak can compress a signal by a factor of 10,000; for example, a detailed record of a full day's activity can be transmitted in 8.6 seconds (1 CT).

Armament

The limits herein apply only to devices. Every Xenoborg has body parts usable as weapons — claws, mandibles, spiked tail, etc. If an enemy presents no real threat (e.g. human civilians), devices will not normally be used; they are reserved for real dangers. CC characters do not appear as normal humans to Xenoborg sight; they are too tall, and they are detectably electrical in nature.

Weapons are grouped into three classes by their cost, rarity, and effect. Class 3 Armament, which includes major weapons such as anti-matter bombs, anti-personnel radiation bombs, and chemical or biological tools, can only be used after agreement by both Marshals (i.e. when their Masters decide it necessary).

Weapons List

Class 1	Class 2
Electromagnet	Electrostatic Generator
Grenade	E-M Beamer
Ignition System	Missile
Laser	Pulser

Weapon Descriptions

Electromagnet (Class: 1))

Power cost: 10 PU per CT
Range: 5
Damage: none

As much an all-purpose tool as a weapon, this device produces a powerful magnetic field. Though it has little effect on unarmed enemies, it can exert a strong pull on ferrous (iron-based) metals at a distance of 5 meters, and it is quite useful for disarming or immobilizing nearby opponents. The electromagnet can be turned on and off as quickly as desired. (Note that very few Xenoborg devices are metallic, and of those listed above, only the electrostatic generator and the missile are ferrous.)

Electrostatic Generator (Class: 2))

Power cost: 10 PU per charge
Range: 10 (to closest ground)
Damage: none (special)

Like the CC weapon of the same name, this device produces an electrical charge that will jump to the nearest ground. It inflicts no damage to life forms, but can scramble signals or destroy sensitive components of electrical circuitry.

E-M Beamer (Class: 2))

Power cost: 5 PU per shot
Range: 30
Damage: standard d10x (E-M)

This device produces intense radiation from transmitters and focuses it with a small parabolic cone. It can be used to project either X-rays or microwaves, but not both at once. The former has little immediate effect, but causes death within 72 hours from organ failures and a rapidly-growing form of cancer. Its beam can only be blocked by dense substances, such as lead. The microwaves have quick effect, frying the victim's interior within 1 CT, but can be blocked by even very thin metals.

Grenade (Class: 1))

Power cost: none
Range without launcher: 50
Range with launcher: 500
Damage (by type):
Explosive fragmentation: normal d10x (impact)
Gas, paralytic: stat check (neural) or paralysis 1-10 AT

Gas, poison: stat check (physical) or death
Smoke: none (obscures vision only)
Sonic: 10 fixed damage (sonic) and stat check (neural) or paralysis 1 CT (8.6 seconds)
White Phosphorus: two damages; normal d10x (thermal) and 10 fixed damage (impact)

Quite similar to a terrestrial grenade, this is a small spherical object which detonates either on impact or at a preset time after triggering. Grenades may be mechanical or electronic. Several types are available, including adhesive flammable material (white phosphorus), explosive fragmentation, gas (poison, paralytic, and otherwise), sonics (high-pitched noise painful to most terrestrial creatures), and smoke. A Xenoborg can accurately throw a grenade up to 50 meters by opening a pore in its surface and constricting specialized cell groups to expel the object. A mechanical launcher can increase the throwing range, but only 10% of the Xenoborgs with grenades are so equipped.

Ignition system (Class: 1))

Power cost: minimal (1 PU per 10 ignitions)
Normal jet:
Range: 10 meters
Damage: standard (d10x)
Intense jet:
Range: 2 meters
Damage: d10x +10 bonus

When a Xenoborg breaks water down into its components to gain oxygen, it can encyst the hydrogen within its cells. Given



a few hours' preparation, it can transfer this collected gas from the cell vacuoles into a central body cavity. With this ignition system added, the creature can expel the hydrogen in a flaming jet (maximum length 10 meters) through a valve and nozzle formed of specialized cells. Properly done, this destroys only a few such cells.

If other chemicals are carefully prepared and added, the jet can be intensified and focused to weld or cut through materials (maximum jet length 2 meters). However, this version is a very short-range weapon, and its use requires knowledge, special chemicals, and many hours of additional preparation. The proper combination of all these factors is only found in 10% of the Xenoborgs who have ignition systems in the first place.

Laser (Class 1)

Power cost: 5 PU per shot
Range: 1,000 (line of sight)
Damage: standard d10x

The Xenoborg standard combat laser works on the same principle as the common terran version, producing a beam of coherent light by appropriate stimulation of a corundum crystal. Xenoborg laser beams are usually green, emanating from a crystalline substance similar to emerald.

Missile (Class 2)

Power cost: none
Range (minimum): 30
Range (maximum): 5,000
Damages (2):
Impact: d10x +20 bonus
Thermal: d10x + 50 bonus

This is a miniaturized version of the terran missile, including a warhead payload of high explosive, and an internal guidance system that can be set for proximity, impact, heat-seeking, or other detonation mode. A small disposable launcher is included.

Pulser (Class 2)

Power cost: 5 PU per burst
Range: 300
Damage (per burst, by ammo):
Normal: fixed 25
Explosive: standard d10x

Similar to a terrestrial rifle, this device propels metal pellets through the barrel at very high speed by applying electromagnetic pulses at many points. The projectiles may be either solid or filled with explosive. Up to 50 bursts of ammunition are typically included. Only 20% of the Xenoborgs with pulsers have explosive ammunition.

Power Sources

Xenoborgs do not use chemical storage batteries as power sources; instead, they breed and use creatures, called Powwers, for the same purposes. (See Powwers, page 48, for more details.)

The actual numbers of Powwers required to run the various pieces of Xenoborg equipment are given on the table at right. Devices not listed do not normally require any Powwers for their exclusive use; instead they use minor amounts of electricity from some other Powwer carried. Note that the number given applies per device; for example, a Xenoborg with four lasers would carry eight Powwers to supply them. Powwers carried may be used in any manner desired, and are not restricted to those devices for which they were originally allocated.

Powwer supplies vary by the needs of the individual Xenoborgs, of course. At the start of the invasion, for example, each Xenoborg carries 3-5 times as many Powwers as indicated here.

Using Powwers

A Xenoborg carries its Powwers inside its body, where they can physically touch the devices that require power sources. By carefully stroking a Powwer, the Xenoborg causes the creature to emit a controlled amount of energy, typically 5 PU. Larger amounts are possible, up to the Powwer's maximum capacity of 100 PU, but the minimum produced is 1 PU. Keep track of the total PU available to a Xenoborg, not the totals for individual Powwers carried.

When a Powwer's stored electrical force has been expended, the creature is useless until recharged. A Powwer absorbs electromagnetic radiation, regaining power at the rate of 10 PU per hour's exposure to sunlight (or some other radi-

ant source). The creature must be in water while recharging, though the water may be of any type — fresh, salty, polluted, etc.

Powwer Allocations

Device	Number of Powwers
Comm unit	
Class 1	1
Class 2 or better	2
Armament	
Electromagnet	1
Electrostatic generator	2
E-M beamer	1
Laser	2
Pulser	1

Control by Masters

Masters are the beings controlling the Xenoborg invasion force. A Master resides within each Marshal at Command HQ, and six others occupy Generals. No Xenoborg personally inhabited by a Master will visit the Earth until the planet seems to be under control. This may occur from 2-6 months after the invasion, after stabilization but before the CC Force presents a real threat to the invaders.

The Masters' computers are implanted in many of the other Xenoborgs. These individuals are placed within the normal troop structure; many are involved (and some lost) in the initial combat. They provide a direct source of information to the Masters.

Xenoborgs controlled by the Masters have better attack capacity (+1 attack per cycle) and defense values (+5 bonus to each). To randomly determine whether an alien encountered is under the control of such a computer, check the percentage given in the last column of the table below for Xenoborgs of that rank.

Master-Controlled Xenoborgs

Rank	Original Number	% of rank Controlled	Losses	New Number	New % of rank Controlled	Random % Check
Sergeants	1,550	1	97	1453	1.1	1
Lieutenants	625	2	29	596	2.1	2
Captains	250	4	10	240	4.1	4
Majors	100	8	7	93	7.9	8
Colonels	40	16	2	38	16.1	16
Brigadiers	15	30	1	14	31.1	31
Generals*	6	60	0	6	60	60
Marshals*	2	100	0	2	100	100
Totals**	2,580	1.3	146	2,434	1.4	

*Both Marshals and 6 generals are occupied by Masters; none are computer-controlled

**Percentage of total is with respect to officers (including sergeants)

Xenobiology

...or Xenotomy, the study of strange structures — in this case, extraterrestrial.

The key to understanding Xenoborg development, abilities, and habits is understanding their cells. Xenoborgs are not organisms *per se*, as they have no organs. Their cells are hereafter referred to as X-cells.

General Notes

An X-cell is protein-based, composed entirely of elements found on Earth, in proportions remarkably similar to those in a terran cell, including the water content. The outer surface is smooth, without cilia or flagella. The cell functions in much the same way as the cell of a terran life form does, taking in nourishment and expelling waste.

Although an X-cell is amoeboid, capable of moving and eating by extending pseudopods, it always returns to its "natural" form when not involved in such pursuits. Every X-cell has one of two basic forms. The immature version (protocell, from the Greek *proto*-, meaning "first") has an elongated diamond shape (fig. 1). As the protocell grows, it changes in shape, becoming a regular pentagon (fig. 2). This mature X-cell (telocell, from the Greek *telo*- or *teleo*-, meaning "end") retains this form thereafter.

X-cells are easily visible to the naked human eye. The protocell is about 2 cm (1.6") long and 1.35 cm (0.53") wide. Each side of a telocell is about 2.3 cm (0.91") long, or 3.5 cm (1.38") across two points.

An X-cell is fairly acidic, having a pH value of 3.5 (7 being neutrality). Its normal

temperature is about 45° C (113° F), but it is quite poecilothermic, able to acclimate itself to a temperature $\pm 33\%$ of normal, or from about 25° to 65° C (77° to 149° F). Note that this is the actual cell temperature; an unprotected Xenoborg can function well within a wider range (est. 15-80° C, or 59-176° F). Temperature regulation is accomplished by air and/or water intake, circulation, and emission. With protective gear, the lower range can be considerably extended, down to about -30° C (-22° F).

Xenoborgs are quite sensitive to cold. In an environment below -29° C (-20° F), an unprotected Xenoborg takes 1 point of fixed damage per Phase for each 5 degrees below that temperature. Opponents attack forms using extremely cold substances, such as liquid nitrogen, may inflict either fixed or standard d10x damage to Xenoborgs.

Cell Structure

The structure of an X-cell is similar to that of a terran cell in that it contains many bodies which function in nearly identical ways. The following features are common to both cell types.

Membranes: The nuclear membrane surrounds the nucleus, and the unit membrane surrounds the entire cell. Each membrane has variable permeability and some limited ability to repair itself.

Cytoplasm: The material between the nuclear and unit membranes, in which particles, fluids, and organelles are suspended.

Organelles: These interior cell bodies perform various functions, as follows:

Centrioles function only during cell division.

Golgi bodies produce specific secretions.

Lysosomes perform digestive functions.

Mitochondria carry out respiratory functions.

Nucleus is the "commander" of the cell.

Ribosomes aid in synthesizing protein.

Vacuoles store, process, and/or transport materials (such as those to be digested).

Each terran cell has one nucleus; this is true for every life form on Earth. The one utterly extraterrestrial feature of an X-cell is the presence of and apparent cooperation between five nuclei, all distinctly different in composition and function. Two of these nuclei have functions that parallel those of a terran cell nucleus, though to a greater degree of complexity. The other three nuclei have functions not found in those of any terran life form.

The following X-cell nuclei have functions analogous to terran cell nuclei:

M-nucleus (metabolic; respiration & digestion): This nucleus controls organelles similar (and presumably analogous) to mitochondria, ribosomes, golgi bodies, and some lysosomes & vacuoles.

E-nucleus (excretory; waste grouping & elimination): This controls some lysosomes & vacuoles in a fashion similar (perhaps identical) to that of terran cells.

The X-cell nuclei with no terran analogs are as follows:

D-nucleus (dynamic; overall cell size & movement): Cell size is changed by varying the water content and/or the amount of cytoplasmic material, thereby altering the nucleocytoplasmic ratio. Cell movement is accomplished individually by pseudopod extension, or en masse as part of a cell group in motion.

S-nucleus (sensory; message sending, receiving, & translating): This is the key to Xenoborg intelligence, movement, and other unique activity. Information is conveyed from cell to cell by both

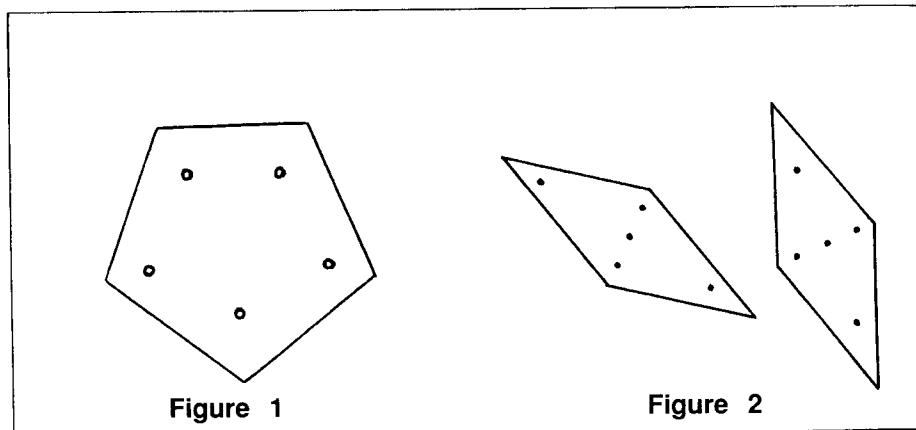


Figure 1

Figure 2

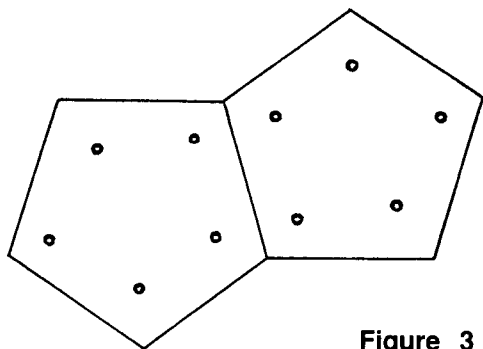


Figure 3

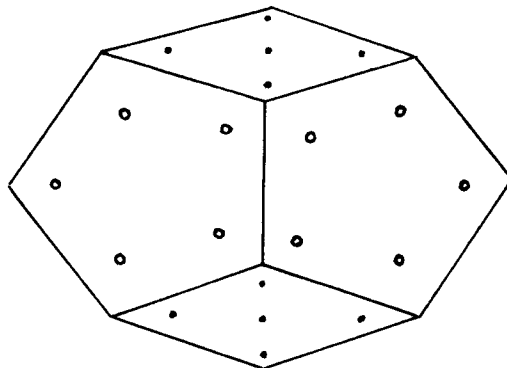


Figure 4

chemical and electrical means, the former involving minute changes in the chemical composition of the neighboring cells, and the latter minute changes in electrical charge, polarity, and other factors.

I-nucleus (information-storing; coding information into chemical form): This nucleus receives messages from the S-nucleus and then assembles extremely complex compounds, which are encased within a resilient protective material for long-term storage. The information coded into the compounds can later be accessed, replicated (preserving the original), and decoded by this nucleus.

Nuclear Cooperation

In a protocell, the S- and I-nuclei are fully functional, but the other nuclei are only partially so. This type of cell is thus very efficient at intercell communications, but needs assistance for its very survival, and can move itself only very slowly. It quickly bonds with telocells (see Development & Function, right) after its creation. By contrast, the S-nucleus becomes smaller as the cell ages, while the M- and E-nuclei enlarge slightly. All the nuclei except the sensory maintain a balance of

control, none being dominant.

Development & Function

As a terran zygote grows into a complete organism, many of its cells become specialized, forming various organs of the body. Thereafter, those cells are useless for any other purpose. By contrast, each cell of a Xenoborg's body is multi-functional. Groups of X-cells, incorporating both protocells and telocells, are often created for specific functions, and these functions may parallel those of organs in terran life forms. But such organization is temporary, and causes no change in the cells themselves.

Two telocells often pair to form a duplex cell (fig. 3). Thereafter, it is common for two protocells to bond to the sides, forming a four-cell unit called a tetrad (fig. 4). Tetrads often mesh tightly in matrix (tessellate) to form large surfaces (fig. 5). Sheets of tessellated X-cells form most of the Xenoborg's body.

Other cell groups, such as those in fig. 6, are created to perform specialized functions, including those carried out by the organs of terran life forms. Most such X-cell arrangements are, in fact, non-tessellating, and none are permanent. Xenoborgs thus have no fixed brain,

heart, stomach, or any other organs.

X-cells form many of these special groupings naturally, according to the instructions of some genetic analog within the cells, or in response to commands issued from other cells, but the Xenoborg may bring about the arrangements through conscious volition as well.

Cell groups whose functions are basically sensory, such as eyespots, are composed primarily of protocells, since they are best suited for such activity. In cell groups with little or no sensory function, such as legs, tails, or body weapons, telocells are predominant.

The means by which a Xenoborg exerts control over its individual cells is not completely clear, but it is obviously quite effective. Minute chemical and electrical changes in the cell membranes can pass information from cell to cell with very high speed. Alternately, some psychogenic means may be used, even though Xenoborgs have no psychogenic abilities per se, at least not as they are known to Man. Whatever the mechanism, the S- and D-nuclei are definitely involved.

Respiration

X-cells breathe, just as do cells of terran organisms. The method is very similar, except for the Xenoborgs' lack of a specialized processing organ like the terran lung. A fluid medium (air or water), taken into the Xenoborg body through any convenient orifice, is circulated so as to contact as many cells as possible. Oxygen is removed from the medium, absorbed, and used by the cell for various purposes. The water or air contacting the unit membrane also picks up various excretions of the cell at the same time. Many such excretions are nitrogenous, like those of terran cells.

Unlike terran life forms, Xenoborgs can take the oxygen they need directly from water on a cellular level. Water contacting the unit membrane of a cell flows into pinocytotic channels (the grooves between pseudopods), where it is "pinched off" and encysted in vacuoles. Hydrolytic enzymes break it down into hydrogen and oxygen; the latter is consumed, but the hydrogen is usually excreted. Sometimes, when the Xenoborg has a use for this flammable and lighter-than-air gas, the hydrogen is encysted in vacuoles and stored. The cells of a Xenoborg in "bloated" form typically contain many such vacuoles; in this state, the creature is almost identical in shape to the microscopic terran look-alike, the dust mite.

Other X-cell enzymes may react with impurities in the water or air absorbed, in attempts to gain sustenance (see Digestion, below). None of these enzymes are identical to those found in terran life forms, but the functions are similar. Note that a

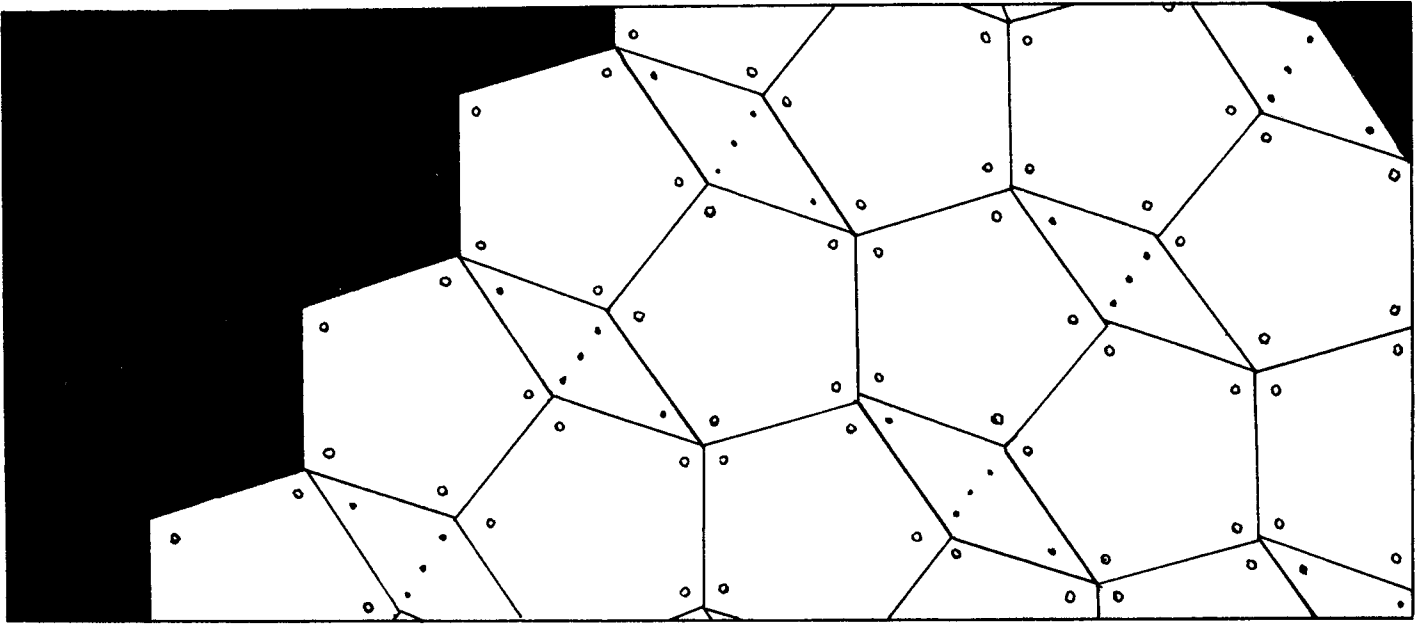


Figure 5

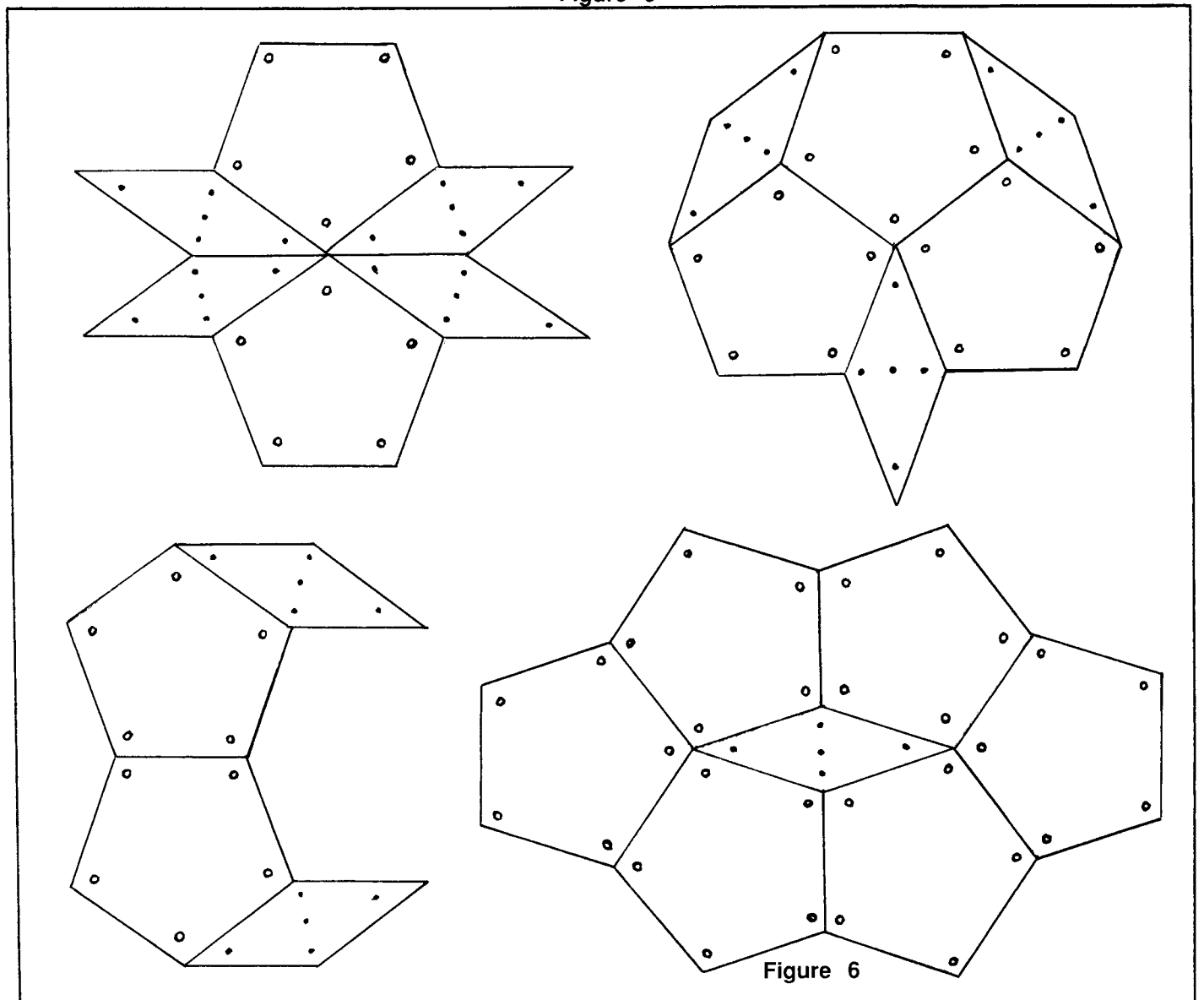


Figure 6

Xenoborg can consume salt water, as the unwanted components can be excreted, but the effort of coping with the alkalinity prevents the cells involved from participating in any other functions during this process.

