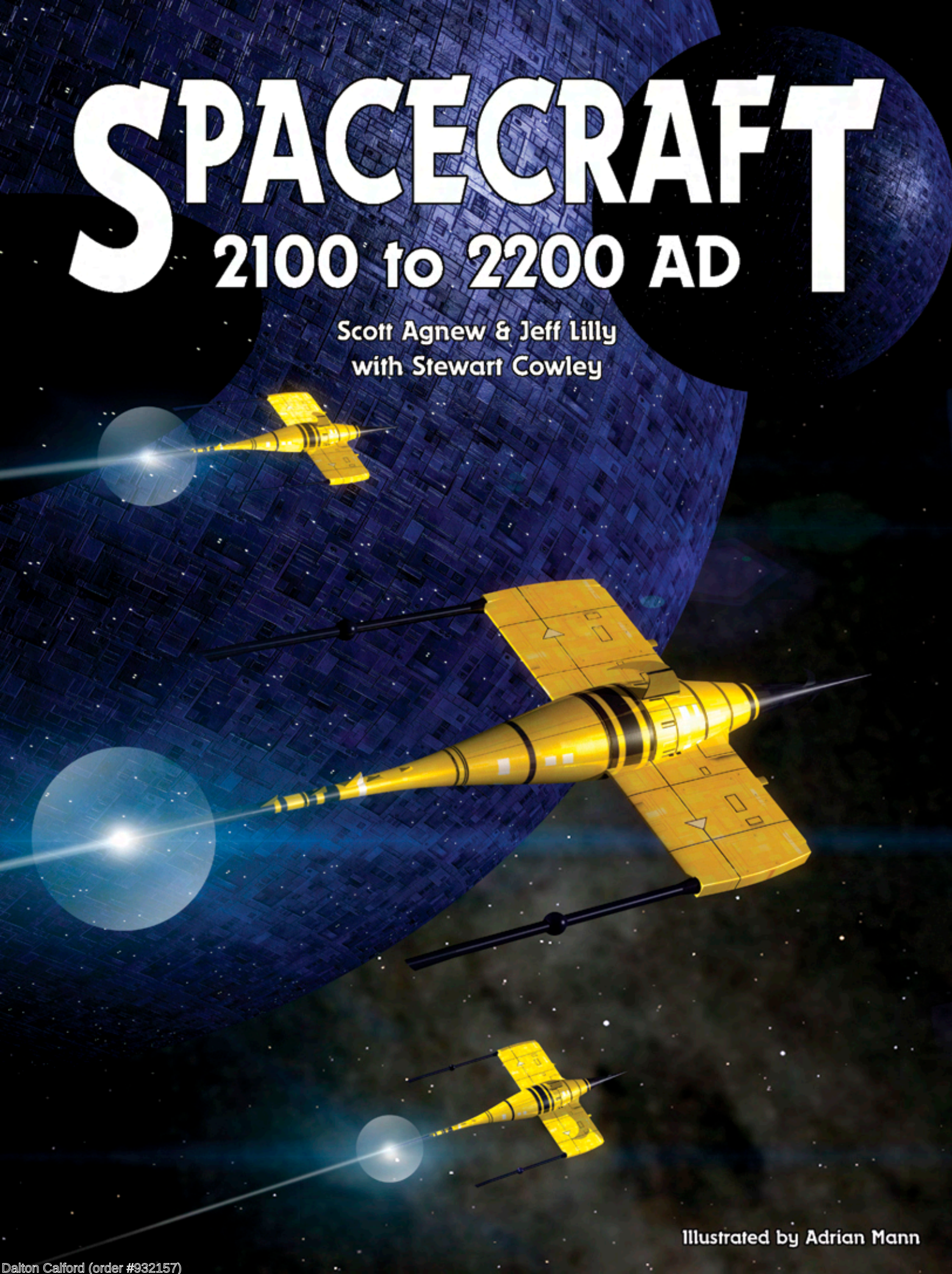
SPACECRAFT

2100 to 2200 AD

Scott Agnew & Jeff Lilly
with Stewart Cowley



Illustrated by Adrian Mann

TERRAN TRADE AUTHORITY HANDBOOK

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Spacecraft 2100 to 2200 AD

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Acknowledgement

This book is based largely upon the book *Spacecraft 2000 to 2100 AD*, originally published in 1978. That book used illustrations supplied by up-and-coming young sci-fi artists. Today these artists are well-respected