Digestion

X-cells are able to derive sustenance from nearly any organic material, and their basic nutritional needs are very similar to those of their terran analogs. The more nutritious the material ingested, the less of it is needed, and vice versa. If a Xenoborg is forced to feed on soil, it must ingest large quantities of it (and, incidentally, expel most of it) to survive. If it has access to highly nutritious food sources, such as creatures high in a food chain (unfortunately including humans), relatively little is needed.

In a physical process similar to that used to circulate air or water, food sources are moved about within the Xenoborg form so as to contact as many cells as possible. Some cells excrete acidic substances which aid in the breakdown of the food source, and all the cells of the body benefit thereby. Individual cells employ phagocytosis, just as do terran cells, extending pseudopods to surround solid food particles.

As with terran cells, the individual X-cells cannot handle most raw foods. Once the particles are encysted in vacuoles, the M-nucleus emits proteolytic digestive enzymes to reduce the gross food source to digestible compounds, which are then transferred to other vacuoles for delivery to the nuclei or absorbed by the cytoplasm. It is very noteworthy that some enzymes from the M-nucleus can easily handle bacteria, viruses, and other biotic microorganisms which cause disease in Man. The Xenoborg thus never tolerates symbiots of any sort.

Given a nutritiously dense food, an inactive Xenoborg consumes about 5% of its body weight per day, or approximately 11.4 kg (25 pounds) for a typical specimen. A highly active creature may need as much as eight times that amount. Eating occurs every 12 hours, on the average. Lack of food does not cause pain or weakness, but simply results in a loss of mass, at a rate approximately equal to 40% of the food requirement — 4.5 kg (10 pounds) per day during inactivity, or 34-36 kg (75-80 pounds) per day for strenuous activity. As a Xenoborg loses mass, however, it also loses intelligence; a creature of 113-181 kg (250-400 pounds) is semi-intelligent at best, and it effectively becomes animalistic — irrational and ravenous — at any weight below that. In this condition, a Xenoborg can be extremely dangerous to any life form, though direct intercell com-

munications will convince it to stop eating another of its own kind before much damage is done.

Hydration

Several characteristics of the Xenoborg life form are based on its ability to control the water content of its cells, a function of the D-nucleus in each cell. X-cells with normal water content handle most of the body functions. Some cells are deliberately dehydrated to perform other functions, and some highly specialized functions (notably the tactile senses) are performed by superhydrated cells.

Partially dehydrated cell groups offer greater tensile and motive strength, performing functions analogous to muscle cells in terran organisms. With partial dehydration comes greater cell stability, though size changes and cell movement are correspondingly slower.

Cell groups dehydrated to a greater degree than the "motive" sort are sensitive to vibrations within part of the electromagnetic spectrum. These groups fulfill various sensory functions (q.v.), such as sight and hearing.

Fully dehydrated cells become quite stiff and rather uncommunicative with respect to others in the Xenoborg life form. Cells exposed to external air tend to assume this form naturally, through evaporation. Such cells are typically used only to form a rigid external protective surface, called the ectodermic layer. If the water content is reduced to an absolute minimum within the range permitting cellular survival, the hardness is equivalent to the mineral quartz (Mohs scale 7; compare to 6.5 for a steel knife or file). Cells in this condition are also highly resistant to extremes of heat and cold, though alkaline substances and salts can have notable effects. (See CC weaponry section in CCF Manual for details.)

Such cells also serve as insulation, resisting moderate electrical shocks quite efficiently. They do succumb to impacts of high force, however, as their brittleness (a function of the vertical instability of the cell matrix) results in fractures and some shedding under such stresses. But the gaps created thereby are minimal, and are quickly filled by soft replacement cells from the interior, which may be dehydrated by the Xenoborg's conscious volition, or allowed to harden naturally.

Immersion in water causes some slight softening of the hard ectodermic layer (to Mohs 3; compare to 2.5 for a human fingernail), but there is no further effect unless the Xenoborg desires it. The creature can also soften a given area without immersion, by exuding water from nearby inner cells. All exterior cells can be fully hydrated in about 10 minutes if immersed

in pure water, or in about 2-4 hours otherwise, varying by the pH factor and the amount and type of impurities. Note that salt water can be processed, but the effort of coping with and expelling the salts makes the cells unable to perform any other function simultaneously.

Cell Survival & Regeneration

An isolated X-cell of either type (protocell or telocell) cannot survive alone in any known terran conditions. However, a tetrad (or any group of equivalent or greater size) can survive independently for a considerable length of time. Given adequate food and water, such a cell group can reproduce and recreate an entire functional Xenoborg — albeit of small size, about 1 meter long (9 cubic feet total volume) and massing only about 8-10 kg (18-22 pounds) — in about 72 hours. However, the resulting creature is almost totally unintelligent, since the degree of sentience is a direct function of the being's overall mass (see Intelligence, below). It will do little more than try to eat everything in sight. If adequate sustenance is available, it can grow into a full-sized (15' long) Xenoborg in another 10 days.

X-Cell Life Cycle

In the course of normal life, X-cells die natural deaths and are replaced by new ones, just like cells in terran organisms. The procedure by which replacement cells are generated is apparently identical in both; no conscious or subconscious direction is needed. Protocells do not divide; they can only grow into telocells (changing from four- to five-sided in the process) or die. A telocell does not grow; it divides, creating two protocells, and in the process (mitosis) the cell nuclei replicate themselves. The mitotic period of a telocell is about 2 hours. Cells undergoing mitosis are quite busy with the process, and are not usable for any other functions.

The utter selflessness and dedication of the Xenoborgs, combined with their durable physical characteristics and advanced technology, thus puts Man in a very grim position. Indeed, the Empire took the Earth in a matter of days. But taking a thing and keeping it are quite different matters, as the Xenoborgs (and their Masters) will discover . . . thanks to the CYBORG COMMANDO Force.

For notes on Xenoborg military organization, see "Invasion" (page 56). For detailed information on the living beings they use as vessels and power supplies, see Teleborg and Powwer, respectively. For notes on Xenoborg activities and society, see the next section.

Xenoborgs as Beings

Since Xenoborgs have no organs that could be called brains or nerves, they lack the corresponding weaknesses of terran creatures. They have no blood, either, since individual cells take in sustenance directly, rather than through a medium. Damage to a Xenoborg's body results in critical effects only if some specialized cell group is destroyed, in which case the critical effects apply only to the function of that group. As opponents, Xenoborgs must simply be eroded to a point at which they cannot compensate quickly enough to function with any speed, then completely destroyed.

Intelligence

Due to the comparatively large size of X-cells, the number required to form neural pathways of a complexity equivalent to the human brain would fill several hundred (or more) cubic feet. One of the earliest

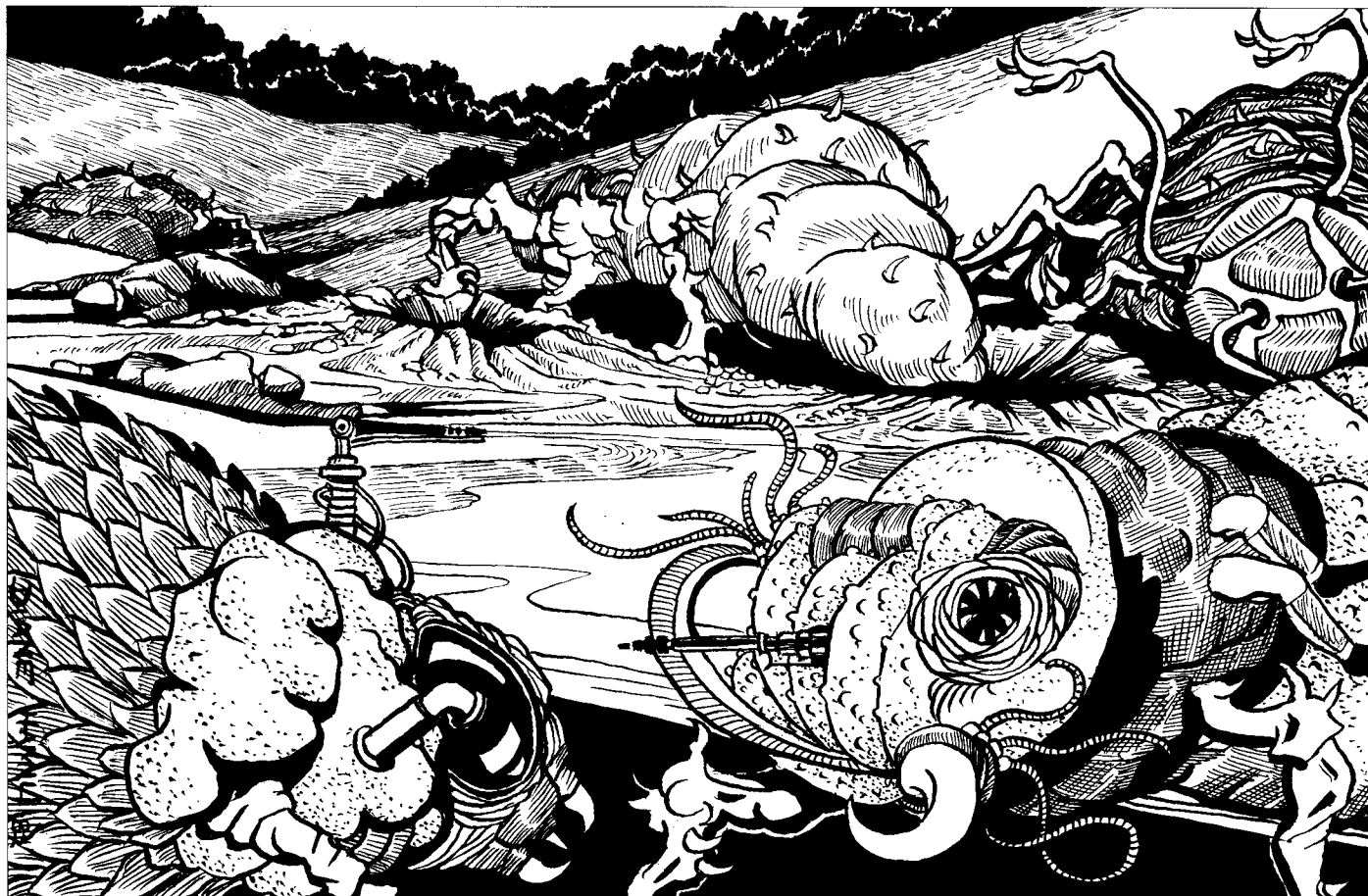
observed facts about Xenoborgs was their size — several hundred, perhaps a thousand cubic feet for a typical specimen. Humans thus decided rather quickly, once they became aware of the size of X-cells, that a Xenoborg had either no brain at all or an electronic equivalent.

In a very real sense, however, a Xenoborg's entire body is its brain. All X-cells not dedicated to specific functions take part in communications exchanges and interactions — thoughts which, though slower than human thoughts by an order of magnitude, are nevertheless just as effective and intelligent. Such communications between the cells are the primary function of the S-nuclei.

There are two types of Xenoborg memory: immediate and archived. Immediate memory is held in the neural path-equivalents formed by the body cells, and is accessible with the speed of Xenoborg thought. The speed of these "nerve impulses" varies from 10-80 meters per

second, despite the large size of the X-cells. Human nerves, by comparison, transmit such impulses at a speed of 0.6 to 120 meters per second. The apparent high efficiency of X-cell communication is probably due to the lack of synaptic jumps required for human nerve cell operation.

Archived memory requires 2-4 hours for retrieval. Memories of this type are coded into chemical compounds by the I-nuclei of the cells, then encysted in vacuoles physically near to that nucleus. Redundancy is common, to the extent that important memories may be duplicated in dozens of locations. The retrieval process is initiated voluntarily, and an I-nucleus which controls the desired memory subsequently duplicates the compounds and sends them to adjacent cells, where the process is repeated. As the information spreads, the memory gradually appears to the Xenoborg's consciousness, eventually reaching complete restoration. The creature slowly becomes aware of general



principles relevant to the information, and the gaps in the memory are filled as the data becomes more widespread, ultimately becoming "immediate memory."

Intelligence of terran life forms is partially a function of the number of neural pathways in an organism's brain. Xenoborg intelligence has a similar relationship to the number of usable X-cells in the body. Those cells which are devoted to specific functions, such as mitosis, exodermic protection, muscle-analog groups, and others, are unable to play a role in Xenoborg thought. Thus, at certain times Xenoborgs are complete idiots by any standard. Situations in which this commonly occurs include superdehydration (when a Xenoborg dehydrates most of its form to an extreme degree, becoming very compact and immune to most damage), memory-sharing (when one Xenoborg consumes another and immediately devotes its entire being to replicating itself — see Reproduction, next page), early growth stages (when most of the X-cells are busy with mitosis), attempts to eat or drink quickly, and attempts to process salt water on any large scale.

A direct corollary to this phenomenon is appropriate to combat situations: the intelligence of a Xenoborg decreases in proportion to its body mass. Simply put, the more you hit it, the stupider it gets.

Senses

Specialized X-cell groups can taste and smell (analyze solid, liquid, and gaseous matter) with accuracy somewhere between a CC's sampler and the comparatively limited ability of the human tongue, throat, and nose. Such sensory groups are slightly superhydrated, and consist mainly of protocells.

Superhydrated cell groups can also be formed into a sensitive tentacle. This can be extruded from a pore of the body and used for tactile sense, feeling textures and contours. The extreme superhydration produces high internal cell pressure, and some cell excretions pass through the membranes, occasionally dripping from the tentacle in the form of a purplish ooze. This material is not living, and quickly dries, but leaves a characteristic smear.

A Xenoborg can sense various electromagnetic radiations by using semi-dehydrated ("firm") cell groups, again mostly protocells. The detectable range is about 2,000 to 1,000,000 angstroms, or roughly middle ultraviolet to high infrared. Xenoborgs have little concept of color except as it relates to light absorption, reflection, and so forth. In darkness, they can "see" by employing a sonar effect, emitting intermittent hums or chirps; these may be from 100-50,000 Hz and of 10-100 Db in volume. Compare this to a typical human's



electronic music-reproduction system (stereo), which typically produces signals from 20-20,000 Hz, and to the human ear's thresholds of audible sound (4 Db) and pain (120 Db).

Communication

Specialized X-cell groups of a resilient formation (partially dehydrated) can be vibrated to produce wave movement of adjacent air or water. Other similar groups can receive such vibrations, which are in turn translated by the intelligence of the being. The range of possible frequencies is wide (see paragraph above), and the mechanics of Xenoborg speech are thus complex — as are the grammar and syntax, due to the high intelligence of the mature specimens.

When the I-nucleus encodes and encysts information as complex compounds, that material can be replicated and passed to a neighboring cell. This is integral to the process of retrieving archived memory. However, the material can also be passed to other cells along with specific "instructions" from the S-nucleus of the originating cell to handle it in a quite different manner. When this process is initiated, the recipient cells devote themselves to reproduction, and soon a cluster of cells is formed

with the sole purpose of holding that archived knowledge. Encysted food is also placed in the cells of this "carrier" group. The I-nucleus of each cell within this cluster becomes dominant. The M- and E-nuclei remain functional, though they are completely under the control of the I-nucleus; the other two nuclei become dormant. The Xenoborg can then expel this entire cell group from its body. The cluster is gooey at first, but soon dehydrates to resemble a smooth light-blue stone, with faint lines indicating the cell boundaries.

This material is called "memory food." Because of the instructions contained in the dominant I-nucleus, the cluster will neither seek outside sustenance nor attempt to reproduce, as small independent groups of X-cells normally do. Instead, it survives on the stored foods within the individual cells, which are adequate for several years of survival.

When this memory food is consumed by another Xenoborg, the information and memories contained therein are transferred intact. By taking just a bit longer in the process, the creature ingesting the cluster can merely replicate a few of the cells containing the information, leaving the original memory food intact. An immature Xenoborg will, however, simply consume the memory food, ignoring and destroying the knowledge it contains.

Memory foods are often organized, cultured, and kept by custodians of a memory bank. Such banks are widespread on the Xenoborgs' home planet. Others are cultivated at all new colonies, updated as often as possible with new material from home and other regions.

Polymorphism

Once all of a Xenoborg's exterior cells are fully relaxed by normal or high water content, the creature can rearrange its overall cell structure as desired, within certain limitations. In the process, it can literally grow as many appendages as it wants, of any specialized or general type. Upon assuming a new form, the Xenoborg simply dehydrates the exterior cells to produce the degree of protection desired.

The dexterity of individual appendages is a function of the degree of hydration, within the restrictions of cell size. A Xenoborg appendage in the shape of a human hand, for example, would have to be at least 8 to 10 times the size of a human's (due to cell size) and superhydrated if flexibility were desired. It would thus be quite vulnerable to damage.

As a result of this shape-alteration ability, most of the invading Xenoborg troops have specialized body parts. Appendages may be wholly or partially blunt for crushing, jagged for rending, or sharp for stabbing or cutting. Possible forms



take in up to ten times those amounts in a single "meal" and encyst most of it for later use. A fully prepared Xenoborg may thus be able to survive for as long as five terran days without any sustenance whatsoever, and suffering no ill effects therefrom.

Xenoborgs usually prefer to catch and eat living food sources by producing extra legs (for greater speed) and long tentacles. Not only do living creatures taste better, being fresh, but they offer a bit of sport in the process. Food beasts of convenient size (5-8 kg) are bred for release on planets firmly under Xenoborg control. These unintelligent little creatures are genetically designed to convert vegetation of the area in which they are to be placed into the densest possible concentrations of protein.

When food-beasts are unavailable, as is the case during most planetary invasions, Xenoborgs catch and feed on local life forms. Since a Xenoborg in combat conditions has selected its appendages for considerations other than food gathering, it is usually forced to capture its food using whatever weapons are available.

Once it has caught its prey, the Xenoborg simply draws the food into its body by any expedient means. It then moves the mass carefully about within itself, so that every cell comes into direct contact with the food. The individual cells take in the small amounts of material they need for survival.

Reproduction

A Xenoborg can reproduce itself alone, simply by splitting into two parts. Each half must spend considerable time growing thereafter, and both will be idiots studying to be morons until a reasonable mass is reached. Even so, these immature creatures are only semi-intelligent until they grow to full size. Education is another factor, as all immediate memory is lost in the process of reproduction. Memory food and self-encysted knowledge can offset much of the loss.

However, the Xenoborg race has a different custom for reproduction. Two of the creatures customarily discuss the matter, and one agrees to be eaten by the other. The resultant large body mass then splits into three reasonably large, semi-intelligent Xenoborgs, which quickly grow to full size.

The main advantages to this custom are the sharing of memory and knowledge, plus the minor variations that occasionally occur through natural mutation. On the Xenoborgs' home planet, returning explorers and soldiers are routinely eaten under controlled circumstances. The resulting beings are carefully examined for changes, then interrogated for new knowledge. If a mutation or new piece of knowl-

edge that could adversely affect the Empire is present, the individuals are destroyed, and a determined effort is made to locate and destroy all other Xenoborgs carrying the taint. But if beneficial mutations or knowledge are present, they are spread deliberately. If the Emperor (see right) decides that a specific fact should be known to the entire race (a rare event but not unprecedented), the knowledge can be spread throughout the Empire within about ten years, using memory food and other tools.

The Xenoborg Culture

The Xenoborg race is led by an Emperor, a single entity of vast size — about that of a large building, roughly 450,000 cubic feet. The Emperor's vast number of body cells permits a phenomenal amount of immediate memory and amazing intelligence. The Emperor is assisted by five aides of very large size, each of whom is in turn served by five more slightly smaller Xenoborgs, and so forth. The first echelon below the Emperor is generally called the Council. The Emperor delegates many minor matters for that group's attention, reserving its own thoughts for complex matters.

The Emperor and the Council members are all inhabited by Masters (q.v.), but are not aware of that fact. To a larger perspective, the entire Xenoborg Empire is merely one of several tools the Masters employ, but that discussion is beyond the scope of this game.

The philosophy of the entire Xenoborg race is one of unity and total dedication to the Empire. Each creature is essentially identical to all others, and this concept is reinforced by various social customs. Individuality per se is counterproductive and evil, but individual Xenoborgs do specialize in various branches of knowledge or service, as the Empire (i.e. the Emperor and/or the Council) deems best. The Xenoborgs pity the underdeveloped, chaotic races they encounter that lack such unity, and who suffer under the delusion of freedom.

The utter selflessness and dedication of the Xenoborgs, combined with their durable physical characteristics and advanced technology, thus puts Man in a very grim position. Indeed, the Empire, already a formidable galactic power, took the Earth in a matter of days. But taking a thing and keeping it are quite different matters, as the Xenoborgs (and their Masters) will discover . . . thanks to the CYBORG COMMANDO Force.

For notes on Xenoborg military organization, see "Invasion" (page 56). For notes on the living beings they use as vessels and power supplies, see "Teleborg" and "Powwer," respectively.

include heads, mandibles, toothed (otherwise non-functional) mouths, tentacles, tails, legs of various shapes, sizes, and number, and so forth — literally anything they (or you) can imagine. The sharpest edge achievable, due to cell size, is approximately that of a blunt butter knife; but a totally dehydrated protocell forms an adequately pointed tip for the end of a spike, about equal to that of a screwdriver.

Xenoborgs often produce appendages with human psychology firmly in mind. Since they have a superficial resemblance to bugs, they often produce head-shaped protruberances, even though they have no real need for them. During the invasion, heads composed of cells that had been allowed to die off served quite well as decoys, drawing fire away from the living body mass. Heads composed of living cells could also be used to display mandibles, teeth, etc., for horror effect.

Feeding

As previously noted, a typical Xenoborg tends to eat once every 12 hours, consuming about 6 kg (13 pounds) of nutritionally dense food each time. It also takes in a small amount of water (roughly 620 gm, or 22 ounces) in the same period. In adverse conditions, a Xenoborg will

Other Aliens

Although most details about the alien invaders are not known to Man in the initial year of the post-invasion game (i.e. 2035), much information will be acquired during the course of play. By late 2038, the CCs will amass enough data to make possible an organized assault on the invaders, and success in driving them from the Earth.

But as Game Master, you must of course have adequate knowledge of the aliens. Five basic types are involved:

- Masters (who control everything)
- Powers (who store and emit electrical power for general use)
- Teleborgs (the living vessels in which all others travel)
- Xenoborgs (most of the invading troops)
- Bugborgs (or buglies; specialized troops who resemble giant versions of terran insects, rare in the initial invasion but widely used later)

Very little information about Bugborgs is given in this set. They comprise the aliens' major response to the rise of the CC Force, arriving about 8-12 months after the invasion. Details about the various extraterrestrials (other than the Xenoborgs) involved in the initial assault are presented hereafter in alphabetical order.

Masters

The entire invasion is controlled, directly or indirectly, by one "master race," the existence of which is not initially known to Man. Members of this race call themselves a term meaning "controllers of reality" in their own language, but to the commanders of the invasion force, they are simply "the Masters."

A Master is a wormlike creature with tri-lateral symmetry. An adult's smooth, tapering body is 61 cm (2') long, 15 cm (6") wide at its thickest (uppermost) point, and topped by a bulbous head about 31 cm (1') in diameter. Three sucker-like mouths and three eyes are evenly spaced around the head, and eighteen small tentacles protrude from the body, again evenly spaced and symmetrically located. The creature's body masses about 41 kg (90 pounds), and has a total volume of 27,000 cc (1,650 cubic inches).

A Master can move on land or through water by oscillating its body in a fashion similar to certain terran snakes, aided by

its tentacles. However, it prefers to live in a host, from which the mouths draw off small amounts of body fluids, providing the Master with both food and oxygen. A Master can survive for weeks without food, or for about 20 hours without air. It has an average lifespan of approximately 400 years, but it can live to twice that age under ideal conditions.

Masters are hermaphroditic and can thus reproduce singly, though their customs include a ritual gene pooling through normal sexual activity. In either case, a single embryo is carried within the parent's body in a manner similar to the reproductive cycles of terran mammals, except that the gestation period is about four years. During the latter half of the pregnancy, the parent educates the fetus via psychogenics. At birth, the physically immature Master is a tenth the size of the adult and appears furry because of the thousands of small tentacles covering its body, but it is already fully mature mentally. The infant is able to survive alone within a few hours, and given sufficient nutrients, it will reach adult size within one year. During this time, most of the tiny tentacles dry up and fall off, except for eighteen that grow longer and stronger.

Incredibly intelligent by human standards, Masters are also skilled in psychogenics, and they rely on this ability to manipulate their environment and other beings. They prefer to retain anonymity in the process, surreptitiously controlling important members of other intelligent races. The Masters' ultimate goal is nothing less than Universal government by those with the greatest intellect, i.e. themselves. At the appropriate times, the Masters incline their victims' thoughts and actions toward that objective. Masters instigated, planned, and now control the entire invasion of Earth through the Xenoborgs, though the latter are unaware of that fact.

In addition to their use of psychogenics, the Masters can exert direct control over other races by either of two means. The more common is an implanted device either in place of or in control of the brain (or equivalent) of the subject. This device closely resembles the MadMac computer used in the Cyborg Commando Force, but there is one crucial difference in its method of operation: the computer, not the organic brain, has control. These devices were designed by the Masters, but created by one of their subjugated races (not one of those involved in this invasion).

The second and much rarer method of control is for a Master to physically enter and dwell within the body of another being. Once inside, the Master usually assumes complete control of the body by commanding the nervous system (or equivalent) of the victim. The Master may choose not to do this, and might merely reside within a body cavity. The usual purpose of such actions is camouflage and/or transportation. If the process of entering the victim causes some damage that the Master wants to conceal, it accelerates and directs the victim's natural healing processes to accomplish this. The victim usually remains entirely unaware of the Master's presence within.

Master (without host)	
Stats	
Mental	110
Neural	75
Physical	15
Psychonic Score	500
Move rate	5
Attacks per Cycle	1
Defenses (DVs)	
Laser	15
Impact	10
Thermal	30
E-M	60
Sonic	25
Integrity Points (IPs)	
basic game:	30
advanced game	
Head:	27
Body:	18
Skills	
300. Dynamic Psychogenics	
310. Matter (all areas)	50
320. Energy (all areas) ^a	70
330. Beings (all areas) ^b	90
400. Communications	
460. Psychogenics (all)	90
a. Includes heat, light, & molecular energy.	
b. Extraterrestrials only; thoughts of individuals, societies, & animals.	

Powwers

Though Teleborgs are equipped with power sources very similar to terran batteries, individual Xenoborgs carry no chemical reactors of that sort. Their power sources are creatures, known by a name which translates best as "Powwers."

A Powwer is part plant, part animal. It has no eyes, ears, mouth, nor any other visible openings in its surface. The volume of an adult ranges from 21-42 liters (0.75 to 1.5 cubic feet), with a mass of 9-18 kg (20-40 lb). A Powwer has no fixed shape. It often appears as a featureless asymmetrical blob, but it can change slowly to any convenient form. Its skin is a dull silvery color.

Powwers have animal intelligence at best, often less. They feed on (and are opaque to) electromagnetic radiations of a wide spectrum, absorbing wavelengths from 0.01 Å to 0.2 micrometer (gamma rays, X-rays, ultraviolet light, and visible light of high frequency). Radiations of larger wavelengths, including intense microwaves, are simply reflected. A Powwer also needs water for survival, plus traces of certain heavy metallic elements.

Similar in principle (though not in practice) to Earth's electric eel, a Powwer stores energy and releases it by conscious volition. The organs that store a Powwer's electrical potential are completely different from those in any terran life form, and are far more efficient. An adult Powwer can store 100 power units (PU) of force; an immature one can store 50 PU, and an exceptionally old and large specimen may store as much as 130 PU.

If carefully stroked and prodded in a certain way, a Powwer will emit an electrical impulse, the intensity of which is controllable under those circumstances. Xenoborgs, being the genetic engineers of the creatures, are very familiar with this technique. If a Powwer is in physical contact with a mechanism when the electricity is released, that current is channeled into the device. Most Xenoborg troops thus carry a number of Powwers within their bodies to supply electricity for weapons and communications units.

If touched by an unfamiliar being or object, a Powwer releases 1-10 PU of electricity, automatically hitting the offender and inflicting that amount of damage. (Treat as an automatic hit, ignoring DVs, and roll 1d10 for damage.) If struck, a Powwer may release 1-100 power units. (Roll d10x normally for the attack, comparing against the attacker's E-M DV). In practice, no one but a Xenoborg can safely handle a Powwer, unless psychogenic means are used to dupe it. Skill area 330 (dynamic psychogenic effects on beings) is applicable, if the user specifies the intent properly. Powwers are inoffen-

sive if undisturbed.

Once a Powwer has completely discharged its stored electricity, it is relatively useless until recharged, though it can live several weeks in this state. If placed in pure water and exposed to Earth's sunlight, it recharges its full 100 PU potential in a normal day (about 10 hours, but with maximum radiation absorption at noon, and minimal absorption during the periods near dawn and dusk). In this idyllic state, it spreads itself out to present a maximum amount of surface area to the incoming radiation. If struck by an electromagnetic attack form that falls within its absorption spectrum, a Powwer will regenerate an amount of electricity (in PU) equal to the power used to produce that attack. The

Powwer	
Stats	
Mental	1
Neural	8
Physical	15
Move rate	1
Attacks per Cycle	0 ^a
Defense Values (DV's)	
Laser	60
Impact	20
Thermal	30
E-M ^b	100
Sonic	10
Integrity Points (IP's)	
basic game	30
advanced game	
Critical areas ^c	9
Other areas	36
a. Unless touched or struck	
b. May absorb some	
c. About 20% of the creature's body mass is critical organs (hit 1-2 on 1d10); hits in other areas have little effect.	

d10x roll in this case determines only the hit probability, damage being irrelevant.

Teleborgs

Like Powwers, Teleborgs were genetically designed and created by Xenoborgs. But while Powwers have a specific, limited purpose, Teleborgs are multi-purpose creatures with many abilities. Generally, they are the mounts on (and occasionally in) which Xenoborgs travel, not only on land, but also through water, air — and even space. Teleborgs can thus be divided into four basic categories according to their use. Most of the Teleborgs used in the invasion are of spacegoing type.

A Teleborg is part plant, part animal. It is semi-intelligent, and can survive unguarded and untended, assuming adequate food sources. Whatever its form, state, or age, each Teleborg consists of a central body mass with several projecting parts. The latter range from very soft appendages, such as tentacles, to extremely hard ones, such as spikes. The creature's cells are much like those of Xenoborgs; there are no specific organs in the body. Each Teleborg exerts control over its individual cells, though not to the degree exhibited by its remarkable creators. Several natural body openings serve for the intake of food and water, waste emission, senses, tentacle production, and so forth. With maturity and education, the creature can learn to close these pores tightly, so that it presents no obvious points of weakness or entry in combat situations. It is also typically equipped and armored for specific uses.

Reproduction is accomplished by budding. Weight at birth is about 50 kg (110 lb) within a volume of 57 liters (2 cubic feet), but the creature quickly grows to full size if sufficient nutrients are available. That density, about 877 grams per liter (55 pounds per cubic foot), is maintained by all the specie of this race, whatever their eventual sizes and shapes. These latter factors are genetically predetermined,



varying according to the creature's intended use.

The larger Teleborg mounts are designed such that one or more Xenoborgs may choose to ride within them. In such cases, the "driver" may peer out from its pores or communicate directly with the creature's limited intelligence to navigate.

Transport Teleborgs

A Teleborg designed as a land mount resembles a huge twenty-legged centipede, nearly 18 meters long and 3 meters tall and wide. Very few of these are involved in the invasion. They resemble giant versions of terran centipedes, with ten pairs of short legs on an elongated (15 meter) body, though they are not segmented. They are quite efficient in rugged, broken terrain. Each can carry two or three passengers of typical Xenoborg size.

Two distinct types of Teleborgs are used for negotiating fluid bodies, such as lakes or seas. One, which appears similar to a six-legged water spider with very broad webbed feet, is capable of walking on water unless heavily laden. Its body is a mere 7 meters long and about 5 meters in diameter, tapering at the ends. The subsurface Teleborg is much different. Very similar to its space-going cousin (q.v.), it has the same general proportions, but on a smaller scale, its dimensions being about 80% of those of the smallest variety. Both water-type Teleborgs are able to move by taking water in through pores and expelling it directionally through short tube-like tentacles.

A Teleborg for aerial transport is large, with three pairs of wings (each 55 meters across) and four narrow but strong legs supporting a body that is 23 meters long, 8 meters wide, and 5 meters thick. Two long, thin, whip-like tentacles protrude from the front of the body, and fins (stabilizers) appear at three equilateral points near the rear. Aerial transports are usually armored for defense, with protective materials varying widely from light shiny cloth to thick, heavy metallic coverings.

Only a few hundred (total) land, water, and aerial Teleborgs accompany the Xenoborg forces, and most of those are reserved for special needs. The most common Teleborg found on or near Earth after the invasion is the spacegoing type, of which about 4,000 were grown for combat use. Each such creature can hold from 5 to 150 fully grown Xenoborgs within it. During the deployment of the Xenoborgs' First Army, the larger Teleborgs were filled beyond their normal capacity, carrying both regular troops and dozens of superdehydrated (and thus very compact) Xenoborgs destined for ejection over suitable bodies of fresh water in the selected combat zones.

General Data, Transport Teleborgs

	Land	Surface Water	Under Water	Air
Stats				
Mental	5	5	7	10
Neural	16	14	20	29
Physical	325	225	550	1,850
Move rate	10	30	20	100
Attacks per Cycle	1	1	2	2
Defense Values (DVs)^a				
Laser	20	20	20	30
Impact	30	20	25	35
Thermal	25	30	35	25
E-M	15	15	15	15
Sonic	10	10	10	10
Integrity Points (IPs)				
basic game	650	450	1,100	3,700
advanced game				
Body	775	585	1,500	4,750
Leg (each) ^b	10	15	-	25
Tentacle (each) ^c	-	-	15	50
Wing (each) ^d	-	-	-	100
Hit Locations (1d10)				
	1-2 leg 3-10 body	1-3 leg 4-10 body	1 tentacle 2-10 body	1 leg 2-5 wing 6-10 body
a. DVs: assumes combat conditions; also see text for variations by exterior hardness. b. legs: 20 for land type, 6 for surface water type, 4 for air type. c. tentacles: 10 for subsurface water type, 2 for air type. d. wings (6, on air-type only): damage only slows maximum speed until any 3 wings are completely destroyed, which makes continued flight impossible (causing immediate falling if airborne).				

Space Teleborgs

A Teleborg grown for space flight is similar in shape to one of Earth's classic "flying saucers" (or more accurately, one table saucer inverted and placed upon another), but with several living and mechanical appendages. Its diameter is about four times the thickness of the center. The smallest of these creatures is 16 meters across and 4 meters thick at the center. The dimensions of the largest are about four times those of the smallest.

Each spacegoing Teleborg is heavily armed, equipped with fuel tanks and propulsion units, and armored against both the severity of hard vacuum and the attack modes of the enemy.

The two primary drive systems are a reaction drive and a fluid manipulator. The first is quite similar to Earth devices. Liquid oxygen and explosive fuel are mixed with-

in a reaction chamber, and the resultant hot gases are directed through nozzles. This drive is usable in any environment, though it is normally reserved for vacuum unless high velocity is needed in a short time. The latter system is similar in principle to a jet engine, sucking air into vents and expelling it through small directional nozzles. This system is usable only in air or water; no combustion is involved.

The maximum acceleration with fluid drive is 5 meters per second per second; that of the reaction drive is 70 m/sec². Xenoborg home-planet gravity ("XG" force) is about 8.23 m/sec² (9 yards/sec²). A Xenoborg can withstand 2-3 XGs indefinitely, but can survive maximum thrust (8.5 XGs) for only a few minutes.

In the first wave of the invasion, most Teleborgs landed only briefly to deploy their troops, then immediately lifted off, thus presenting a fixed target for only a few seconds. Some of the creatures were left



near Earth's surface, but most were withdrawn to a stable orbit about the planet, to minimize both power expenditure and vulnerability. Within a few days, after the invading Xenoborgs completed their first sweep of Earth's conventional forces and achieved a firm hold on the planet, more than 2,500 Teleborgs were brought back to the surface to serve as bases. Upon landing, they settled firmly into their design-

nated locations and hungrily extended their roots into the earth.

The creatures were ravenous. For years they had been forced to feed on the sparse nutrients in the lunar rock, though their diet was minimally augmented by the base's food-culture tanks. During the days of the invasion itself, they survived on what little nourishment they were allowed to carry. After the long-awaited landing,

however, the Teleborgs stuffed themselves on the feast afforded by the terran soil. Consuming all plant and animal life within a range equal to twice its diameter, each creature at least doubled in size within a few weeks. The nearby soil, permeated by the Teleborg's root system, turned bluish-black as it became saturated with excretory ooze. And as it grew in size, each Teleborg grew in intelligence as well. Within a month of the invasion, the Xenoborg bases became large, smart, dangerously festering sores on the face of the Earth.

A scant few of the space-going Teleborgs carry Q-drives as well. For security reasons, any Teleborg equipped with such a device remains a vessel, and is never converted for use as a base. In addition, the Q-drive is equipped with a self-destruct mechanism, and is under the constant personal supervision and control of a Xenoborg officer of at least the rank of Major. No Q-drive is allowed on the Earth for any reason.

Defenses

The chart at left gives the number of tentacles above the surface. That value does not include the creature's root structure, which involves about 10 times as many growths, though these are relatively inflexible ones. Tentacles may be protruding or withdrawn at any time, but if the latter is the case, an exterior dimple remains; this expands into a pore from which the tentacle can again be extruded. The maximum length of a tentacle is equal to half the Teleborg's diameter. A tentacle may be used to strike or grasp, but it is always smooth, never marked by spikes or other protruberances.

Base-Teleborgs have no visible body openings, except for the dimples or pores for tentacles. Visitors must approach the creature and allow a tentacle to touch and examine them. If the Teleborg decides that entry is permitted, it creates a hole in its surface, allowing access to its interior cavity. If a base is staffed, those inside may cause the creature to open itself, either for egress or for fast entry by approaching allies. Base-Teleborgs do not allow entry by any terran life forms, and will automatically and vigorously defend themselves. Any intruder who survives the creature's ranged defenses (see Equipment, left) and tentacle attacks to successfully penetrate the outer surface is subjected to an acidic digestive attack of fixed damage 10 (using d10x to hit vs. SDV) during every combat Phase spent within the body cavity.

As with Xenoborgs, modifications by cell hardness may apply to soft, natural, or firm cells or body parts. The procedure for determining adjustments is identical to

Space- and Base-Teleborgs (by size)

	Small	Medium	Large	Huge
Dimensions				
Diameter	16	32	48	64
Thickness	4	8	12	16
Volume	536	4,290	14,476	34,315
Tentacles				
Maximum length	8	16	24	32
Maximum number	10	20	30	40
Stats				
Mental	8	16	24	32
Neural	24	49	73	97
Physical	1,075	8,500	29,000	68,500
Move rate^a	5	10	20	30
Attacks per Cycle	5	10	15	20
Defense Values (DVs)^b				
Laser	25	30	35	40
Impact	35	40	45	50
Thermal	30	35	40	45
E-M	20	25	30	35
Sonic	15	20	25	30
Integrity Points (IPs)				
basic game	2,150	17,000	58,000	137,000
advanced game				
Total	3,225	25,500	87,000	205,500
Body	2,900	23,460	81,780	197,280
Tentacle (each) ^c	32	102	174	205
Battery Power				
Maximum PU	2,000	4,000	6,000	8,000
Recharge rate	500	750	1,000	1,500
Equipment				
Comm Class	3	4	5	5
Weapons				
Class 1	8	12	16	20
Class 2	4	6	8	10
Supply units	5	20	80	160

a. Movement rate (for land or water) assumes no root anchoring, and the production of short, stiff tentacles to serve as legs. Typical rates using the propulsion devices are 50-80 for fluid propulsion (air or water), and 4,000-5,000 for reaction drive.

b. DVs: assumes combat conditions; note that variations by exterior hardness also apply.

c. Value per tentacle at maximum size; proportionately less for smaller tentacles.

Deduct total tentacle values from overall total to find current body value.

Do-It-Yourself Teleborgs

that for Xenoborgs. The percentages given on the inside cover apply to Teleborgs as well, as do the details for Xenoborg body parts listed and explained on page 37. A Teleborg never has a head or feeler, but all other details may be used.

Equipment

A Teleborg functioning as a base contains all the devices with which it was equipped for the invasion, with additional mechanisms for its new purpose. The former category includes the propulsion systems detailed earlier. The weapons and Comm units vary by the Teleborg's size, as given on the table below; select specific items from the lists given for Xenoborgs (page 37-38). Power for a Base-Teleborg's weaponry comes from chemical batteries, each of which holds a total PU as given on the table below. Power can be regenerated during daylight hours, when specialized cells of the Teleborg's body act as solar collectors, absorbing sunlight and converting it to recharge the batteries.

A Base-Teleborg also serves as a supply depot for Xenoborg troops. The number of Supply units per base is given in the chart on the previous page. The items listed below are included in *each* Supply unit given; multiply by the number on the chart to find the total present. Keep track of the supply status of all Base-Teleborgs that appear in an adventure or campaign with any frequency. Base-Teleborgs for which you do not keep an accounting may be assumed to maintain full stock at all times, unless character actions prevent

the regular resupply vessels from reaching them.

Base-Teleborgs are also used as warehouses for storing terran devices of interest collected by marauding Xenoborgs, and for holding terran captives (human and otherwise) as well. Terran objects and creatures are always kept in body cavities separate from the Xenoborg operations area. Captives are usually fed to the Base-Teleborg after their use is ended, though the Xenoborgs occasionally consume a few themselves. If large numbers of objects and/or creatures are collected, some may be kept in an outside area near the Base-Teleborg (though still under the creature's guard). This situation is rare, however, and is usually alleviated within a few days by the arrival of a vessel to pick up the merchandise and shuttle it elsewhere, usually to a dump near lunar base.

If characters try to reach the Xenoborgs' lunar base by hiding amongst collected objects, they will either be overwhelmed by the hundreds of well-armed

and armored Xenoborg troops therein, or removed via anti-matter bombs. CC Command will absolutely veto any such plan that the characters may suggest, and forbid them to endanger themselves in this way. (Lunar base itself will be detailed in a future accessory.)

Do-It-Yourself Teleborg Bases

Since most game details are directly based on a Teleborg's size, you can apply the formulae given here to find the IPs, number of tentacles, and other details for a creature of any size. Start with either the diameter or radius (1/2 the diameter) of the Teleborg desired. Use a calculator.

Abbreviations used

D	diameter
R	radius
T	thickness
V	volume
•	multiplication
$\sqrt[3]{}$	cube root

Base-Teleborg Supplies (per Supply Unit)

Powers: 5

Comm Units:

- 1 each of types 1 & 2
- 1 backup for each higher type used by Xenoborg staff

Weapons:

- 3 Electromagnets
- 1 Electrostatic Generator
- 12 grenades (2 per type)
- 1 Ignition system
- 1 Laser
- 1 E-M Beamer
- 1 Pulser
- 10 magazines (500 shots) normal pulser ammo
- 2 magazines (100 shots) explosive pulser ammo

Creating Base-Teleborgs

Dimensions

Diameter (D): Select one. Find the radius (R, which is 1/2 the diameter).
Thickness (T) = $R \cdot 0.5$
Volume (V) = $R \cdot R \cdot T \cdot 2.094395$

Tentacles

Maximum length = T
Maximum number = $T \cdot 2.5$

Stats

Mental = $T \cdot 2.5$
Neural = $3 \cdot \sqrt[3]{V}$
Physical = $V \cdot 2$

Move Rate: 5 to 30 or more; extrapolate from the chart

Attacks per Cycle = $T \cdot 1.25$

DVs: Extrapolate from the chart

Integrity Points (IPs)

basic game = Physical score $\cdot 2$
advanced game
Total = Physical score $\cdot 3$
Body = total IPs $\cdot F$, where F ranges from 0.9 (for radius 8) to 0.96 (radius 32) or more, approaching but not reaching 1.0; extrapolate from the chart
Each tentacle = (Total IPs minus Body IPs) $\div$ Maximum number of tentacles

Battery Power

Maximum PU = 2,000 to 8,000 or more (extrapolate from the chart)
Recharge rate = 500 to 1,500 or more (extrapolate from the chart)

Equipment: Extrapolate all from the chart

Q-Space Travel

Xenoborgs are an intelligent, adaptable, technologically advanced race, but they would be no more than a footnote to galactic history were it not for their interstellar propulsion system, the Quantum drive. This device shifts itself and a predictable amount of nearby matter (such as a vessel) into a frame of reference that is not limited to three dimensions. In practical terms, it reduces very long distances to short ones, thereby making all of our galaxy (and others) reachable.

The Empire

The Xenoborgs' realm consists of hundreds of planets, most populated by life forms of lesser orders than themselves. Since no effort was made to conquer by sector, the planets that comprise the Empire are scattered throughout the galaxy in no particular pattern; they are merely those which had the misfortune to be encountered by Xenoborg probes.

These probes are completely mechanical devices, equipped with Q-drives and launched in all directions parallel to the galactic plane. They are often aimed at target stars or groups thereof, though some are also shot off at random.

Many probes are destroyed by a variety of hazards, and some pass beyond practical ranges, eventually reaching far distant galaxies. Most re-enter normal space from fourspace (see below) in the vicinity of solar systems that are unsuitable for Xenoborg colonies, though the planets may be rich enough to warrant a mining operation. Less than one probe in a thousand encounters a planet meeting the aliens' ideal specifications, where carbon-based life forms flourish and the liquid water exists. Such is their home planet, and of course, such is Earth. In the early 13th century (as humans reckon time), a randomly directed Xenoborg probe happened upon the solar system of Man.

A probe always destroys its Q-drive upon re-entering normal space. Though survey reports could be obtained in hours or days if the probes were permitted to return, this option would involve a chance

— miniscule though it might be — of another race capturing one of the devices, and with it, possibly, the secret of the Q-drive. The Xenoborgs have never encountered another race that possesses Q-drive, and they want to keep it that way if at all possible. Therefore, they are content to spend decades, or even centuries, waiting for a probe's signal to return, crawling along at the speed of light.

Upon receipt of the signal from a successful probe, however, the Xenoborgs waste little time. A more sophisticated two-way probe is often sent to get a situation update; this device may even be occupied by a Xenoborg or two. And from the moment the decision is made to use a newly discovered planet or system, that locale is quickly accessible by any of the thousands of Xenoborg vessels equipped with Q-drives that the Emperor and Council may choose to send. Any target within the galaxy is effectively closer, in terms of travel time, than was America to its European colonists of 17th century Earth.

At the time of the game, Q-drive is unknown to Man, despite the fact that its operation can be derived from basic formulae known through much of the 20th century (see Appendix, next page). As noted above, the drive is the most closely guarded secret of the Xenoborg Empire, and it will not be allowed to fall into human hands, though a future CC Force operation may (and should) capture a Q-drive mechanism over the aliens' objections.^a But since the very existence of the drive can be deduced from the Xenoborgs' presence, and since knowing that something is possible often surmounts the biggest hurdle in the path of creativity (scientific or otherwise), Earth may develop its own Q-drive within two years of the invasion. The following details are thus very relevant to either that event or the intensive study that will follow the capture of the drive from an extra-terrestrial source.

Fourspace

Classic theory often depicts the universe as a "rubber sheet" in which the

gravity of a mass, such as a planet or star, produces a dimple, or "gravity well." In Q-drive mechanics, this model is still partially valid, but gravity sources are assumed to produce not wells, but "gravity peaks" of varying steepness and height. (Simply invert the previous model, but remember that such models describe only the physics of a region, not the region itself.) The top of such a peak represents the center of the mass producing it, and the curvature of the peak represents the density of the mass.

But when the universe is pictured in this way, its three dimensions lie within that two-dimensional rubber sheet. The peaks protrude in a new dimension, that of gravity. This picture thus has four dimensions, so it is called fourspace (or space⁴), as opposed to "normal" space (also called threespace, or space³). The basic principle of the Q-drive is this: if force is applied to an object in a direction at right angles to all three of its dimensions, the object can be moved to a point very near to but "above" that inverted-rubber-sheet universe — that is, moved along the fourth dimension of gravity. The mechanical details of such force applications are complex,^b but the amount of energy needed is relatively small.

Q-drive Limits

The energy cost of movement into space⁴ — that is, a Q-shift — varies by the characteristics of space³ in the vicinity of that mass. The inverted rubber-sheet model shows that a Q-shift is easiest (i.e. requires the least energy) where the sheet is flat. The greater the curvature of space (and the taller the gravity peak), the more energy is required.

That same curvature of space³ imposes a limit on Q-shifts. The force of a gravitational field in excess of 11,145 Newtons (a fixed constant) causes the particles entering space⁴ to disintegrate in the process. That force (f) at any given point can be calculated using equation 1 (next page). Express all masses in grams, and all distances in centimeters. The distance limit D_L within which the Q-drive will

a. This adventure is scheduled for release in 1989.

b. Particles released by a controlled laser-generated fusion process are manipulated so that each particle's moments of spin and magnetism are converted to imaginary quantities. This forces the particles into non-existence without destroying them. In experiments performed in microscale, both the particles and a fixed amount of nearby matter simply vanish.

not function properly is thus determined (in centimeters) by equation 2. Multiply the result by 100,000 to find kilometers, or by 62,137.1 to find miles.

1: $f = GMM_B \div D^2$
2: $D_L = \sqrt[3]{(MM_B \div 2.2489 \cdot 10^{12})}$

G = 6.67 • 10⁻⁸ dyne cm² gm⁻² (a universal constant)
M = the small mass of the object being moved
M_B = the large mass of the body exerting the gravitational force
D = the distance between the centers of masses M and M_B
D_L = distance limit from center of mass M within which a Q-shift will not work properly

Movement

Though entry into space⁴ requires a special application of force, the shift mechanism is not needed thereafter. Once it is within space⁴, an object will remain there until it again comes within the gravity field of a large mass (as described above).

Space⁴ is part of the normal universe, though not a part with which most creatures are familiar. Within it, *all physical laws still apply*, including the physics of movement. Einstein established long ago that velocity and acceleration are measurements relative to the surroundings (whether “real” or “Q-type”) of the observer; space⁴ is merely a new frame of reference.

When a real (space³) distance is measured in “Q-units” — each equal to 10¹⁰ atomic diameters, or 1.145 meters (3.75656 feet) — the relationship between distances in space⁴ (D₄) and normal space (D₃) becomes very logical. D₄ equals the cube root of the square of D₃ (equation 3).

3: $D_4 = \sqrt[3]{(D_3)^2}$ or $D_3 = \sqrt{(D_4)^3}$

Space⁴ represents a considerable savings in distance, and therefore in trip times as well. But the effect of that relationship between the spaces is that the further one travels in space⁴, the *greater* the savings. Assume that a vessel accelerates at one Earth-gravity for half of a given trip, then flips over and decelerates at the same rate. A trip of one light-year (9.454 trillion kilometers, or 5.875 trillion miles) would take about 38 hours using Q-drive. But a trip from Earth to the home planet of the Xenoborgs, 700 light-years away, would take only 340 hours. Though the distance is 700 times as far, the trip takes less than 9 times as long.

Table 1 gives a few sample distances, all measured in real (space³) terms. Table

2 gives the shorter space⁴ distances between certain planets and stars. The resulting travel times for different accelerations are given in Table 3.

Travelers in space⁴ see a universe that appears to have been flattened out into a two-dimensional plane, in which their vessel is moving, but “normal” distances appear to pass with much greater speed than they did in space³. Both of these phenomena occur because one of the “normal” three dimensions has been replaced by the previously “imaginary” fourth dimension, making the former irrelevant to (and actually invisible from) the traveler’s perspective.

If the traveler is able to detect gravity effects at long range, either through normal senses or special equipment, the gravity peaks protruding from the space³ masses become visible. The traveler can then deduce information about the masses by examining the heights and slopes of the peaks (as well as their brightness, which indicates heat), and can make a well-informed choice as to the point of reentry into space³. That reentry process is simple; merely entering a gravity peak of sufficient height pulls the traveler and any associated matter (such as a vessel) back into normal space. Speed at re-entry is identical to that immediately prior to it; only the frame of reference

changes. The speed of light is still a fixed limit in both space³ and space⁴.

Tables & Appendix

The following abbreviations are used herein:

- A Andromeda galaxy
- a acceleration
- D₃ real distance (in normal space³)
- D₄ effective distance in space⁴, using Q-drive
- E Earth
- G_E gravity of Earth = 9.8066 m/sec² (32.174 ft/sec²)
- G_X gravity of Xenoborgs’ home planet = 9.06 m/sec² (29.7244 ft/sec²)
- J Jupiter orbit (averaged)
- LY Light Year (distance)
- M Magellanic clouds
- O Our galaxy (the Milky Way)
- P Parsec (distance)
- Q Quantum
- S_E Earth’s Sun
- S_X Xenoborgs’ Sun
- T time
- X Home planet of the Xenoborg Empire

Table 1
Real Distances (D₃)

Range	Light Years	Kilometers	Miles	Q-units
J to S _E	2.132 • 10 ⁴	7.783 • 10 ⁸	1.25255•10 ⁹	6.7974 • 10 ¹¹
1 Light Year	1	9.454 • 10 ¹²	5.875•10 ¹²	8.2568 • 10 ¹⁵
1 Parsec	3.26	3.08 • 10 ¹³	1.91525•10 ¹³	2.69 • 10 ¹⁶
S _E to S _X	700	6.6178 • 10 ¹⁵	4.1125•10 ¹⁵	5.7797 • 10 ¹⁸
cross O	75,000	7.0905 • 10 ¹⁷	4.40625•10 ¹⁷	6.1926 • 10 ²⁰
O to M	800,000	7.5632 • 10 ¹⁸	4.7•10 ¹⁸	6.6054 • 10 ²¹
O to A	1,840,000	1.7395 • 10 ¹⁹	1.081•10 ¹⁹	1.5192 • 10 ²²

Table 2
Space⁴ distances ($D_4 = \sqrt[3]{[D_3]^2}$)

Range	Miles	Kilometers	Q-units
J to S _E	55,002.7	88,518.3	77,308,580
1 Light Year	29,064,532.5	46,774,831	40,851,380,832
1 Parsec	63,873,407.9	102,794,285.7	89,776,668,771
S _E to S _X	2,291,370,772	3,687,603,803	3,220,614,675,000
cross O	51,689,720,591	83,186,541,695	72,652,001,480,665
O to M	250,470,548,598	403,093,274,563	352,046,528,002,633
O to A	436,417,910,610	702,346,545,933	613,403,096,884,329

Table 3: Travel Times in Space⁴

The following presumes constant acceleration for half the trip, followed by flip-turnover and constant (equal) deceleration thereafter. All accelerations/decelerations are in units per second per second. Abbreviations: D, H, M, S = days, hours, minutes, seconds.

- I. Alien Probes (no life forms aboard);
a = 70 meters (229.66 feet)
II. Vessels containing Xenoborgs;
a = G_x = 9.06 meters (29.7244 feet)
III. Hypothetical vessels containing humans; a = G_E = 9.8066 meters (32.174 feet)

Formula:

$$T = 2 \sqrt{(1000 \cdot D \cdot a)} \quad \text{where...}$$

T = total trip time assuming midpoint flip;
D = distance in kilometers; and
a = acceleration, in meters per second²

Range	I. Probe				II. Xenoborgs				III. Humans			
	D	H	M	S	D	H	M	S	D	H	M	S
Jupiter to Earth's Sun			37	29		1	44	11		1	40	09
1 Light Year		14	21	40	1	15	55	05	1	14	22	06
1 Parsec		21	17	22	2	11	10	35	2	08	52	44
Xenoborg home to Earth	5	07	30	43	14	18	26	03	14	04	40	28
Across our galaxy	25	05	37	36	70	03	24	36	67	10	03	28
Milky Way to Magellanic Clouds	55	13	09	25	154	09	39	55	148	09	48	22
Milky Way to Andromeda	73	07	45	47	203	19	28	01	195	21	34	24

Appendix

Formulae relevant to the discovery, description, and use of Quantum Space

Warning: The actual derivations of these formulae are not given here; after all, Man has not yet discovered them. This section does, however, give the tools that will be used in the forthcoming discovery. Feel free to attempt the derivations if you are both mathematically creative and also quite familiar with tensor calculus.

1. The gravity force acting on a mass is obviously determined by the gravitational field in the nearby area. At point P, a distance R from a large mass, this field is of intensity I (equation 1) where F = force on mass M at P.

2. For a spherical body, the gradient

(ϕ) of the gravitational potential of a field is given by equation 2, and the potential energy of M within that field = $V = M\phi$.

3. Consider the effect on the above of Einstein's metric tensor $g_{\mu\nu}$, the generalization of Newton's formula expressing the geometry of space-time (equation 3).

4. The Schwarzschild solution for the metric tensor outside a static spherically symmetrical mass distribution, when properly manipulated by an N-dimensional algebra (using a Hilbert space) so as to examine the curvature inherent in the gravitational field, provides a key perspective that escalates space⁴ from an

abstraction to a phenomenological reality (equation 4a). This refers to the four-index curvature tensor $R^{\mu}_{\nu\sigma\tau}$, of course, and incorporating the principles described by the field equations, summarized symbolically by equation 4a (where $k = G + c^2$ and $T^{\mu\nu}$ is a symmetrical tensor of the broadest possible scope).

5. The Dirac equation that defines the relation of spin and magnetism in an electron also defines the principle of the Q-drive mechanism itself (equation 5), although considerable experimentation is required in the field of artificially maintained fusion reactions before this can be implemented.

Equations

$$1: \quad I = GM \div R^2 \quad \text{and} \quad F = IM$$

$$2: \quad \phi = -GM \div R \quad \text{where} \quad I = -\text{gradient } \phi$$

$$3: \quad ds^2 = \sum_{\mu, \nu=1}^4 g_{\mu\nu} dx^\mu dx^\nu$$

$$4a: \quad ds^2 = (1 - [2km \div r]) dt^2 - (1 - [2km \div r])^{-1} dr^2 - r^2 d\theta^2 - r^2 \sin^2 \theta d\phi^2$$

$$4b: \quad G^{\mu\nu} = 8\pi k T^{\mu\nu}$$

$$5: \quad \iiint [|\Psi_1|^2 + |\Psi_2|^2 + |\Psi_3|^2 + |\Psi_4|^2] dx dy dz = 1$$

Invasion

Having spent decades studying Man-kind and preparing for the invasion of Earth, the Xenoborgs executed a plan of attack that was comprehensive, effective, and successful. Though the details are far too numerous and complex to be given here, a summary will convey the overall result. For clarity, the point of view throughout is the Xenoborgs', at a time just prior to the invasion.

Troop Organization

When the invasion begins, the attack force will consist of two armies, each organized in standard fashion, as shown in the table below. Titles of groups and commanders are translated into the approximate English language equivalents, and may not correspond exactly to any one country's current military organization.

Command

Man has not discovered the existence of Q-space, so the command headquarters (CHQ) for the invasion will be deployed therein, next to the base of Earth's gravity peak. However, it is imperative that Q-space technology be kept secret from humans. Therefore, communications with CHQ will be by standard non-mobile Q-space capsules. The possession of Q-

capsules outside of CHQ is limited to officers of the rank of Colonel and higher.

CHQ personnel will consist of one Marshall, all 10 Generals, and 40 Brigadiers. The remaining Marshall and 10 Brigadiers will occupy moon base HQ, to assume command in the unlikely event that CHQ can no longer function.

Objectives

Our long-range goal is to colonize Earth and make it a useful addition to the Empire. Earth's environment is a desirable one, including its atmosphere, life forms, and material assets. Furthermore, its position in the galaxy makes it suitable as a base from which further exploration can be conducted.

Though Earth's dominant sentient life form is of little use to the Empire, many of Man's creations have value. Cultural products, including music and the graphic arts, may be profitable export items. Cities are rich sources of refined metals and other processed materials. Ideally, the metropolitan areas should be carefully dismantled — "mined" for their physical contents — within a few decades of the invasion.

We thus want Earth intact, and that means minimizing the adverse effects of the invasion with respect to the planetary ecology. The weapons used to wrest the

planet from its current sentient occupants must therefore be carefully selected, and resistance presented by those occupants must somehow be limited to effects that do not seriously upset that ecology.

Military Targets

The military forces of Earth do present a problem. If not removed quickly, they are quite capable of rendering the planet useless for our purposes (and for Man's as well, though this is irrelevant) by using their primitive, "dirty" nuclear weapons. The military forces are also the only humans possessing sufficient lesser armament to present a real threat to our troops. Therefore, a special plan has been designed to handle this threat.

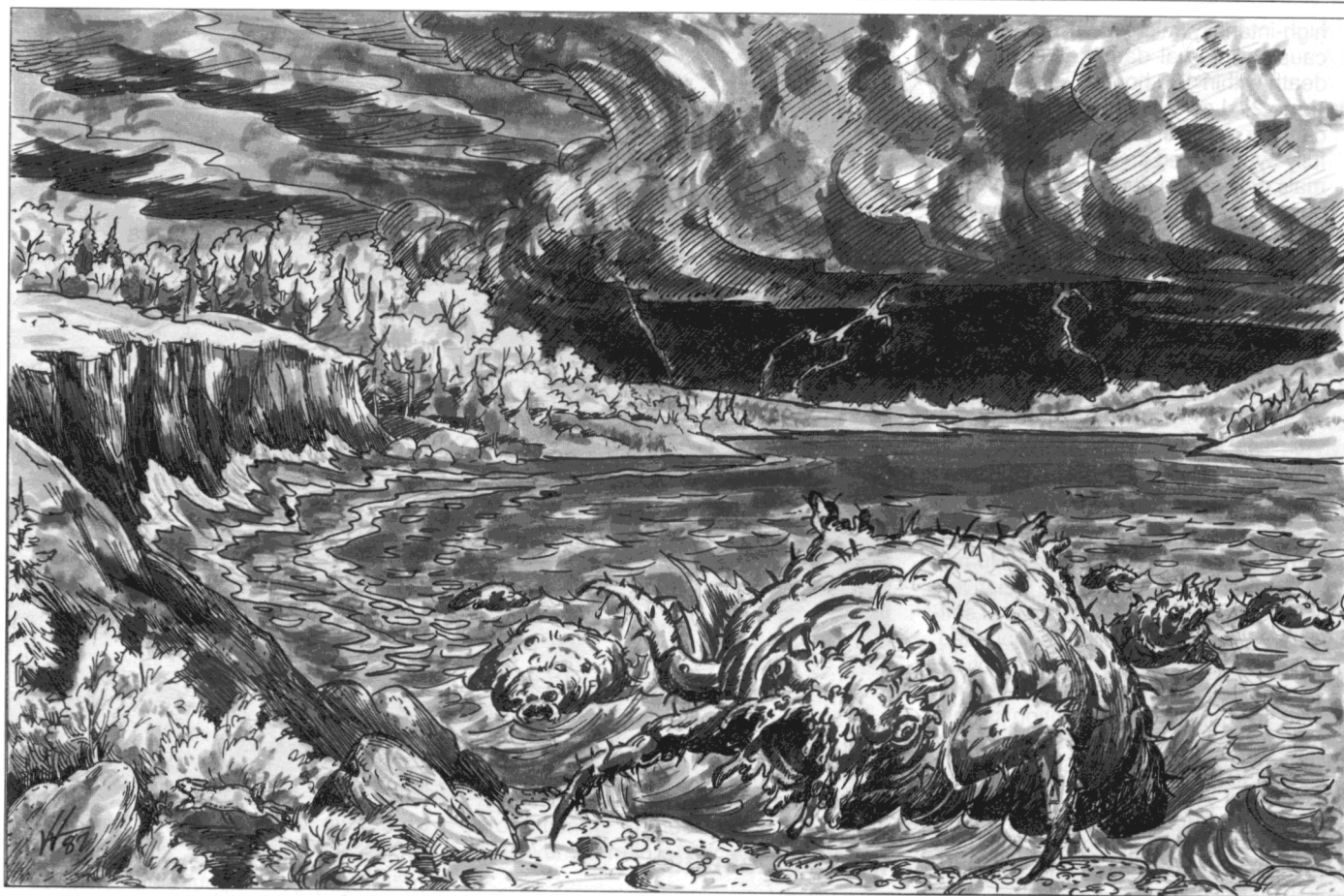
First and foremost, our initial troop deployments will be as widespread as possible. Many troops will be aerially dispersed across large areas. Since humans are not aquatic or amphibious, most such dispersals will be over land targets. Some hyperdehydrated troops will be deployed in fresh water, and should achieve some measure of surprise when they emerge.

When a carrier vessel lands, its troops will immediately spread out in all directions at maximum speed, ignoring or evading local resistance. The vessel itself will depart the instant all troops are out, or upon detecting an incoming nuclear attack, whichever happens first. With maximum troop dispersion, the efficiency of retaliation by nuclear weapons will quickly drop. The humans should realize that and refrain from useless attacks.

As a secondary objective, we shall seize all fissionable material currently used in weapons and power systems, and shall later secure all such reserve and raw material that could possibly be used for those purposes.

Earth's Orbital Station, the most expensive, but most promising, of Man's recent experiments, was begun in 1994 and quickly became an eternal project; it is still in progress. It has a resident staff of 150 humans and about 30 other visitors at any given time. Unmanned orbital devices currently circling the planet include about 700 functional communications, power, research, and military satellites, the last type often containing nuclear weapons. Most of Man's extraterrestrial devices, with the sole exception of the Orbital Sta-

Xenoborg Troop Organization				
Group Rank	Number of Xenoborgs	aka	Leader	Total Groups per Army
Army	410,156	5 corps	Marshall	1
Corps	82,031	5 divisions	General	5
Division	16,406	5 regiments	Brigadier	25
Regiment	3,281	5 battalions	Colonel	125
Battalion	656	5 companies	Major	625
Company	131	5 platoons	Captain	3,125
Platoon	26	5 squads	Lieutenant	15,625
Squad	* 5	4 Privates & 1 Cpl.	Sergeant	78,125
(Individual)	1	1 Private or Cpl.	—	390,625
Total troops: 410,156 per army, or 820,312 total				
Officers only: 3,906 per army, or 7,812 total (just less than 1 %)				
* For initial organization and post-combat stabilization only; after combat attrition and minor field reorganization, a squad may consist of 3-7 Xenoborg troops				



tion, will therefore be destroyed by our approaching vessels, using particle beams, lasers, and antimatter bombs.* The sole exception is the Orbital Station; because of its resources, it is instead scheduled for depopulation.

Our probes have compiled extensive records of the deployment of land-based nuclear missiles worldwide. These weapons will not fire if their containers do not open. In the first minutes of the invasion, therefore, high-intensity lasers will be used to weld every missile silo shut, fusing earth and steel to prevent launches while avoiding detonations. Radiation-absorbing chemicals will be dumped on those areas simultaneously to minimize ecological damage in the event of accidental detonations. Troops will then be sent in force to seize all such missiles that remain for our later use.

Mobile nuclear missiles (such as those housed by submarines) will present a

problem, but will be the subjects of intensive troop deployment — generally, one squad per three missile launchers or submarines. If possible, these carriers will also be welded shut before launching their missiles, like the land-based silos.

All military installations and vessels that contain no nuclear devices will be destroyed by antimatter bombs.* Several hundred thousand of these have been assembled in deep space and are now ready for use. Though it may seem wasteful to vaporize the vast amount of refined material in these military targets, it has been deemed necessary for the security of the operation in both the short and the long term.

Non-Military Targets

Based on careful analysis of Man's position in the planetary ecology, we have

decided that up to half of the population can be removed in the initial stages of the invasion, but no more — at least not until a more thorough analysis can be made of the ecological effects of extensive depopulation. In fact, the immediate removal of about a third of humanity is advisable, as Man's carelessness is significantly endangering other ecological elements.

For all humans other than those in the military, a basic strategy of urban depopulation will thus be implemented. We have many tools for this technique, and have selected the following for this situation. Various combinations will be employed, depending on the characteristics of the targets.

Option 1: Middle-altitude detonations of nuclear bombs with a low half-life designed to spray radiation with maximum effect on life forms but minimum effect on other materials; plus broad

* Translator's Note: An antimatter bomb is mostly normal matter. It holds a very small amount of magnetic antimatter — usually 10 grams or less — suspended by a superconductive electromagnet within a chamber of perfect vacuum.

A typical antimatter bomb is cylindrical, about 2' long and 1' wide, and is not fragile. The detonator is a tiny amount of normal explosive, which destroys a crucial component of the electromagnet. The antimatter then falls to one side, exploding on contact with the normal matter. The reaction is over 99% efficient; each gram of antimatter produces the energy equivalent of almost 10,000 tons of TNT, vaporizing all matter in the blast radius.

These devices can only be assembled in deep space, and the process is quite hazardous; contact with even a few atoms of normal matter could cause an explosion. The antimatter used to construct such bombs is mined by a complex procedure from certain areas at the fringes of and outside of our galaxy.

high-intensity microwave broadcasts, causing internal damage resulting in death within 100 hours.

Option 2: Low-altitude spraying and canister drops of poisonous gas, carefully synthesized so as to affect mammals only and to degrade into an ecologically inert substance within 200 hours. The substance is not lethal to us, but it is unpleasant.

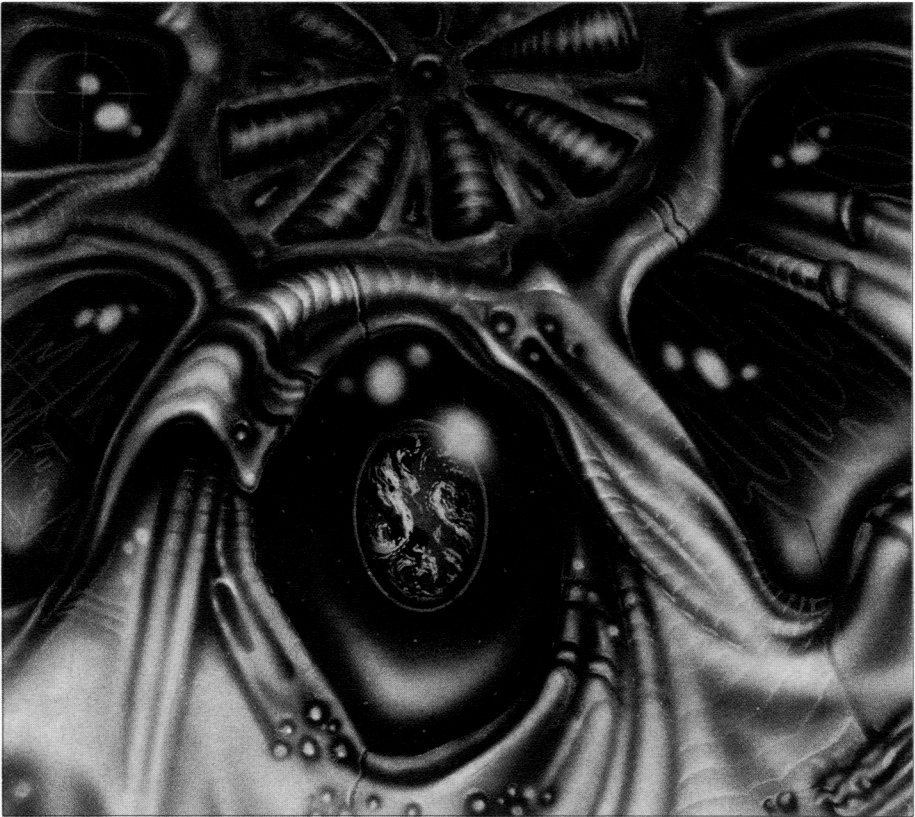
Option 3: Short-range combat methods, including lasers, projectile weapons, microwaves, and specially grown personal weaponry. The last shall include claws and mandibles, plus barbed and spiked appendages of various sorts.

During and after the depopulation of major metropolitan areas, we will cut off supplies of food, water, and power from most of the remaining population. Human attrition therefrom should be relatively light, since the areas least capable of self-sufficiency are those being depopulated. The purpose here is strategic, not tactical. By deactivating mass communications, forcing the individual's attention toward personal survival rather than group activity, and preventing the rebuilding of society as it has been heretofore known, we can quickly reduce Man to small groups of fearful, uninformed individuals, with little or no chance to present an effective post-invasion resistance.

Certain key areas will be left with power deliberately, and if humans reactivate any of the initially targeted power sources, they will not be stopped. Instead, we will take control of communications stations that become operative, and use them exclusively for our own transmissions. Most have been assembled from parts of previous broadcasts; some are computer-generated imitations. Although our programs will seem to be of normal human origin, they have been carefully constructed for precise psychological effects. Those who have the capacity to listen to their radios, or to watch their audio-visual receptors, will find only despair, and apparent international acceptance of our dominance.

When the situation stabilizes after the initial days of combat, squads will be deployed to control all noteworthy population centers in which 5,000 or more humans remain. Our posture will not be utterly hostile (though occasional human casualties will serve to maintain a high degree of fear), but our grip will be strong.

Environmental analysis will commence at once. If we find that humans have no critical place in the planetary ecology, we should be able to find some use for them — perhaps as tools, and certainly as a food source. If no uses present themselves, we shall preserve a few for future reference, and remove the remainder.



Initial Results

The following battle summary was transmitted to CHQ on Day 3 of the invasion.

The First Army (excepting its CHQ personnel) comprised the first wave of attack. This consisted of 410,150 troops conveyed by 3,125 vessels. Losses due to nuclear and other space attacks were 76,945; another 6,184 were lost in deployment, as some vessels crash-landed into the sea or on land. Another 47,426 were lost in ground combat before the situation stabilized, leaving 279,595 survivors. The total xenoborg losses were thus 31.83%, slightly more than the 30% anticipated, but quite satisfactory overall, since the conventional forces of Man were virtually destroyed in the process. Only 613 vessels were lost, mostly to nuclear attack.

The Second Army was deployed by divisions to augment our forces in those areas suffering the greatest losses, and to stabilize the situation further. The 689,695 total troops active on Earth's surface are quite sufficient to maintain control of the planet, even though there is only one soldier for each 11,600 humans (averaged; in practice, of course, different areas have different concentrations, the human number in that ratio varying from 1,000 to 50,000).

Some interesting resistance was provided by human troops located in the area

known as the "middle east." The only noteworthy detail about that resistance is the presence of two leaders who were apparently humanoid machines. Reports of other such machines have come in from other parts of the world, and we presume that these are the "cyborg commandos" touted by Earth's media in the last decade. Despite the human propaganda, these devices have presented no real threat as yet. There seem to be very few in any event — perhaps a dozen at most. We expect to capture several for examination in the near future, though their locations are not yet known.

Xenoborg Losses		
Rank	Losses	Survivors
Privates & Cpls	108,421	516,579
Sergeants	19,144	137,106
Lieutenants	2,453	28,797
Captains	441	5,809
Majors	77	1,173
Colonels	14	236
Brigadiers	5	45
Totals		
Officers	22,134	173,178
Others	108,421	516,579
All Ranks	130,555	689,797

Cities and the Invasion

Urban Targets

As a general rule, every metropolitan area on Earth with a population over 4.5 million was selected as a primary target for depopulation during the invasion. The largest cities were the last to go; they were not hit until about 24 hours after the invasion began. These areas were left undisturbed until then for one purpose — communications. The Xenoborgs wanted news of Earth's terrible losses to be transmitted as widely as possible, and that is exactly what occurred. Naturally, all the survivors were sure of Man's eventual victory. Then, as they eagerly awaited word of the unnamed rescuers, that last-minute miracle inherent in every aspect of human culture — everything stopped. The voices of these last great concentrations of human culture were all suddenly silenced. Survivors the world over were startled at first, as if they had seen a famous actor forget his lines . . . and then, with the realization of defeat, came fear.

Depopulation was not total, of course; some people will survive almost anything. To find out how many were left alive in a given city, first divide the population for Jan. 1, 2035, given on the chart (next page), by ten; this gives the maximum possible number of survivors. Then roll d10x. Multiply the two numbers and divide by 100 to get the actual number of persons present on Feb. 1, 2035.

These unfortunates must cope with winter, lack of supplies, pestilence, disease, and radiation sickness — but at least they're alive. Depending on those and other factors, however, only 10-80 percent (GM's judgment) of them will survive more than 4 weeks longer.

Example: The population given for Houston, Texas, is 6,041,203, so the maximum possible survivor total is 604,120. The result of a d10x roll is 18, so 108,742 of the residents survive the depopulation. But due to the lack of natural water in that area, the GM decides that only 30% of them (32,623) are still alive a month later.

These are not the only human casualties, of course, though they are certainly the majority. All military installations are vaporized by anti-matter bombs, and marauding Xenoborg troops have no qualms about removing any stragglers they encounter.

In the following listing, an asterisk (*)

indicates that a CC base of some kind was present in the metro area. Refer to the Base Listing (page 7) for detailed results.

Occupied Areas

Though in a general sense the victorious Xenoborgs occupied the entire Earth, some areas were patrolled more heavily than others after the invasion. The heaviest concentrations of occupying troops were in the cities that were not initially depopulated. The people in those areas were in chaos, lacking proper supplies of food, water, and power; but they were still the largest gatherings of humanity left on Earth, and thereby posed a possible threat.

Base-Teleborgs were placed near all of the following areas, usually in a force proportionate to the number of humans. The average ratio is typically one base per

500,000 — 1,000,000 people, but this can vary widely, especially if some comparatively small city is offering large resistance.

As with the depopulation list, an asterisk (*) indicates the presence of a CC base of some type; unlike those in the previous list, however, these bases still survive, wholly or partially intact, but with increased security and camouflage. Due to the danger that some civilian might reveal the location, almost every base has moved from its pre-invasion location to some other site within the metro area.

This is only a partial list, incorporating metro areas with populations greater than 2 million, but it outlines the densest concentrations of Xenoborgs. One or more Xenoborg squads has been permanently assigned to every area with a population greater than 1 million. Civilian casualties from such squads during the first ten weeks after the invasion range from 5% to 30% of the total population figures given.



Depopulation Table

Nation	Depopulated Metro Area	Population	Nation	Depopulated Metro Area	Population
European Commonwealth					
North					
United Kingdom	* London, England	15,352,100	U.S.A.	Washington, D.C.	9,050,490
Central			U.S.A.	* Boston, MA	7,502,220
B.R.D.	Essen (West Germany)	6,730,430	U.S.A.	Dallas-Fort Worth, TX	7,197,690
France	* Paris	13,129,170	U.S.A.	* Chicago, IL	6,777,050
D.D.R.	Berlin (East Germany)	4,919,285	U.S.A.	* Houston, TX	6,041,200
Magyarország	Budapest	5,890,585	U.S.A.	Baltimore, MD	5,856,430
South			U.S.A.	Cleveland, OH	5,543,090
Italia	* Roma	4,838,900	U.S.A.	Minneapolis/St. Paul, MN	5,557,570
España	* Madrid	7,016,890	U.S.A.	* St Louis, MO	5,325,490
España	* Barcelona	5,522,500	U.S.A.	Pittsburgh, PA	5,221,120
Türkiye	* Istanbul	9,002,600	U.S.A.	* San Francisco CA	4,932,910
Pan-Asian Union			Central		
North			Cuba	Havana	5,194,725
Japan	* Tökyö	30,647,700	México	Mexico City	37,289,610
Japan	* Ösaka	18,056,000	México	* Monterrey	5,885,700
Japan	Yokohama	5,155,090	México	Guadalajara	5,222,590
SSSR	* Moskva	28,390,300	South		
SSSR	* Leningrad	12,734,200	Argentine Rep.	* Buenos Aires	39,757,500
SSSR	Kiev	5,052,995	Argentine Rep.	* Santiago, Chile	11,290,500
Taehan Min'guk	* Söul	25,599,280	Brasil	* São Paulo	38,214,000
Taehan Min'guk	* Pusan	6,841,300	Brasil	Rio de Janeiro	24,656,940
Southwest			Brasil	Belo Horizonte	7,073,855
Irän	Teheran	8,841,380	Brasil	Montivideo, Uru	6,651,370
Päkistän	Karachi	10,273,125	Brasil	Recife	6,190,765
Päkistän	Lahore	5,927,495	Brasil	Salvador	5,742,180
Southeast			Brasil	Porto Alegre	5,081,795
Bhārat	Calcutta	20,908,475	Colombia	Bogota	15,226,720
Bhārat	* Bombay	16,036,600	Colombia	Lima, Peru	13,819,880
Bhārat	Delhi	10,833,770	Colombia	Cali	5,981,925
Bhārat	Madras	7,372,920	Colombia	Medellin	5,263,145
Bhārat	Hyderabad	5,369,095	Venezuela	* Caracas	9,553,500
Lao	* Krung Thep, Prathet Thai	8,022,860	United Afrika		
Lao	Saigon, Viet-nam	5,106,345	West		
Myanma	* Rangoon	7,127,400	Algérie	Algiers	5,090,202
Zhongguo	Shanghai	40,325,660	Al-Magreb	* Dar-el-Beida	6,134,900
Zhongguo	* Beijing	28,213,050	Nigeria	Lagos	5,075,775
Zhongguo	* Tianjin	16,640,000	Northeast		
Zhongguo	* Victoria, Hong Kong	15,384,125	Misr	Cairo	27,948,700
Zhongguo	* T'aipei, Taiwan	9,087,400	Misr	* Al-Iskandariyah	11,101,320
Zhongguo	Shenyang (Mukden)	9,030,415	Central		
Zhongguo	Wuhan	8,296,205	Zaire	Kinshasa	7,256,870
Zhongguo	* Chongqing	6,893,715	South		
Zhongguo	* Guangzhou	5,942,860	Suid-Afrika	Johannesburg	8,071,055
Zhongguo	Harbin	5,784,235	Suid-Afrika	* Kaapstad	6,177,880
Zhongguo	Port Arthur, Darien	5,620,250	United Nations of Oceania		
Zhongguo	Nanking	5,228,550	West		
Trans-American Union			Indonesia	* Djakarta	20,445,425
North			Indonesia	* Surabaya	9,212,900
Canada	Montreal, Quebec	7,635,435	Indonesia	* Bandung	7,114,140
Canada	Toronto, Ontario	7,314,895	Pilipinas	* Manila	17,299,975
U.S.A.	New York, NY	45,837,465	Singapore	Singapore	12,608,985
U.S.A.	Los Angeles, CA	23,619,710	South		
U.S.A.	Philadelphia, PA	11,372,695	Australia	* Sydney	19,624,270
U.S.A.	Detroit, MI	11,229,920	Australia	* Melbourne	16,836,690
			Australia	Adelaide	9,262,830
			Australia	* Brisbane	6,235,790
			Australia	* Perth	5,430,120

Occupation Table

Nation	Occupied Metro Area	Population	Nation	Occupied Metro Area	Population
European Commonwealth					
North					
U.K.	Manchester, England	3,648,575	U.S.A.	San Diego, CA	4,221,490
U.K.	* Birmingham, England	3,695,615	U.S.A.	Milwaukee, WI	4,010,500
U.K.	Leeds, England	2,638,625	U.S.A.	Seattle, WA	4,021,440
U.K.	Glasgow, Scotland	2,659,335	U.S.A.	Cincinnati, OH	3,867,970
Central			U.S.A.	Kansas City, MO	3,744,075
B.R.D.	Hamburg (West Germany)	2,873,750	U.S.A.	St Petersburg, FL	3,732,370
B.R.D.	Münich (West Germany)	2,095,815	U.S.A.	Miami, FL	3,585,670
Nederland	* Amsterdam	2,514,700	U.S.A.	Denver, CO	3,475,390
Österreich	Vienna	2,841,330	U.S.A.	San Bernadino, CA	3,233,135
South			U.S.A.	Phoenix, AZ	3,159,755
Hellenic Rep.	* Athinai	3,528,900	U.S.A.	San Jose, CA	3,288,725
Italia	* Napoli	3,806,700	U.S.A.	Indianapolis, IN	3,142,705
Italia	Milan	2,627,680	U.S.A.	Portland, OR	3,009,290
Türkiye	* Ankara	3,181,565	U.S.A.	* New Orleans, LA	2,925,335
			U.S.A.	Columbus, OH	2,878,755
Pan Asian Union			Central		
North			Guatemala	Guatemala City	3,191,445
Japan	Nagoya	4,689,920	Hispaniola	* San Juan, Puerto Rico	4,293,260
Japan	Kyoto	3,268,955	Hispaniola	Santo Domingo, Rep. Dom.	2,227,595
Japan	Kobe	2,968,985	México	Puebla	2,278,505
Japan	Kitakyushu	2,400,920	South		
Japan	Sapporo	2,326,525	Argentine Rep.	Rosario	4,652,980
SSSR	Bucharest, România	4,402,490	Argentine Rep.	Cordoba	4,583,100
SSSR	Tashkent	4,250,125	Argentine Rep.	La Plata	2,905,310
SSSR	Warsaw, Polsk	3,904,240	Bolivia	* La Paz	4,016,930
SSSR	Kharkov	3,724,830	Brasil	* Fortaleza	4,435,500
SSSR	Gorky	3,548,735	Brasil	* Belém	3,687,045
SSSR	Novosibirsk	3,521,875	Brasil	Curitiba	3,461,600
SSSR	Kuibyshev	3,190,580	Brasil	Brasilia	3,126,670
SSSR	Sverdlovsk	3,127,900	Colombia	Barranquilla	4,441,340
SSSR	* Minsk	3,159,760	Colombia	* Guayaquil, Ecuador	4,319,495
SSSR	* Odessa	2,660,900	Colombia	Quito, Ecuador	2,871,870
SSSR	* Kazan	2,494,545	Venezuela	Maracaibo	3,961,840
Taehan Min'guk	Taegu	3,287,305	United Afrika		
Southwest			West		
Al-Iraq	Baghdad	4,526,050	Al-Magreb	Rabat-Sale	2,987,915
U.A.S.	Beirut, Al-Lubnän	2,125,250	Ghana	Accra	3,469,220
U.A.S.	Damascus, As-Süriyah	2,538,700	Nigeria	Ibadan	4,272,200
Yisra'el	* Tel Aviv-Yafo	3,207,400	Rep. of Sénégal	* Dakar	3,111,500
Southeast			Northeast		
Bhārat	Ahmedabad	4,740,735	Misr	Giza	4,010,620
Bhārat	* Kānpur	3,136,125	Yaitopya	Addis Ababa	3,850,790
Bhārat	Bangalore	3,109,695	Central		
Sri Lanka	* Colombc	3,660,800	Kenya	Nairobi	3,015,145
Zhongguo	Sian	4,882,310	Tanzania	* Dar Es Salaam	3,388,825
Zhongguo	Tsingtao	4,177,915	South		
Zhongguo	Chengtu	4,125,740	Suid-Afrika	Durban	4,751,035
Zhongguo	T'ai-yuan	3,801,495	Suid-Afrika	Pretoria	3,064,440
Trans-American Union			United Nations of Oceania		
North			South		
Canada	Vancouver, B.C.	3,140,600	Australia	Newcastle	2,747,565
U.S.A.	Atlanta, GA	4,810,620	Australia	Canberra	1,558,600
			New Zealand	* Auckland	3,212,725

1. Standard Time Units

1 Phase of combat	=	0.86 seconds			
1 Combat turn (CT)	=	8.6 seconds	=	10 Phases of combat	
1 Active turn (AT)	=	almost 1 1/2 minutes	=	10 Battle turns (CT)	
1 Standard turn (ST)	=	almost 15 minutes	=	10 Active turns (AT)	
1 Travel turn (TT)	=	144 minutes	=	10 Standard turns (ST)	
1 Day	=	1440 minutes	=	10 Travel turns (TT)	

2. Standard Distance Units

Before you start your game, decide which of the two available units of measurement you wish to use — Metric (recommended) or English. Various units of distance throughout the game are given merely in numbers alone, without units. If you decide to use the Metric system, these are numbers of meters; if the English system, these are numbers of yards. (A meter is 3 feet 3.37 inches, so if you use the Metric system, you get a bonus of almost 10% throughout the game. This will not

actually affect play, as long as you use one system exclusively.)

The number in the center column (below) is used in referring to either individual hexes or general scales. For example, a "number-one hex" appears on a "Scale one map" (i.e. a map overlaid by hexes which are each 10 meters or yards across). Check the scale of your map and reference the appropriate row.

Remember: Use *either* Metric (2a) or English (2b) — *not both!*

2A: Metric System

2B: English System

Distance in meters	Distance in other units	Scale Number	Distance in yards	Distance in miles
1	100 centimeters	0	1	
10	1 dekameter*	1	10	
100	1 hectometer*	2	100	0.0568
1,000	1 kilometer	3	1,000	0.568
10,000	10 km	4	10,000	5.68
100,000	100 km	5	100,000	56.8
1 million	1 megameter	6	1 million	568.2
10 million	10 meg	7	10 million	5,681.8
100 million	100 meg	8	100 million	56,818.1
1 billion	1 gigameter	9	1 billion	568,181.8
10 billion	10 gig	10	10 billion	5.68 million
100 billion	100 gig	11	100 billion	56.8 million
1 trillion	** 1 terameter	12	1 trillion	** 568.2 million
10 trillion	10 terameters	13	10 trillion	5.68 billion

...and so forth, to whatever extent you like.

* Not in common usage; the actual number of meters is normally given.

** Or 6.685 AU (Astronomical Units); 1 AU = the mean distance from Earth to the sun. The solar system is about 8 hexes across at Scale 13 (79 AU).

3. Converting within a system

Metric

Standardized prefixes are used; see Table 5 for most units.

- 1 are = a square 10 meters on a side (pronounced "air")
- 1 hectare = 100 ares
- 1 cubic meter = 1,000 liters = 1,000,000 cubic centimeters (cc)
- 1 liter (l) = 1,000 cubic centimeters

English

- 1 foot (f) = 12 inches (i)
- 1 yard (y) = 3 feet = 36 inches
- 1 mile (mi) = 5,280 feet = 1,760 yards
- 1 acre (ac) = 4,840 square yards = 43,560 square feet
- 1 square mile = 640 acres
- 1 gallon (gal) = 4 quarts = 8 pints = 231 cubic inches

4. Other Units

The following section is provided for your convenience. Man has invented many odd ways of measuring things, and though this game will always use convenient standards, most references will not.

4A: General Information

Temperature

Centigrade:	C° = (F° - 32) x 5/9
Fahrenheit:	F° = (C° x 9/5) + 32
Kelvin:	K° = C° + 273.15

Weight / Mass

Metric

- 1 slug = 14.5959 kg
- 1 tonne = 1,000 kg (also called a metric ton)

English

- 1 slug = 32.1785 pounds
- 1 short ton = 2,000 pounds (assumed unless "long ton" is specified)
- 1 long ton = 2,240 pounds

Special Notes: Avoirdupois and Troy

Avoirdupois system: The standard system, this is used for all substances except those noted below (Troy). Avoirdupois is assumed if no prefix or note is given in the unit of weight. (From a corruption of the French *avois-de-pois*, or *property-of-weight*.)

- 1 pound = 16 ounces = 7,000 grains
- 1 ounce = 437.5 grains

Troy system: This is used for small weights of valuable substances, specifically precious stones, precious metals, and apothecary weights (chemicals & drugs). The units are indicated explicitly by name or by T prefix, except for the carat (used in gemstone weights only), which is always Troy. (Named for an annual 16th-century fair in the French city of *Troyes*.)

- 1 carat = 3.2 T-grains (originally 3 1/3)
- 1 T-ounce = 480 T-grains
- 1 T-pound = 12 T-oz = 5760 T-grains

Distance

1 Angstrom (Å): .000 000 000 1 (10^{-10}) meter
 1 mil = 1/1000 (.001) inch
 1 nautical mile (nmi) = 1.1516 statute miles = 6,080.27 feet = 1.853 km

4B: Converting Units

Use the following chart when, using an information source other than this game, you need to convert measurements given therein to the system you are using (either Metric or English). Find the unit of measurement you want to convert in column 1 or 3, and (reading left to right) multiply by

the factor on the chart. The units of the result are in the following column.

Note: the "English" system used here follows the world standard of common usage, ignoring the variants used by the nation of Britain (United Kingdom).

Velocity (distance per time)

1 knot (kn) = 1 nautical mile per hour = 6,080.2 feet per hour (1.151553 mph)

English Units	Multiply by...	Metric Units	Multiply by...	English Units
inches	2.54	centimeters	0.393701	inches
feet	0.3048	meters	3.28084	feet
yards	0.9144	meters	1.09361	yards
miles*	1.609344	kilometers	0.621371	miles*
square inches	6.4516	square centimeters	0.155	square inches
square feet	0.092903	square meters	10.76391	square feet
square yards	0.836127	square meters	1.19599	square yards
acres	0.404686	hectares	2.471052	acres
cubic inches	16.38708	cubic centimeters	0.0610237	cubic inches
cubic feet	0.0283168	cubic meters	35.31473	cubic feet
cubic yards	0.764555	cubic meters	1.30795	cubic yards
quarts	0.946353	liters	1.056688	quarts
ounces	28.34949	grams	.035274	ounces
pounds	0.453592	kilograms	2.204624	pounds

* statute (land) miles, as opposed to nautical

Force

Dyne (dy): the force needed to give an acceleration of 1 centimeter per second² to 1 gram

Newton (N): the force needed to impart an acceleration of 1 meter per second² to 1 kilogram (1 N = 10,000 dy)

Energy

(units of Force per distance)

Erg: the work done when a force of 1 dyne is applied through 1 centimeter of distance

1 Joule (J) = 10,000,000 ergs = the work done when a force of 1 newton is applied through 1 meter of distance

1 Foot-pound (fp): 13,560,000 ergs

Power

(units of Energy per time)

1 watt (W) = 1 joule per second = 44.27 foot-pounds per minute = 0.73783 foot-pounds per second

5. Standard Metric prefixes

Prefix	Meaning	NOTATIONS	
		Decimal	Exponential
tera	trillion	1,000,000,000,000	10^{12}
giga	billion	1,000,000,000	10^9
mega	million	1,000,000	10^6
kilo	thousand	1,000	10^3
hecto	hundred	100	10^2
deka	ten	10	10^1
-	one	1	10^0
deci	tenth	0.1	10^{-1}
centi	hundredth	0.01	10^{-2}
milli	thousandth	0.001	10^{-3}
micro	millionth	0.000 001	10^{-6}
nano	billionth	0.000 000 001	10^{-9}
pico	trillionth	0.000 000 000 001	10^{-12}
femto	quadrillionth	0.000 000 000 000 001	10^{-15}
atto	quintillionth	0.000 000 000 000 000 001	10^{-18}

Tips For Games

Space does not permit the inclusion here of a step-by-step guide to running a CYBORG COMMANDO™ game. Such a guide would doubtless be a great convenience, and perhaps even a necessity to the novice Game Master; but this game is not designed for that individual. This is rather a new type of role-playing game, one that presents an above-average challenge to players and game masters alike.

The following offers a few guidelines for play. Mundane details such as record keeping are not addressed herein; it is assumed that you know how to organize your own games. Suffice to say that any game can get bogged down in paperwork. It can be hard to keep track of the myriad details of a single combat, let alone an entire campaign. So the mechanics of this game system have been designed with you, the Game Master, in mind. For example, the decimal time-distance system, for example, should make it easy to keep track of those details; you should find it easy to know exactly where the characters are, what time it is (game time), etc.

After becoming familiar with this set, you will probably have questions — about Xenoborgs, Earth, and other topics. Please be patient, and remember that many more adventures, settings, and accessories will see publication in the near future; the answers to all your questions may be contained therein. But if you have questions about specific rules given in this set, or comments about the game as a whole, please write to us. We'd really like to hear from you, and we promise to respond if you send a neatly printed or typed letter, along with a self-addressed, stamped envelope, to:

CYBORG COMMANDO HQ
c/o New Infinities Productions, Inc.
Post Office Box 127
Lake Geneva, WI 53147

Adventure Ideas

The mood of the post-invasion world can be depressing; the aliens have done a thorough job. Man faces his greatest challenge, and has already lost the first round of the fight.

But the mood of the survivors is not despair, but rage. The danger is immediate, and the solution is obvious: destroy the invaders. There is no problem with apathy here, only one of resources; Man's

only effective weapon is the CYBORG COMMANDO™ Force.

The Xenoborgs are prepared to deal with a few heroic types. They know that an Underground will form, and that humans will try to wage a guerilla war. But they know little of the CC characters, and they underestimate us as a race.

This war won't be won in major battles. It will be won by the indomitable spirit of men who refuse to accept defeat.

When you carefully consider the game setting with this perspective — not in the darkness of gloom, but in the light of hope — many scenarios suggest themselves.

At first, the world is in chaos. People are trying to survive in the days and weeks immediately after the invasion. As humanity gathers its collective wits and finds that it still exists (though barely, and at the sufferage of the invaders), life goes on.

While the Xenoborgs are stabilizing their occupation of Earth, people are finding new ways to survive until the water and electricity come back on. And of course, somebody's got to *turn* them back on — either courageous normal humans, or CCs. Survivors will often need assistance, and additional disasters may need handling. Fire is now a great danger, as even a small outbreak could become widespread, racing through the remaining cities and croplands.

The CCF itself has suffered major losses. Some Primaries have been relocated, but most await more staff before that can be completed; though the official transfer of title may be completed in minutes, the relocation of material (if available) takes time. Secondary bases must acquire more supplies before they can become fully functional.

The absence of ordinary commerce and transportation, media through which the vital materials and tools required to support CCs once came, is a great loss. Now those materials must be gathered — and there's another series of adventures. For example, certain ores that contain rare earths are needed to create more Mad-Macs and superconductor components. The principal ores needed are bastnazite and monazite, in which crucial elements such as lanthanum, cerium, and others are found. The largest known sources of these are in Mountain Pass, California, and in the vicinity of Elliott Lake, Ontario. Other major sources are in Australia, India, Brazil, Malaysia, Norway, and South Africa.

Game Elements

You can maximize the fun and excitement by emphasizing the strongest elements of the game. First and perhaps foremost, role-playing as a game form always offers plenty of entertainment. The interchange between interesting personalities is the heart of the matter, of course. Whatever else goes on in the game, this element should always be encouraged. You can help by inserting realistic normals (non-CC humans), such as CCF support staff, townsfolk, and the like. If you are experienced with other role-playing games, you can probably recall several memorable personalities. They can easily be transplanted into a CC game campaign, just by changing a few details.

The CC game is full of exciting, fast-moving combats; the d10x system keeps the action going at high speed. A Xenoborg can usually be slain quickly in a simple "slugfest," but remember that they're smart opponents, and won't just stand there when they're being shot at. Strategy and tactics should be a major factor in any complex battle, challenging even the best of players. The battle in the larger sense is also challenging; the characters must wage a guerilla war, even though the aliens are expecting it.

The scope of the game is the world itself; don't let your game get bogged down in a small, local setting with which you happen to be familiar. Do a little research into foreign countries so you can offer intriguing, exotic locations for adventures worldwide. The major cities of the world are listed in the Depopulation and Occupation charts (pages 59-61), and specific details are readily available from travel guides, specialty magazines, and other standard references.

Let the game's emphasis on hard science and realism carry over into the style of your games and your campaign. Frankly, this style is harder to maintain than one full of sheer fantasy, and it definitely limits the things that the GM and players can do. But it also offers much that no other style can; you'll get the feeling that all this is real — that you could actually build the mechanical parts of a CYBORG COMMANDO character, or that you could pick up a book on Xenobiology at the library. And there's nothing like realism to keep up the interest and excitement in your game.

Welcome to the CC game world. Enjoy.

Xenoborg Chart

	Captain	Major	Colonel	Brigadier	General
Stats					
Mental	40	45	50	60	70
Neural	60	65	65	70	75
Physical	150	200	300	400	500
Move rate	20	25	30	35	40
Attacks per Cycle^a	5	7	8	10	12
Comm Equipment	3	4	5	5	5
Armament					
Class 1	5	6	7	8	9
Class 2	2	2	3	3	4
Defenses (DV's)^b					
Laser	35	40	50	60	70
Impact	45	50	60	70	80
Thermal	45	50	60	70	80
E-M	30	35	40	50	75
Sonic	15	20	25	30	60
Integrity Points (IP's)					
basic game	300	400	600	800	1000
advanced game					
Body	315	420	630	840	1050
Other ^c	45	60	90	120	150

- a. Add +1 attack if the Xenoborg is controlled by a master (either inhabited or via computer).
b. Assumes hard state; see DVs by Hardness (right) for variations.
c. Each of three other parts, such as tail, tentacle, head (including mandibles), legs (the points divided equally among them), etc.

DVs by Hardness^a

Private and Corporal:	Soft	Natural	Firm	Hard
Laser	20	15	20	25
Impact	5	10	20	30
Thermal	15	20	25	35
E-M	10	15	15	20
Sonic	25	20	15	10
Sergeant: As above, except for Impact.				
Impact	5	15	25	35
Lieutenant:				
Laser	25	20	25	30
Impact	5	15	30	40
Thermal	15	20	30	40
E-M	10	15	20	25
Sonic	25	20	15	10
DVs for Captains & higher ranks^b:				
Soft	Natural	Firm	Hard	
Laser	80	60	80	#
Impact	20	40	75	#
Thermal	50	60	70	#
E-M	50	75	75	#
Sonic	250	200	150	#

- a. Add +5 to all DVs of a Xenoborg who is controlled by a Master.
b. Numbers given are percentages; find the DV given on the Xenoborg Chart (represented by # above) and multiply by the percentage given. The SDV increases; others decrease.

Xenoborg Chart

Armament

All ranges are in either meters or yards, whichever you are using in your game.

Private & Corporal Sergeant Lieutenant

Stats

Mental	20	25	30
Neural	50	55	60
Physical	80	100	125

Move rate	10	10	15
-----------	----	----	----

Attacks per Cycle ^a	3	4	5
--------------------------------	---	---	---

Comm Equipment	1 *	1	2
----------------	-----	---	---

Armament			
----------	--	--	--

Class 1	3	3	4
Class 2	-	1	1

Defenses (DVs)^b

Laser	25	25	30
Impact	30	35	40
Thermal	35	35	40
E-M	20	20	25
Sonic	10	10	10

Integrity Points (IPs)

basic game	160	200	250
advanced game			
Body	168	210	264
Other ^c	24	30	37

a Add +1 attack if the Xenoborg is controlled by a master (either inhabited or via computer).

b Assumes hard state.

c Each of three other parts, such as tail, tentacle, head (including mandibles), legs (the points divided equally among them), etc.

* Corporal only.

Class 1

Electromagnet

Power cost: 10 PU per CT
Range: 5
Damage: none

Grenade

Power cost: none
Range without launcher: 50
Range with launcher: 500
Damage (by type):
Explosive fragmentation: normal
d10x (impact)
Gas, paralytic: stat check (neural)
or paralysis 1-10 AT
Gas, poison: stat check (physical)
or death
Smoke: none (obscures vision only)
Sonic: 10 fixed damage (sonic) and
stat check (neural) or
paralysis 1 CT
White phosphorus: normal d10x
(thermal) and 10 fixed
damage (impact)

Ignition system

Power cost: min. (1 PU / 10 ignitions)
Normal jet:
Range: 10
Damage: standard (d10x)
Intense jet:
Range: 2
Damage: d10x +10 bonus

Laser

Power cost: 5 PU per shot
Damage: standard d10x
Range: 1,000 (line of sight only)

Class 2

Electrostatic Generator

Power cost: 10 PU per charge
Range: 10 (to closest ground)
Damage: none (special)

E-M Beamer

Power cost: 5 PU per shot
Range: 30
Damage: standard d10x (E-M)

Missile

Power cost: none
Range (minimum): 30
Range (maximum): 5,000
Damages (2):
Impact: d10x +20 bonus
Thermal: d10x + 50 bonus

Pulser

Power cost: 5 PU per burst
Range: 300
Damage (per burst, by ammo):
Normal: fixed 25
Explosive: standard d10x

Comm Equipment

1. Basic Comm Unit

Power Cost: min. (1 PU/10 signals)

2. A-V Comm Unit

Power Cost: min. (1 PU/5 signals)

3. Sensor

Power Cost: min. (1 PU per AT)

4. Laser Comm Unit (LasCom)

Power Cost: 1 PU per signal sent

5. ComPak

Power Cost: 10 PU per CT of signal

CYBORG COMMANDO™

SCIENCE FICTION ROLE-PLAYING GAME

Players' Adventure Notes



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by Gary Gygax,
Frank Mentzer,
& Kim Mohan

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The Five Alliances

Your first CYBORG COMMANDO™ games will probably take place in the same country, and in fact the same state, where you now live. But this is only a starting point; the campaign takes a much more cosmopolitan view. Your characters will soon be traveling to far-off lands, working and fighting in deserts, jungles, and many other exotic places.

The world of 2035 is of course a bit different than the current one, not merely because of the remarkable technological advances of the near future, but also reshaped by the forces that produced them. The political geography of the world is quite as important as the physical in shaping the history of Man. The boundaries and governments of the Earth are thus major factors in the campaign game, and must be dealt with in due course — perhaps not in your early games, but certainly in the long run.

Although most of the countries we know today (late 1980s) are still present in the setting of this game, many changes

have also occurred. The most extensive changes came with the South American Territorial Wars (2005-2009). Still more occurred when one country seized another, or when two or three united.

The period of 2014-2018 was noteworthy for the number of secessions. During this period, many island groups broke away from the nations with which they had been associated as territories. Such control was often a remnant of exploration and colonization that had taken place centuries ago. When the new world government emphasized the rights of member countries, its position apparently encouraged many would-be nations to achieve their own goals.

The following is basically a condensed summary of world history from 1990 to 2030. The information is arranged alphabetically in the order of the five political blocs, or alliances. The names of countries used here are the English versions, which are in many cases not the ones used by the local inhabitants.

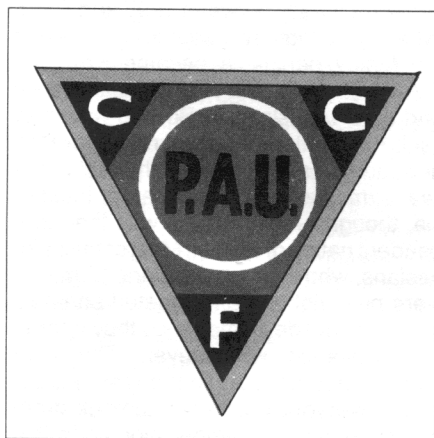


European Commonwealth

Various islands in the north Atlantic seceded from their founding nations and united to form the new North Atlantic States. Led by gallant little Iceland, they included the Faeroes, Shetlands, and

others. In similar maneuvers, the Azores & Madeira Islands (in the mid-Atlantic) pulled free of Portugal, and many islands of the Mediterranean (including Corsica, Sardinia, and the Balearics, but not Sicily) joined to form Tyrrhenia. All these new nations prospered.

The infamous Berlin Wall was removed in 2003, but by then the border between communist East Germany and democratic West Germany was ignored by most. The East was not evacuated by such freedom, as some had predicted. Monaco finally asked to join France, and was welcomed. Andorra was similarly welcomed by Spain. In a different type of maneuver, Liechtenstein allied with Switzerland, and the union called itself Suisse. Northern Ireland won its hard-fought battle against English rule and almost immediately joined the rest of the isle.



Pan-Asian Union

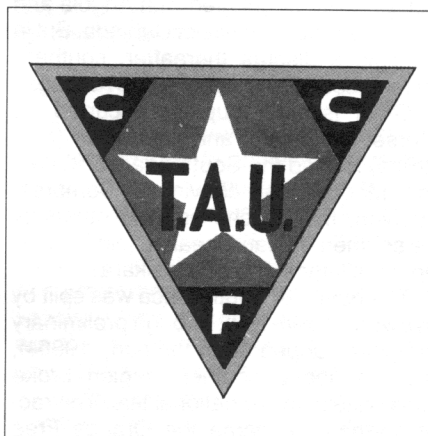
Changes were few in the two dominant nations, Russia and China. Afghanistan, Poland, and Rumania were absorbed by Russia, but the process took many years of slow assimilation and was no surprise to anyone. Meanwhile, China slowly but surely reabsorbed Hong Kong, Taiwan, and Mongolia under similar circumstances. In all cases, protests were lodged by other politically powerful nations of the globe, and some resistance was offered by the victims, but this was quite expected and did not hinder the process.

The Middle East changed significantly. Palestinians, finding no holes in the Israeli defense and eroded by years of oppression, moved into the Sinai peninsula and eventually seceded from Egypt. The latter offered little resistance, realizing that the action provided a solution for a problem that had plagued the region for decades. Israel maintained its isolation, ownership of the Gaza strip, and close ties with the United States. The last was its strongest

defense against the United Arab States (greater Syria, in practice), which gobbled up the war-torn and mismanaged nations of Lebanon and Jordan. Tiny Bahrain and Qatar joined the existing United Arab Emirates, which was complemented by the new United Hadramawt Emirates, the latter being an alliance (mostly for defensive purposes) of Yemen, Oman, and the P.D.R. Yemen.

Southeast Asia rearranged itself slightly when Laos, the only stable government in the region, successfully invaded Cambodia, Thailand, and Vietnam within a seven-month period. Only the people of the Malay peninsula escaped the Laotian maneuver, establishing themselves in the process as a new nation called Krä. It is noteworthy that the Laotian government thereafter proved itself quite capable, making much progress where once there was only strife. This success was partially because the new regime followed the lead of the regional government and emphasized the preservation of the cultures of its member states. Krä, on the other hand, has stagnated.

In central southern Asia, the large islands of Andaman and Nicobar seceded from India to protest its absorption of Bangladesh and the small Laccadive, Maldiva, and Minicoy islands. Thereafter they found that self-government can be hard work, but they survived.



Trans-American Union

The north polar region was divided by the U.S.A. and Russia, and is maintained as a research area open to all. Canada formally absorbed the tiny islands of St. Pierre and Miquelon (formerly French territories) into Newfoundland.

The United States added Midway Island to its state of Hawaii and offered statehood to Puerto Rico. The latter refused, instead becoming a dominant member of the new democratic state of Hispaniola, which included Jamaica, Haiti, and the Dominican Republic. Cuba

politely declined to join the new nation, maintaining its independence and its socialist regime.

Bermuda and the Bahamas became separate nations, breaking their last ties to Great Britain, and the nearby Turks & Caicos Islands joined in. The southeastern islands of the Caribbean followed Bermuda's lead, and formed a loose confederation called the Republics Americanas. This group included the Virgin Islands, which was until then a territory of the U.S.A. The latter considered retaking them, but decided that such actions would be contrary to the spirit of the new era.

Guatemala absorbed the nation of Belize. The coup was bloodless, mostly because the latter secretly gave its wholehearted support but did not want to reveal publicly the failures and near-collapse of its inept government.

All of the above is quite benign and minor when compared with the changes that occurred in South America. The only major war of the century was fought therein, from 2005-2009. Only four nuclear weapons were used, and they were of the small tactical variety; nevertheless, several million people died, and the politics and geography of the continent were markedly changed.

In the weeks before the war, the part of Brasil west of the Tocantins, Araguaia, and Taquari rivers seceded from the rest, calling itself Selvas. In a joint maneuver shortly thereafter, the Atlantic States (the union of Guyana, Suriname, and French Guiana established in 1997) claimed that part of Selvas north of the Amazon but east of the Trombeias, while Venezuela seized all the other territory north of the great river. Colombia and the Atlantic States then disputed the latter's claim, however. The Atlantics attacked Venezuela at about the same time as the "Selvas dispute" (later known as the Brazilian Civil War). Argentina seized the opportunity to sweep through Chile, Paraguay, and Uruguay, and tried to take southern Brasil as well. Bolivia stayed neutral throughout the conflict, and was ultimately the only country to remain essentially unchanged by the war.

Venezuela, anxious to maintain the safety of its oil industry and strengthened by backing from the U.S.A., quickly negotiated a treaty with Colombia, allowing the latter to take that part of Selvas between the Negro and Amazonia rivers. Colombia's massive preparations for war were thus unneeded to the east, and turned south, seizing western Selvas (down to the Madeira river). Encouraged by its easy victories in that region as well, Colombia then turned against its southern neighbors.

Capitalizing on Venezuela's pacifism, the Atlantics seized northern central Selvas between the Rios Branco and

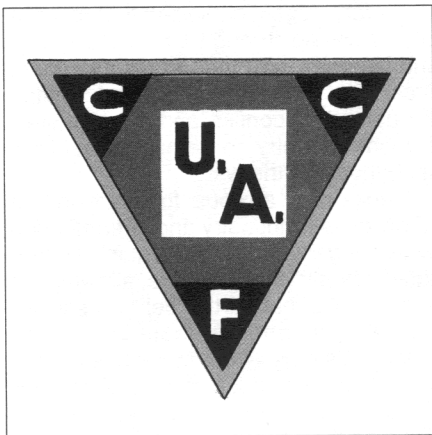
The Five Alliances

Trombetas. Meanwhile, Selvas was successfully resisting reabsorption by Brasil. The latter, severely angered by Argentina's maneuvers and seeing more likelihood of success in a southern war, achieved a cease-fire with Selvas and eventually recognized its independence, while shifting the bulk of its forces southward. Argentina was able to maintain its hold on the docile Chile, but internal dissent led to very poor performance in the east.

When the dust cleared, Brasil had taken Paraguay and Uruguay, plus all of the formerly Argentine territory east of the Paran  river. Colombia had absorbed the former countries of Ecuador and Peru, and western Selvas east to the Rio Negro and south to the Madeira. Venezuela had taken the islands of Trinidad and Tobago, and held a small triangle of land north of the Amazonas from Rio Negro to Rio Branco; the Atlantic States controlled lands from there to the Atlantic. With the loss of these northern regions, the proudly independent Selvas settled for lands between Rios Amazonas and Madeira (north and west), the Bolivian border to the southwest, and its first-proclaimed eastern border at the Rios Tocantins, Araguaia, and Taquari.

Although Trinidad and Tobago had succumbed to Venezuelan control, the other islands of the south Caribbean united and established their independence, becoming the Confederated Caribbean Territories (C.C.T.).

The Archipi lago de Col n and Tierra del Fuego were technically established as separate nations, though neither was densely enough settled to support a restaurant, let alone a ruling body. Each was declared a Wildlife Preservation Area, under direct administration by the government of the Trans-American Union.



United Afrika

Minor coups swept through most of Africa in the 21st century, but all were

relatively small and quite bloodless. The northeast remained essentially unchanged, except for the secession of eastern Libya (sponsored secretly by Egypt). The new nation was called Bangh zi.

Western Africa has always been dominated by the coast. The aggressive Moroccans intensified their claim on the Western Sahara by occupying it, and seized the Canary islands as well. As if in response, S n gal gobbled up The Gambia and the Cape Verde Islands. About the same time, Ghana absorbed the small country of Togo, and Guinea took Guinea-Bissau. But peaceful mergers occurred as well; Liberia and Sierra Leone, in a spirit of progress and friendship, merged to form a new nation they called Fr eland. And Niger, Benin (aka Dahomey), and Nigeria united as New Nigeria.

Central Africa was also a mixture of benign and violent changes. Ethiopia invaded and annexed Djibouti, and Uganda finally succeeded in a long fight to absorb Burundi and Rwanda. Following the example of other island groups worldwide, those off the central west coast united, taking the name of one of the larger (the S o Tom  Islands); they included Annobon and Bioko (Fernando Poo). In another gesture of peace, Gabon, Equatorial Guinea, and Cameroon joined the Congo, forming the new People's Republics of the Congo. Zaire negotiated with Angola and purchased the province of Cabinda. But in a religious dispute thereafter, southern Zaire seceded and called itself Katanga.

Other island groupings occurred, of course. St. Helena and Ascension (plus others) formed the South Atlantic States, and Madagascar convinced Comores, Re union, the Seychelles, and others of the southern Indian Ocean to join in forming the alliance of Madagasikara.

The nation of South Africa was split by civil war in 1990-1992 (though preliminary symptoms appeared in the early 1980s), and the liberal southern region broke away, retaining the national title. The racist northeast became the Orange Free State, and promptly annexed the nations of Lesotho and Swaziland. That situation is still turbulent, and further change is expected.

Afrika is simultaneously the world's worst problem and its best hope. Beneath its soil lie the answers to Man's distant past; in time, that information may shape the future. But within the continent's dark corners lurk the diseases, superstitions, and fears of the distant past. And yet, the great experiments — the redevelopment of jungle into rich agricultural land, the irrigation of the Sahara, and others — may eventually provide the answers to problems that occur not merely here, but throughout the world.



United Nations of Oceania

With many regroupings, secessions, and some armed conflicts, this area changed greatly between 1995 and 2010. When Laos took over southeast Asia and the Malay peninsula became Kr  (see P.A.U., page 2), the rest of Malaysia on and near the island of Borneo renamed itself Kalimantan (the local name for Borneo) and promptly invaded the rest of the island, most of which was part of Indonesia, though a small chunk was the independent nation of Brunei. Most of the Indonesians, who lived on Java and Sumatra, were busy fighting off repeated attempts by Kr  to invade Sumatra, so they offered no resistance whatsoever. The time seemed appropriate, so the rest of Indonesia (everyone east of the Lombok strait) also seceded. They limped along with little success, and those on New Guinea eventually gave up and joined Papua New Guinea, uniting their island. The smaller isles finally formed a loose and chaotic grouping called Molucca, but that will probably be reabsorbed by Indonesia in the future.

The vast number of small islands in the South Pacific grouped as Northwest, Southwest, and Eastern Polynesia, breaking their ancient ties to the Europeans. The first group included Bikini, the Marshall Islands, and Micronesia; the Southwestern group gathered most of those in the Coral Sea. The Eastern group, a very loose and disorganized federation at best, took in all the rest, reaching far across the Pacific to include even the remote Pitcairn Island.

Little changed in the south, except that the population of Australia grew by leaps and bounds, and Tasmania was granted its independence. Intensive development of Antarctica as both a huge technological research base and a water source led to its establishment as a separate nation, though it (expectedly) has fewer people per square mile than any other nation on the globe.

Playing Tips

In most types of games, players compete against each other to reach an objective. But in this and other role-playing games, players form a group, and that group strives toward the goal. Individual players do not win or lose; the *group* succeeds or fails. This is the crucial point that makes role-playing games different from all other types.

You will play the role of a CYBORG COMMANDO™ character. The fun of the game comes from playing that role, and from interacting with other players as they portray *their* characters. That's the most important part of the game — not the specific details about tactics, or die rolls, or character construction, or anything else. Some fun can come from these other elements, but if the roles are improperly or incompletely played, the game won't reach its full potential for entertainment.

The group's goals are to have fun and to succeed in reaching the specific objectives set forth in the adventures. The individual's primary goal is to improve the character. This progress occurs in the form of SP (Stat/Skill points), which are awarded to characters by the Game Master. These can be "spent" in a variety of ways to improve the character's mind, nerves, and body, and to improve or add to the character's skills. The awarding of SP usually occurs at the end of each play session, though points may be accumulated in the course of an adventure that spans many such sessions, the total being awarded at its end.

Your Game Master will reward good play with SP awards, and will discourage bad play by omitting rewards.

What is Good Play?

Since good play is the goal of both the group and the individual players, you obviously need to know what constitutes good and bad play before you enter a game. The many elements of play in a CYBORG COMMANDO game can be grouped into three general areas: role-playing, cooperation, and strategy.

Role-Playing

At the start of a game, the Game Master gives you an objective. You then display your role-playing skills as your characters pursue that goal. In an ideal

scenario, role-playing blends with action and adventure to produce an entertaining and fulfilling game. But if either element is lacking — if the adventure has too much role-playing or too much action — the game fails to reach its full potential. Individual game sessions may have more of one or the other, but the balance should be maintained in the long run.

The game can be fun as a simple tactical exercise in which your characters destroy enemy aliens, but this kind of adventure is not much more than an elaborate game of chess. A "kill-the-monsters" game will lose its appeal in a relatively short time.

If you only want to sit around and talk, playing the role of your character to the utmost, that too can be fun. But it will also lose its appeal in time, just as surely as a shallow "kill-the-monsters" game.

Consistency is an important part of role-playing. For a role to be rewarding, it must be stable and not vary widely from one session to another. If your portrayal conflicts with what is known about your character, you will certainly get no awards for good role-playing.

Cooperation

For you as players to act as a group, working together to achieve the goals of an adventure, you must cooperate. Independent actions are certainly allowed, but an overly independent style can disrupt the flow and ruin the fun of the game. A character who is a "loner" could be used in special games with only one or two players plus a Game Master, but this is not a good character type for group games.

Beware of self-protective cowardice in combat. You will become fond of your character, and will naturally want it to survive. But when this attitude becomes an overriding fear of all risk, it can in turn endanger all the characters in the group. Such actions are not in the best interests of the group as a whole, and will eventually bring resentment from the other players.

Politeness and consideration of others are basic parts of cooperation. Don't play your role to the exclusion of others; characters should interact, not give speeches. When another player is describing a character's actions, don't interrupt. If your Game Master is a good one, he or she will always be sure to get your comments before resuming the action.

And don't be too sure that you've got all

the answers. You might *think* you understand what's going on, but you probably don't know the whole truth — perhaps because of inaccurate deductions or incomplete information-gathering on your part.

Strategy

In the setting of this game, your character is a hero, working with others to save the world from the alien invaders. But your character is also a rational, thinking being, and would not perform heroic actions that would be sure to result in its own destruction. Courage must be tempered by good judgment to produce truly heroic actions.

Heroism should be combined with a sense of responsibility and duty — your character's duty to the CCF, to the other characters, and to achieving the goals of the adventure. Even truly heroic deeds are flawed when they are used to accomplish irrelevant results. Your motivations may be very good, and your actions very humane, but if they are not important to accomplishing the task at hand, they probably won't earn any rewards.

Also remember that your Game Master has spent a considerable amount of time in developing an exciting adventure for your entertainment. Though it may be amusing for you to go off on some other task, it may aggravate your GM unnecessarily. But watch for clues of such displeasure; a devious plot may require you to go off in some unexpected direction. If the GM seems unprepared — back off. You'll all have a better game.

Remember that violence is dangerous. When you start or encourage violence in real life, you can get hurt or killed. Since survival is a basic goal of all characters, avoiding unnecessary violence will be rewarded. But note that *very* important word "unnecessary!" In the war-torn setting of this game, combat is sometimes utterly unavoidable (such as in an ambush), and may be the best tool available to cope with a given situation.

Finally, try to come up with ingenious solutions for problems of all sorts. You may think of something that surprises even your Game Master. This doesn't mean silly things or gimmicks; those usually just waste everyone's time. But search for solutions beyond the logical, means other than the expected, and assets out of the ordinary.

Accessories

The following listings will give you some idea of the possible accessories you may use in your game. For specific weapon descriptions, refer to any of the excellent guides available at your local bookstore or library; some fill many volumes.

The cost and availability of any accessory is left to the Game Master's choice. Individual styles of play vary widely; some GMs will want to keep equipment expensive and rare, while others may want the converse. Items may always be found, of course, and in any condition from new (in a store or warehouse) to useless (in the field). If a certain item would help significantly in a specific adventure, it should either be given to characters at the Primary base or made available for purchase via SP expenditure. If the item is of critical importance, however, it should always be provided free, not sold.

Armor

Armor may be available as entire suits or specific parts, as follows:

Full armor: All parts in one suit.

Body armor: All but head, hands, and feet.

Body area armor: Head (all), face (front only), eyes, ears, mouth & nose, torso, all (front & back), torso (front only), arm, arm & hand, leg, leg & foot.

Any one piece of armor can be designed to protect against one or more of the following dangers: chemicals, cold, electricity, heat, impacts, lasers, light flashes, magnetism, microwaves, radiation, sound loudness, sound vibration.

Weapons

Grenade: A small missile containing explosives, possibly with other substances.

Gun: A device that can hurl a projectile of any sort directly at a target; may involve recoil or be recoilless.

Laser (Light Amplification by Stimulated Emission of Radiation): A device that projects a beam of coherent light.

Launcher: A device that propels an object at a target indirectly, or provides stability so that a rocket may accurately propel itself.

Maser (Microwave Amplification by Stimulated Emission of Radiation): A device that projects a beam of coherent microwaves.

Missile: Any projectile or thrown weapon.

Particle Beam: A beam of alpha, beta, gamma, or other atomic particles.

Projectile: An object hurled directly at a target.

Rifle: A gun that causes a projectile to rotate (for stability during trajectory) upon leaving the barrel.

Rocket: An action-reaction propulsion motor, or a missile or vehicle propelled by same.

Sonic: A device that produces sound. The intensity can vary widely in effect. Low power has a mental effect (irritation or fear), medium power causes physical damage from molecular vibration, and very loud sound can cause physical displacement (a shock wave effect).

Stattor (short for Electrostatic projector): A device that creates and/or emits an electrostatic charge.

Thrower: A device that hurls a substance (rather than a projectile), such as:

Flame thrower: Emits burning or flammable solids, liquids, or gases,

Icer: Emits supercold liquified gases (nitrogen being the cheapest and most common),

Acid: Emits acid (limited use, due to scarcity of ammo).

Special Effects & Abilities

The following effects may be applied to almost any type of missile, given sufficient technological resources:

Armor-piercing

Attaching (probably with very thin trailing line)

Chemically treated (poison, fire retardant, tranquilizer, gas effects, etc.)

Electrically loaded/charged (including programs for electronic targets)

Explosive (light, medium, heavy)

Fragmentation

Gas (tear, knockout, nerve/paralysis, nerve/deadly)

Liquid payload

Noisemaking (in flight)

Noise-releasing (after impact or timed)

Self-propelled (for longer range)

Shaped (for travel through specific environments, air, water, solid)

Smart (programmed, self-aiming, and/or self-firing; will either communicate with programmed gun for timing and aim or be target-seeking; might take evasive action, follow odd, unpredictable trajectories, seek targets, relay information, and so forth).

Smoke (normal, hot, radioactive)

Splitting (comes apart in flight)

Weapon Damages

Hand-held weapons usually inflict fixed damages ranging from 1 to 20 IPs. Your GM will decide the amount of fixed damage for a given weapon. If variable damage is desired, roll a d10 and add a bonus if your GM deems it appropriate. For example, a rifle might inflict 6-15 points; roll a d10 and add 5 to the result to determine the damage. As a general guide, remember that a typical adult civilian has about 20 IPs (or 30 total IPs in the advanced game, divided amongst body parts). Fixed damage amounts may be estimated according to the possible effects of a particular weapon on such a person. Weapons with unusual effects, such as tranquilizers, typically inflict only 1 to 5 points of damage.

Large and heavy weapons normally inflict standard (d10x) damage, and damage bonuses of 5 to 50 points may be added at the GM's discretion. Very large and very fast missiles may have even higher bonuses; for example, a shot from a large cannon might inflict as much as d10x plus 100 points.

Effects that fill a volume or otherwise affect multiple targets may inflict full damage on all targets, or, depending on the effect, damage penalties may apply to all targets except a single central one. For example, an explosive grenade might inflict a full d10x damage to a victim immediately beside it when it goes off, but 20 points less to all others within 3 meters/yards, 40 points less to those between 3 and 6 meters/yards, and so forth. A machine gun burst, on the other hand, might inflict full d10x damage to all targets within a given area.

Weapon Types by Skill Areas

230. Personal Weapons

231. Ancient bladed melee weapons: axe, bayonet, knife, combat knife (dagger), bladed pole arm, sword (long, short,

or two-handed).

232. Ancient blunt melee weapons: blackjack (cudgel), chain with ball(s), thin club (stick or staff), thick club, flail, mace, mallet (maul).

233. Ancient missile weapons: artillery (ballista, catapult, trebuchet), small axe, box, crossbow, sling, spear (short, long, javelin, trident).

234. Common devices as weapons: Chain (and related ancient weapons), pipe, rope (lasso), tools (saw, drill, screwdriver), whip, wire (including garrote).

235. Modern small arms: grenades (various types), one-hand laser ("pistol"), two-hand laser ("rifle"), mounted laser ("cannon"), sound projector (for stun or damage), radiation sprayer (gamma particles, microwaves, or X-rays), projectile guns (automatic pistol, revolver, rifle, shotgun, submachine gun), specialty gun (powered grappling hook, tranquilizer pistol or rifle), throwers (fire, cold substances, or acid).

236. Heavy and Special weapons: machine gun (light, medium, heavy), mortar, rocket.

237. Artillery: cannons, mounted guns, howitzers, rocket artillery.

Personal Weapon Skills

The Game Master may require a player to specify a single weapon when purchasing a personal weapon skill. To apply such a skill, use the following procedure.

Normal humans: Divide the Skill Rating by 5 and round down to the nearest whole number. Subtract that result from the

normal Combat Rating ("miss roll"). The total is the revised CR when using that weapon. The CR can never be less than 1 (i.e., there is always a 1% chance of a clean miss) except in special circumstances, such as attacking an unprotected target at point-blank range.

CYBORG COMMANDO characters: As above, but divide by 10 instead of 5. CCs improve at a slower rate than normal persons because they gain MadMac assistance in aiming, so skill has correspondingly less effect on the attack probability. In the event of MadMac failure, use the procedure for Normal Humans, but remember that the character's CR is 30 (-20 penalty for lack of MadMac assistance).

Equipment

Various standard equipment may be needed during the course of adventures. Special types are listed below; more common types may also be available at the GM's discretion.

Vehicles

Though most vehicles can easily be placed within the skill system, the following additional notes may be helpful. When developing the details for any vehicle, specify the following: length, width, height, speed, range per fuel unit, IPs by location, built-in weaponry, crew complement, and maximum number of passengers. DV bonuses to crew and passengers, considered with respect to each of the five basic attack forms, should vary by the construction of the vehicle and the amount of cover provided.

131. Landcraft, small: includes ground automobiles (compact, small, medium, or large), hovercars, bicycles and motorcycles, carts, jeeps, vans, and armored cars.

132. Landcraft, large: includes bus, hovertruck (cargo vehicle), and hovercraft (large vehicle for cargo and passengers).

Other Equipment

Communications & Optical Devices

- Camera, film
- Camera, video
- Binoculars, normal
- Binoculars, range-finding (may combine with others)
- Binoculars, infrared
- Binoculars, ultraviolet
- Comm unit, radio
- Comm unit, laser
- Comm unit, A-V
- Comm scrambler
- Goggles (eye protection only)
- Goggles, amplifying (ambient)

- Goggles, infrared
- Goggles, U-V
- Microphone, standard
- Microphone, miniature (tracer or bug)
- Microphone, parabolic
- Ministudio (audio-visual)
- Sensor: incorporates various scanning modes (IR, UV, etc.)
 - headband sensor (using goggles)
 - helmet sensor (using binoculars)

Medical

- First aid kit
- General medical kit
- Field surgical kit
- Laser scalpel
- Minihospital kit
- Minilab (for chemical analysis)

Personal Miscellany

- Carryall bag
- Flashlight
- Handcuffs
- Lantern (50' rad)
- Rope, 100'
- Wristwatch (with alarm)

Protective equipment

- Airmask & oxygen bottle(s)
- Diving gear, light (facemask, fins)
- Diving gear, heavy (SCUBA)
- Radiation suit
- Vacuum suit

Robots

- Agricultural
- Construction
- Industrial (factory type)
- Personal service (valet, waiter, etc.)
- Security (police 'bot)

Sensors/scanners

- Dosimeter (radiation)
- Infrared (heat/cold)
- Microwave fence generator
- Motion detector
- Radar/sonar scanner
- Radar detector
- Sound enhancer/filter
- Smell enhancer/analyzer
- Wide-angle vision (180°, 270°, 360°)
- X-ray machine, portable

Tool Kits

(each contains spare parts & disposable necessary tools)

- Cutting & welding kit
- Electrical kit
- Lockpick set (12 pieces)
- Lockpick, electronic
- Mechanical kit

Travel Equipment

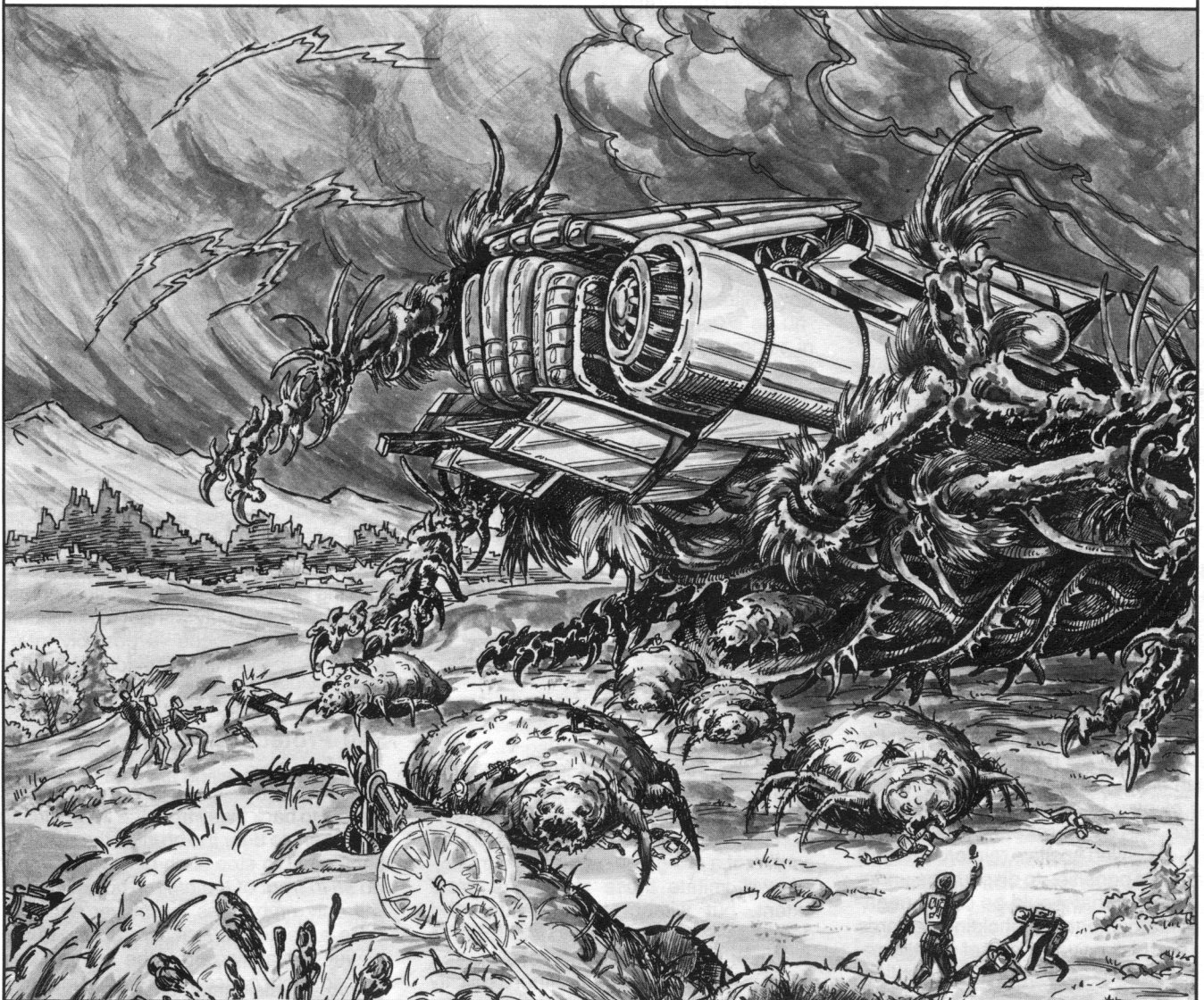
- Backpack
- Campkit (butane stove, messkit, and accessories)
- Canteen
- Flashlight
- Sleeping bag
- Sunglasses
- Tent
- Trip/puter (includes recorder, compass, etc.)
- Water jug



CYBORG COMMANDO™

SCIENCE FICTION ROLE-PLAYING GAME

GM's Adventure Notes



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by Gary Gygax,
Frank Mentzer,
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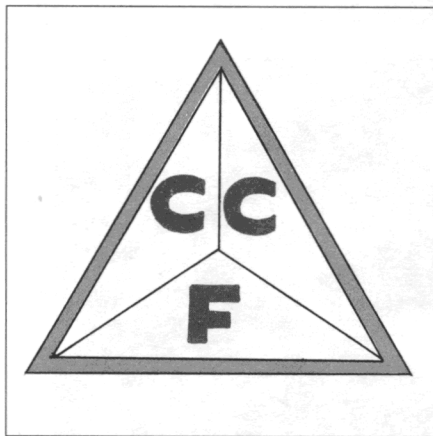
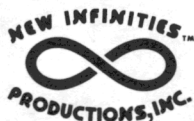


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Running Your Game

Before you read this section, look through the "Playing Tips" in the other half of this booklet.

The players' specific short-term goal is acquiring SP. The characters progress when you, as the Game Master, award SP (Stat/Skill Points) to them.

By awarding SP, you directly affect the style of play. You reward play that you want to encourage, and discourage other types of play by omitting rewards. This practice — that is, offering rewards as goals — is called positive reinforcement. If you applied penalties to discourage undesired actions, that would be called negative reinforcement. Withholding rewards when bad play occurs is part of positive reinforcement; no actual penalty is applied.

Good Play

The many elements of play in a CC game can be grouped into three general

areas: role-playing, cooperation, and strategy. You should be familiar with all the details given on these aspects in the players' notes.

Role-Playing

Role-playing is an art form. The best role-players in the world can be found among the actors and writers of professional stage and film productions. In the course of a CC game, you and your players will imitate those skills to a great extent, but without the pressure and demands of those professions.

When you start a game session, you will give the players a goal, either explicitly (simply by describing it) or implicitly (by describing a situation in which the goal becomes obvious). In dramatic terms, you provide the plot. The players then display their role-playing skills as their characters pursue that goal. In this ideal adventure, role-playing blends evenly with action-

adventure to produce an entertaining and fulfilling game. These two elements must be in balance; a play without a plot is only meaningless dialogue — possibly interesting for a short time but doomed in the long run.

Self-Protective Cowardice

If you notice that one player always seems to back away from the fight, forcing the others to bear the brunt of the risk, you should act to stop such behavior. *Do not do so in front of the others*, however; that will only embarrass the player and produce a defensive reaction. Speak to the player privately, after the game, and mention your concern in a helpful manner. Explain that such actions are not in the best interests of the group as a whole, and will eventually lead to resentment from the other players. That won't solve the problem, but it will open the door to communication, and a solution may be found thereby.

Cooperation

You can encourage politeness and consideration of others in your campaign simply by indicating who should speak first — who “has the floor,” to use a common term. Pay attention only to that person, and generally to one person at a time, until all have had their say. If others interrupt, tell them to wait — but be *sure* to get back to them. If you do, they'll begin to trust you and wait their turns; if you don't, they'll keep competing for your hard-to-get attention. If one person is dominating the game, encourage the others to participate more by asking each one for actions, responses, and so forth.

An important part of player cooperation involves your actions as Game Master. You will naturally do the best you can in running the game, but sometimes you will make mistakes. When you or the players catch such an error, simply admit it — nobody's perfect — and correct it. But if the players think you're wrong, and you know that you're right, stick to your position, and don't explain why.

This situation can easily arise when the players *think* they know what's going on, but they actually don't. Don't encourage arguments on this topic. If you are consistent in admitting your errors when they occur, but sticking to your position when you're right, the players will learn to trust you and cooperate with you.

Strategy

When characters wander off from the adventure you have prepared, try to offer logical ways that they can return to the main objective. The players should take the hints, though you may be forced to present these clues in a manner that is less than subtle. But guide them gently; as they improve and become more experienced, they will learn to respond to subtlety.

After you have described a game situation to the players, someone may suggest an idea or action that is clever, innovative, or just plain brilliant. Reward such quick thinking and you will see more of it as time goes on. If you find yourself hard-pressed to keep ahead of the players' ingenuity, enjoy the feeling! It is one mark of excellence in a role-playing game.

Simple success or failure is definitely a factor in player enjoyment. Take care not to stress success above all else, however, or you may see the other elements diminish in importance as a result.

Death & Replacement

If a character dies, someone — either you or the player — has probably made a

mistake. Unlike a film or play, in which a character may perish in the course of the plot, the fun of a role-playing game comes from participation, not merely observation. Though part of your job as Game Master is presenting challenges, you should normally give the characters a way to survive, and, preferably, to succeed. This often involves carefully setting the amount of danger (i.e., the force of the enemy) at a level that characters can handle. If the enemy is very powerful, you should be sure to reveal this in some way, so that the characters can avoid placing themselves in a sure-death situation.

When a player decides to risk danger to help others, but errs in estimating the risk and thus seriously endangers his or her character, it becomes *your* job to prevent that character's death. Such actions may mean that something is wrong with the adventure or with your description of the situation.

Sometimes characters will die despite good planning and good play. The reasons could be any of a variety of things: the player may have tired of the character, there may be no way out of a trap situation, or a run of bad luck may cause too many sequential failures. When that occurs, encourage the player to start a new character and keep playing.

To prepare for this eventuality, you might allow every player to have an unplayed but fully developed character in reserve. If the player starts to use both characters in different parts of the campaign, still another should be created. If a character dies, the spare can then be brought into the game as quickly and smoothly as the player wishes.

As the characters earn SP and thereby achieve higher Stats and Skill rankings, consider allowing similar gains for the reserve characters. Their gains should always be less than those earned by characters in play. As a general guideline, don't allow any reserve character to have a Stat or Skill rating as high as that of any normal character. But envision those reserve characters as real, functioning parts of the campaign who simply don't happen to be the focus of attention. Their gains, though minor, will keep them “alive” in the background, and result in better compatibility with the more well-off characters when the reserves must be brought in.

Awarding SP

Reward your players when they and their characters perform the following actions in the course of the game:

Role-playing properly — consistently, with depth, and in proper balance with the action-adventure elements

of the game
Cooperating with other players, and with you
Acting heroically, but tempering this with good judgment, responsibility, and a sense of duty
Avoiding unnecessary violence
Achieving a goal successfully
Suggesting ingenious solutions to problems

You will usually award a number of SP to each character at the end of each game session. Alternately, you may keep track of all the points earned in the course of a long adventure that spans several game sessions, and award them at the end of the whole scenario. If you choose the latter, you should reveal the approximate amount of SP that may be earned overall (but not guarantee it, of course), to encourage the players and maintain their interest in the greater goal.

A basic character should earn 2-6 SP per game session; an advanced character, 5-15 SP. The points can normally be “spent” as the players wish, for improving either Stats or Skills. If you award less than these amounts, players may become discouraged by the lack of progress. If you award more, they may become bored with rapid gains for little effort. Each character should receive a total award within 1-2 SP of every other. The only exception occurs when someone has played exceptionally badly. The similarity of the awards will help the players feel that they have been a team, and the minor variations will show them who did the best overall. However, if you allow a mix of character types in a single game (combining basic and advanced characters), be sure that the advanced characters receive, on the average, about three times as many SP as the basic ones. Explain the reason to the whole group — advanced characters have three times as many Stats and Skills to cope with.

If you wish, you may consider the six categories of rewards noted above — role-playing properly, cooperating, acting heroically, avoiding unnecessary violence, and making ingenious suggestions — and use them as a basis for calculating a total award. For basic characters, 0-1 SP would then be awarded per category, or 0-2 SP each for advanced characters. If you “rate” each player in this way, however, you should not openly reveal the details unless the players are mature enough to benefit by them. Beware of inciting arguments such as, “I played as good as he did!” and the like. Charges of unfairness and favoritism can ruin all the fun of the game. If you are not sure what the result of revealing your ratings would be, try doing so privately to each player and see what happens.

Creating Adventures

Whenever you design an adventure for your CYBORG COMMANDO™ game, use the following checklist to be sure that you have accounted for all the necessary details.

Time

In addition to the timekeeping needed during an adventure, you should always keep track of the game date as well. If you keep careful records, the campaign will form a coherent whole; otherwise it degenerates into a confused collection of events.

When the characters are assigned a mission, they should be given an estimate of the time, both in the game and in actual sessions, needed to complete it.

Place

The location of the characters during their mission briefing will normally determine the starting place. The site of the actual mission may be nearby or far away, but that should always be revealed during the briefing. The mission may end either at the same place as the briefing or at another base, possibly setting up another scenario thereby.

Principal figures

In addition to the CCs, a wide variety of creatures and other characters may appear in the adventure. Consider the following types, and set up details for all that apply. Make a few notes on personalities for better role-playing, and for any that may be encountered in combat situations (whether as allies or opponents), be sure you generate IPs and DVs. You should also determine the locations of all concerned and decide their movements during the adventure.

Other CCs

- Humans at the base (CCF staff & visitors)
- Humans encountered en route to and from the mission objective
- Humans involved with the objective
- Enemy Xenoborgs
- Other preselected opponents

Mission objectives

The goal of the adventure should be revealed to the players, of course, though it might be changed along the way via a courier or a broadcast signal. The objective is often very general, leaving the exact method of operation open for the characters to choose once they have observed and analyzed the specific situation.

It is important that each mission have a specific objective, and that the goal be worthwhile within the context of the campaign. *Your* purpose for running the adventure may be something entirely different, however. For example, the mission may seem routine at first, but the problems and events that you introduce may be designed to reveal some critical bit of information, or to give the players experience in some specific ability.

Mission priorities

The standard priorities for all missions are as follows, given in order of importance.

1. Minimize the amount of knowledge about CCs revealed to the Xenoborgs in the course of the mission.
2. Maximize the chances of survival of all CC participants.
3. Accomplish the mission goals.

Situation Summary

The characters are not merely sent off to reach the objective; they are also given as much related information as possible. HQ may decide to limit the scope of such information, but the details revealed should always include the following categories.

Overview & General Notes: This summarizes the overall situation, usually in great detail. Recent actions of the allies, opponents, and others in the area of the mission objective are normally included.

Obstacles & Dangers: To maximize mission success, HQ must forewarn the characters of the predictable danger areas. Of course, in most missions, numerous other dangers are encountered as well.

Havens: Areas within the adventure

settings that seem relatively safe from Xenoborgs are designated, as are the locations of CCF agents with whom contact may or should be made. Checkpoints are often set up for critical missions; in such cases, the CCs are required to contact a local CCF operative (a normal human, not a CC) and provide an update on the mission status.

Mission plan

HQ usually offers a plan for the mission, sometimes in very minute detail. The chance of mission success is maximized if this plan is followed exactly — but this is rarely the case, since the unexpected always seems to disrupt it. Critical points during the adventure are often mentioned in the mission plan. For example, certain locations may be highlighted as "Extreme Danger" areas, indicating active Xenoborg presence and/or great risk. Contingency plans may be included to cover the alternatives at such points. The characters' MadMacs can evaluate any revisions to the initial plan that the CCs may be considering and recommend which of several alternatives has the highest chance of success.

Mission chronology

If the mission plan is set forth in great detail, it may be accompanied by a specific description of each "leg" — that is, each change of route, each expected confrontation, and so forth. A chronology should include the estimated time required, degree of danger, and other notes on each leg.

Maps

Last but not least, a detailed map of the mission area is always given. In some cases, the amount of detail may be limited to that of the available resource (i.e., the maps you provide). For example, an adventure set within the United States should be accompanied by a road map at least, and possibly local maps as well; but if the adventure is in the depths of South America and you only have a continental map with little detail, that will have to do.

Getting Started

The first thing you need is a Primary base at which the characters will begin (and probably end) their adventures. You may find it easiest to use the Primary that is closest to your real home, since you are already familiar with the area. Refer to the base listing in the Campaign Book to find the appropriate Primary. A summary of the possible starting places in America is given at right.

If your chosen Primary base was depopulated during the invasion, find its replacement, which will normally be one of its Secondary bases, in the Campaign Book base listing. In this case, your first adventures may even involve the transfer of crucial materials from the former Primary to the new one. You may also wish to have the depopulated Primary reactivated. However, this requires great care on the part of those stationed there, since most of the city will be empty, a radiation hazard may exist, and other unusual dangers are ever-present.

Remember that all military bases were destroyed, not merely depopulated, in the invasion. The anti-matter bombs used resulted in craters (or new bays) where these installations once stood.

Maps

Since every adventure has a setting, and since the game setting is Earth itself in the near future, current maps should be quite adequate for your needs, albeit with a few modifications. Normal road maps are relatively inexpensive, and can be used by both you and the players. An atlas may provide even more information, and such may be crucial for adventures set in nations other than your own. Your local library will probably allow you to photocopy pages from the atlas at minimal cost. If you decide to take advantage of this, make two copies — one for you to plan and mark, and one for your players.

Check the "Post-Invasion" section of the Campaign Book to see if any cities in your starting area are either depopulated or occupied. For depopulated areas, follow the guidelines given for calculating the new populations. Mark your maps accordingly for general reference. At some point, you should specify the location and number of Xenoborg troops in such areas, though you need not do that now unless one will be the site of an early adventure.

Calculate the revised populations in the year 2035 for all the towns and cities in which the first few adventures will probably occur. You may find it convenient to calculate such details for everything within a certain range of the Primary base.

The maps provided in your Campaign Book show the locations of all the CC bases worldwide, as specified in the base listings. (Invasion losses are ignored on those maps.) On your own maps, mark the positions of the bases that are within your starting area.

Now be creative — make whatever changes you like in roadways, city sizes, and so forth. You may also wish to add new developments, such as nuclear power plants, industrial areas, new housing tracts, etc.

Complete the picture by adding the locations of Xenoborg outposts and actual Teleborg bases. It may also be helpful to plan approximate schedules for roving Xenoborg squads, since such reconnoitering would usually follow a fairly rigid timetable.

Changes

As your campaign develops, remember that the situation is volatile and ever-changing. Teleborgs land and become bases, and Xenoborg squads may be redeployed after completing their initial assignments.

The seasons bring change as well. The invasion takes place in January, which is early winter for the northern hemisphere but early Summer for the southern. As time passes in the campaign, the mood of many northern residents will brighten with the days. Those in the southern latitudes will simultaneously begin their preparations for a long and dangerous winter.

American Starting Areas

If you live in the United States, start your campaign in one of the following areas. You should pick the one closest to (or even coinciding with) the area in which you live. That will make your initial tasks easier and add impact to the game. If you instead want to choose a starting area because of specific terrain features, these details are also included.

West

Base: Replacement for San Francisco Primary (suggested: Big Sur Secondary)

Water: Pacific Ocean, San Francisco Bay
Cities: San Francisco, Oakland, San Jose, Sacramento

Other settings: Rugged rocky coast, dense woodlands, inland croplands

Central, north

Base: Replacement for Chicago Primary

(suggested: Manitowoc, WI Secondary)

Water: Lake Michigan, Mississippi River (& lesser rivers), small lakes

Cities: Chicago, Peoria, Springfield, Milwaukee WI, St. Louis MO, Evansville IN

Other settings: Primarily cropland, some woodlands in southern area

Central, south

Base: Corpus Christi Primary

Water: Gulf of Mexico, major bays (Galveston, Lavaca, San Antonio, Corpus Christi, Vermillion), coastal lakes (primarily in Louisiana), Sabine River, Mississippi River, coastal swamp & marshes, bayous

Cities: Houston, San Antonio, Beaumont, Baton Rouge, New Orleans

Other settings: Shrub & sparse grazing lands, some cropland & sparse woodlands

Eastern, north

Base: Replacement for Boston Primary (suggested: New Bedford Secondary)

Water: Atlantic Ocean, Cape Cod bay, other major bays (Buzzards, Narragansett, etc.), small lakes

Cities: Many (Providence RI, Hartford CT, Portland ME, Albany NY)

Other settings: Cropland, light & dense woodlands, plus branches of the Appalachian mountains

Eastern, South

Base: Replacement for Cape Canaveral Primary (suggested: Bayport Secondary)

Water: Gulf of Mexico, Atlantic Ocean, small lakes

Cities: Miami area, Orlando, Tampa/St. Petersburg, Jacksonville, Savannah, Atlanta, Charleston

Other settings: Croplands, woodlands, some grazing land, swamp & marsh

First Adventures

For impact and realism, bring the early action from the starting base into your home town. You should know the area well, so your job will be simpler than it would be for developing any other region; also, detailed maps should be very easy to find. Remember to modify your town to reflect developments of the future.

To practice the details of the game, run a few simple fights with aliens in your home town. One or two roving Xenoborgs might menace some important area in or

near the town, such as a reservoir, utility company, or even a shopping mall — they might be curious about Man's culture as represented therein. The characters' goals are simple — destroy the invaders or draw them away from the town.

Campaign Development

Once you and your players have learned the game system, start expanding the campaign from its two starting points — the Primary base and your home town. The area between them can be explored, as can other surrounding territory. A survey of a given area can always serve as an occasional mission objective, though more specific goals should be the norm. By inserting clues and details within these explorations, you can guide the characters to other adventures. A few suggested plot lines are given below (Specific Adventures).

From the local area, expand to other nearby but out-of-state areas, then to far-off parts of the same nation. International adventures are a primary element of most successful campaigns, as these offer new and exotic locations, people, cultures, and so forth.

The campaign need not expand in a strictly logical order, to nearby nations, distant nations in the same regional bloc, and then to other blocs; let your interests, and those of your players, be your guide. Find maps, do some library research, and develop adventures anywhere on Earth. Bases and CCs can be found the world over, providing convenient starting points for any adventure you care to develop. Pictures can be very effective in building the mood of an unfamiliar setting, so keep watch for photographs (in magazines or other sources) that correspond to areas you plan to develop. The old adage that each is worth a thousand words holds quite true for this game.

Specific Adventures

The following are brief descriptions of plots for you to develop into adventures. You are free to choose the setting, time, and so forth. Follow the guidelines given on page 3 to be sure you create all the additional details needed. The adventures are presented in approximate order of difficulty. However, the challenge of each will be determined to a large extent by your additions and development.

Simple:

1. Power Up
2. Save the Scientists
3. Information, Please

4. Roundup
5. Powwer Play
6. House Call
7. Cache for Credit
8. Ice World

Tricky:

9. Doomsday or Bust
10. Hawaiian Holiday
11. Guard Duty
12. Child's Play
13. Raiders' Revenge
14. Tour Guide
15. Casting Call

Tough:

16. Secret Source
17. More Information, Please
18. Trouble with Traitors
19. Mute Macs
20. King Jack & Queen

Simple Missions

Simple missions have straightforward goals and involve standard combat.

1. Power Up

Situation: Certain vital supplies are kept in a special vault that has a "guard computer" and an independent self-destruct system. The Xenoborgs have cut off the central power supply, so the supplies can't be reached. The self-destruct will activate if any attempt is made to break in, or if the computer is reawakened by any means except normal power.

Objective: Reactivate the exterior power supply and keep it on until the obstinate and suspicious computer can be convinced to release its treasures.

Other notes: Turning the power on will probably attract Xenoborgs, but only one or two roving types. That action may also start a few fires in homes where electrical appliances were left on. The guard computer is very hard to convince, since its usual contacts are no longer alive.

2. Save the Scientists

Situation: Important scientists are trapped in or near an area that is now tightly controlled by Xenoborgs (or in a depopulated area, having survived in their underground lab).

Objective: Sneak into the area, find the scientists, and bring them out safely.

Other notes: One elderly scientist has a heart condition and can't take strenuous activity. The best scientist, who is quite arrogant, and the designated group leader are waging a little war for control of the group. Aside from the constant Xenoborg threat, local animals, disease, and other factors endanger the mission's success.

3. Information, Please

Situation: A CCF Command base wants to get more information about Xenoborgs and their operation in a nearby major city. The characters are assigned to monitor them closely.

Objective: Penetrate the area, get close to the aliens, and retrieve as much information as possible.

Other notes: The characters must quietly remove occasional wandering Xenoborgs that find them. They will see Powwers and Base-Teleborgs as well as Xenoborgs, and may get details on them all. Their information should include alien combat capability and weaknesses if possible, and some fighting is thus necessary — but at the wrong place or time, combat could attract far more attention than the characters can withstand.

4. Roundup

Situation: Assorted animals (notably carnivores) released from the local zoo by the aliens are threatening humans in a large nearby city.

Objective: Find the dangerous creatures and either collect or destroy them.

Other notes: Xenoborg computers have been implanted into some of the animals (both carnivores and others), and many are now tools, acting as passive observers and as attackers. Apes may build traps for the CCs, docile herbivores may watch and report the characters' every move, and so forth. A small hidden Base-Teleborg to which the creatures report electronically occupies a woodland lair; the CCs might pick up signals, sort out the benign and dangerous creatures, and even destroy the alien base. No Xenoborgs are directly involved.

5. Powwer Play

Situation: Having recently learned of the Powwers, a CCF Command base wants some brought in for examination.

Objective: Capture & return with as many Powwers as possible.

Other notes: Characters must track a Xenoborg squad, starting some fights but keeping casualties minimal — thus causing extensive Xenoborg power use. They should then follow their prey and wait for the Powwers to be spread out in pools so they can recharge during daylight. The characters must attack when the time is right, collect the Powwers and return.

6. House Call

Situation: A hospital in a depopulated area must be looted for supplies, including medicines, tools, and complex machines.

Objective: Penetrate the area, find suitable transportation for the cargo, load it up, and get away undetected if possible.

Other notes: Characters must cope not only with roving Xenoborgs, but also with humans who have survived the depopulation — mutations, crazies, well-meaning people who get in the way, and so forth. The return trip can be a bit tricky, depending on the vehicle(s) used. Note that moving vehicles do not automatically draw Xenoborg attacks once the invasion itself is over.

7. Cache for Credit

Situation: Roving Xenoborg squads are very close to discovering a secret military cache of major weapons.

Objective: Either distract the aliens or move the cache.

Other notes: Distractions are only temporary; the Xenoborgs approach relentlessly, returning to their search pattern after any interruptions. If the squads are wiped out, they are quickly replaced by more cautious and possibly more numerous groups. Once the cache is safe, the CCs are given command of the military outpost, and can use some of the heavy weaponry to wipe out the aliens. However, the relocation (which involves several vehicles, including tanks) must proceed apace, before alien reinforcements arrive.

8. Ice World

Situation: The CCF is constructing a major base in Antarctica, having discovered that the Xenoborgs don't like cold.

Objective: Escort supplies to the new base, and assist in its construction and defense.

Other notes: The escort involves overland travel in South America and underwater work. Each task has its share of unique features. The Antarctic terrain can be shaped with relative ease, and the base is built at a hidden location deep beneath the ice. Xenoborgs may locate it, and fighting occurs within the ice tunnels.

Tricky Missions

These adventures usually require clever and astute play if the dangers and traps are to be successfully avoided. Negotiation is often involved.

9. Doomsday or Bust

Situation: The members of a religious cult plan to march on an alien base and

exterminate the Xenoborgs there by sheer force of will.

Objective: Convince cult members of the futility of the plan, and prevent their destruction.

Other notes: The leaders of the cult (but not most of its members) believe that the end of world has come and there is no point in living. They know they will be destroyed, and their announced goal is fraudulent. They see the whole situation as the fulfillment of prophecy. The CCs must remove occasional wandering Xenoborgs while they manufacture delays and try to discover the secret motives of the cult leaders.

10. Hawaiian Holiday

Situation: A few Xenoborgs are examining the Mauna Loa volcano to see what makes it go. They seem to be planning to affect it in some way.

Objective: Stop them, but in such a way as to discourage the higher ranking Xenoborgs from merely sending replacements.

Other notes: Not only is the local CCF research base endangered, but tampering with the volcano may result in the biggest eruption of any volcano in history, producing a shift in the Earth's crust (moving the tectonic plate). The CCs must allow the Xenoborgs to keep communicating with their superiors, but cause events that result in the creatures' destruction by natural means, such as releasing lava flows, so that the experiment will be written off as a failure rather than a defeat.

11. Guard Duty

Situation: High officials of the Trans-American Union are going to have a secret conference to discuss the survival of Mankind.

Objective: Guard the conference site and its attendees.

Other notes: A rebel underground in the nation you select for the conference wants to seize power, and thus plans to assassinate the officials. Some normal guards, waiters, and other personnel are members of the underground, but others are perfectly normal. The characters must sort them out and remove the rebels — and must also defend against a rebel attack. The toughest part is that any combat must be kept very quiet to avoid drawing the attention of Xenoborgs.

12. Child's Play

Situation: Children are being rounded up by Xenoborgs and taken to a base.

Objective: Rescue the hostages without endangering them.

Other notes: The collection site is a small Base-Teleborg, but the children are kept in a building nearby, under heavy Xenoborg guard. The fight is tough, as expected, but the CCs succeed. One child has been processed and is under the control of a computer* implant, and his behavior is slightly odd. The computer can be removed easily once the problem is identified. But another child also carries an implant, and this one behaves perfectly normally. The enemy watches through her, and follows the characters as they head for home. Various mundane hazards arise en route, enough to make the adventure seem normal. But if the CCs don't pick up the very subtle clues to the existence of the other implant, the Xenoborgs will track them back to the hidden CCF base and mount a massive attack.

13. Raiders' Revenge

Situation: CCF supply missions regularly travel a certain route, moving supplies from a city to a secret rural depot. Someone starts very effective raids on the Xenoborgs nearby. If Xenoborg interest in the area increases, the CCF missions will be jeopardized, and the uninformed freedom fighters may also be wiped out.

Objective: Find this rogue group and stop the raids.

Other notes: A paramilitary group of civilians in the area has a hidden base, and is conducting the raids. To make contact, the CCs must first find them (a tough task), and then survive first contact, since these folks usually shoot first and ask questions later. The raiders must be convinced to redirect their operation, even though it seems entirely successful. They may require supplies and assistance in moving elsewhere.

14. Tour Guide

Situation: A high-ranking political VIP insists on touring a Xenoborg-controlled area.

Objective: Escort and protect the VIP — under his command.

Other notes: The CCs must cope with silly orders while keeping the VIP safe in firefights. They get cornered by a major Xenoborg effort that finally scares even the VIP and must figure out how to escape. The VIP's senior aide is a Xenoborg agent, a traitor who has cut a deal with the invaders. The tour was his idea, and the whole operation is a trap to capture the CCs.

*The computer implant is disguised as upper teeth, and appears normal to all scans.

15. Casting Call

Situation: The CCF wants a Hollywood special-effects genius to assist in the fight against the invaders.

Objective: Enter the abandoned Los Angeles area, then find and retrieve this person.

Other notes: The genius has built a cult of people who revere the past glory of the film industry. They all live in the production lot of a major film producer. Illusions and special effects galore are scattered throughout the adventure, which takes places in the varied settings around the lot. The CCs must kidnap and escape with the genius, who is the leader of the cult, evading his irate followers in the process.

Tough Missions

Tough adventures involve very hazardous situations, and require astute play and imaginative solutions to problems.

16. Secret Source

Situation: A Xenoborg base in one of the great lakes (underwater) is producing many reinforcement troops.

Objective: Find and destroy the base.

Other notes: A frontal attack on a medium or large Base-Teleborg can be tricky, and this one is exceptionally so because of the underwater setting and the presence of many immature Xenoborgs. This is essentially a very complex tactical adventure.

17. More Information, Please

Situation: A CCF Command base wants more information about Xenoborgs, and the scientists have a new plan.

Objective: Operate a fake Xenoborg (actually a vehicle) and infiltrate an alien base.

Other notes: Humans may attack the fake Xenoborg, so until the CCs near the alien base, some must remain outside the device while others ride within and operate it. All the characters will then climb in before nearing the base. The device is cleverly made, smelling and sounding exactly like a real Xenoborg. Eventually, after the characters examine the inside of a Base-Teleborg and gather much important information, the ruse is discovered, and the CCs must fight their way to an escape.

18. Trouble with Traitors

Situation: Human traitors are dealing with Xenoborgs. Their organization is

secretive, and they make only occasional visits to their masters.

Objective: Find the human traitors; capture some and eliminate the rest.

Other notes: CCs must keep a Base-Teleborg under observation until a human arrives. When he leaves, they follow and gather details about the traitors' organization. If they can find enough details and recover certain records, they find that the trail leads to a high-ranking political official of the state or national government, but concrete and extensive proof is needed before an accusation can be made. The whole situation can be very complex, and circumstantial evidence may point to innocent suspects.

19. Mute Macs

Situation: In one Primary base, all the MadMacs become mute—they're still on, but they won't communicate.

Objective: Find out why and how this happened, and reactivate the MadMacs.

Other notes: A high-ranking Xenoborg inhabited by a Master has come to a nearby Base-Teleborg. It has psychogenically located the CC base and used its abilities to paralyze the "minds" of the MadMacs. The psychogenic interference can be detected, but the alien base must be attacked to solve the problem. If the attack is successful enough, the base will be ordered to pull free and fly off, breaking the Master's contact with the MadMacs and releasing them. Note that this is the first use of psychogenics by the Xenoborgs.

20. King Jack & Queen

Situation: Jackson Wingate takes over the entire Richmond CCF Command base and imprisons all CCF personnel.

Objective: Penetrate the base and either convince Wingate of his errors or eliminate him.

Other notes: Refer to the Preamble in the CCF Manual for information about Wingate's creation. Jack has gone mad with power and has declared himself King of America, with Missy Dutrick as his loyal Queen. He controls every device and computer in the complex. The characters must first forcibly penetrate one of their own bases, which is possible only by using defense secrets obtained from another Command base. Then, to avoid the loss of computers and the data within them, all such devices must be disconnected one by one. The final confrontation is with Wingate & Dutrick, the latter being a fully functional CC but with a primitive Mad-Mac. Missy can be convinced of the error of her ways, and she may switch sides; but Wingate cannot be saved.

Pre-Invasion Games

The CYBORG COMMANDO™ game is not limited to the post-invasion setting. Many interesting games can be run in the immediate pre-invasion period, from 2030 to 2035. We recommend that your campaign start in the post-invasion setting. If you later choose to run some pre-invasion games for fun, use new characters to avoid paradoxical situations.

In the 2030s, the CCF campaign to promote public acceptance of the CC form was successful. The CCs acquired a reputation not dissimilar to that of superheroes in comic books—and they were all the more attractive since they were real and human. Furthermore, the poorest lad in the lowest slum could aspire to the position. Many recruiters concentrated their efforts on depressed and overpopulated urban areas, because the lad who survived and prospered in such an adverse environment was likely to survive anywhere. Those who qualified were widely publicized.

In short, the CCF was careful about its public image. For additional good will, CCs were often given missions that involved civic improvements and local law enforcement. International terrorism, though much rarer than it had been in the turbulent late 20th century, and civilian vigilantes (paramilitary forces) were other targets of CCF activity.

Of course, the CYBORG COMMANDO characters were rarely endangered by such missions. The challenge was rather to minimize the destruction of property and capture (never kill) their opponents, all while achieving their objectives and maintaining their public image.

In game terms, the characters' powers are balanced against those of the Xenoborgs; the two sides are very nearly equal in many areas, though of course the characters have a noticeable edge overall. When pitted against normal human criminals, or even against a small conventional army, the CCs should easily overcome their opposition.

No specific adventure suggestions for these games in the pre-invasion period are included in this set. However, many ideas can be obtained from other game systems, especially those involving spies and espionage, terrorism, and superheroes. In the latter case, however, considerable modifications are often needed, since the presence of many different superhero personalities is usually mixed into a rather fantastic view of the world. This game contains none of those; instead it concentrates on a realistic and scientific approach. Modify all adventures, whatever the source, to fit the concept and details of your own CYBORG COMMANDO game campaign.

Encounters

The following summarizes the various types of encounters that may occur in the course of a CYBORG COMMANDO™ game. As GM, select encounters for specific purposes and modify them as you see fit. These events may occur in urban or rural areas, and humans encountered usually live or work in nearby structures.

Beware of random encounters. When characters are striving to complete a given mission, minor events en route may be added for variety, but should not take much play time. Excessive numbers of irrelevant encounters will slow the game, detract from the mission, and generally exasperate everyone.

Aliens

Xenoborgs

Ambush: Up to one full squad (five Xenoborgs)

Assault, organized: Multiple squads

Bombardment or depopulation (city only): Flying Teleborg vessels only

Immature Xenoborg: Up to half normal size, nearly unintelligent

Scavenger(s): 1-3 Xenoborgs (squad members)

Alien (other)

Base: One Teleborg, any size

Powers: 2-20 sunning in a pool of water

Vessel: 1-3 flying Teleborgs land, many Xenoborgs disembark.

Terrans

Humans

Personnel: CCF staff members

Reinforcement: One CC (rarely more) arrives, sent by HQ to assist characters

Traitor: A normal human who is working for the Xenoborgs

VIP: A politician or officer (military or CCF)

Normals: Crazy

Normals: Conventional military (what few remain)

Normals: Paramilitary (civilian group with sophisticated armament and training)

Animals

Normal small, medium, or large: Only if native to the area (GM research required) or released from a local zoo; may be timid, defensive, neu-

tral, dangerous, or vicious

Controlled medium or large: A Xenoborg experiment. The animal is controlled by a computer implant, and acts as a scout (gathering information), a weapon (attacking on command), or both.

Miscellaneous

Disease: This is a common problem in the post-invasion setting, and could be any of a wide selection of horrors which have come about because of inadequate medical care. Possible diseases include many that were previously "eradicated" (actually only suppressed), which are now free to spread anew from remote areas. Disease can often be cured by simple drugs that are currently hard to obtain (e.g. antibiotics), but patients may require hospitalization in the advanced stages of illness.

Equipment malfunction: One system or individual item of one character malfunctions. It may be repaired either in the field or at a base.

Event, broad-scope: This includes any event of a magnitude that affects the overall campaign. For example, a disagreement of some sort between cities, states, nations, or even blocs might occur, or there might be an armistice settling such a disagreement. A major personage (CCF, military, political, or civilian) could die, or a technological advance could occur because of CCF research.

Intercepted signal: One or more characters picks up a signal sent to or from Xenoborgs nearby (within 5 miles), and the position of one or more aliens (anything from a roving squad to a hitherto undiscovered Base-Teleborg) can be deduced thereby. Translation is nearly impossible unless a well-equipped CCF Command base gives assistance, and even then only a few words can be revealed; but these may provide clues or even suggest a change of the characters' mission.

Mission change: A signal is sent from a Command or Primary base, or delivered by a messenger on the CCF staff. A signal may, however, also be fabricated by the enemy.

Natural disaster: This may be impending or in progress, or characters might encounter the aftermath of any such. Fires are relatively common in the post-invasion

setting.

Power source: Select one of the following:

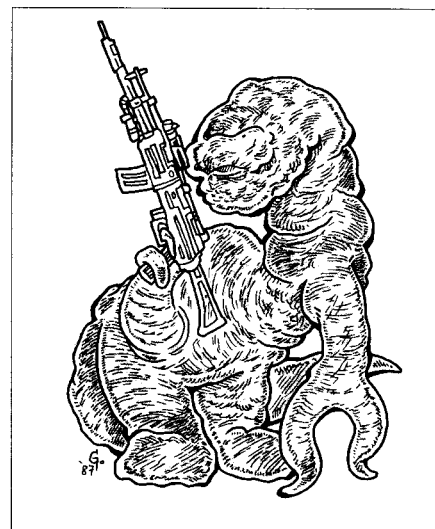
1. A significant source of power is found to be operational and/or in use. It may be a local electrical utility, but is more probably a central source. It is now functioning in either case, and some or all power lines between it and other areas are also functional.

2. Someone has created or rebuilt a device that uses running water or solar power (the latter common in rural areas) to produce electricity.

3. Emissions of oil or natural gas appear, produced as a result of shifts in the Earth's surface (due to bombings, earthquakes, and so forth).

Supply cache: A factory or storehouse of electronic equipment, chemicals, or some other supplies valuable to the CCF is found. A subsequent mission may be required to move the assets to a convenient location near a Primary base.

Weather change: Weather can set the overall mood of the game, and it is a major consideration during adventures. Rain and snow are falling heavily all over the world for months after the invasion because of the Antarctic blast; consider the effects of such weather on the terrain in the game area you select. Snow is probable in all of Canada and much of America, except for the southern states. It may become very deep, since snowplows are not likely to be operating with any regularity, so roads may be blocked. Additional casualties in isolated areas are probable.



CYBORG COMMANDO™

10-1001

SCIENCE FICTION ROLE-PLAYING GAME

by Gary Gygax, Frank Mentzer, & Kim Mohan

Set 1: The Battle for Earth

INVASION!

In the year 2035, Earth is attacked by aliens — hostile Xenoborgs who selected our planet as the next addition to their galactic empire. In mere days, man's conventional forces are destroyed, and the earth is overrun by alien troops.

Now, Earth's only hope lies with the CYBORG COMMANDO™ Force (CCF) — a cadre of super-soldiers who are part human and part machine. With their state-of-the-art defenses and built-in weaponry, the CCs may yet be a match for the invaders. But time is running short!

With this game, you can be a member of the CYBORG COMMANDO Force and drive off the aliens. This set includes everything you need to start the defense of Earth:

- ★ A 48-page CCF Manual for players — with character skills, combat rules, and a technical section complete with diagrams of CC construction,
- ★ A 64-page Campaign Book for the Game Master — including full details on the aliens and their invasion, the world political situation in the early 21st century, and an index of CC bases worldwide,
- ★ A 16-page adventure booklet packed with beginning scenarios, and
- ★ Two pre-inked dice.



Earth needs you! This is your last chance.



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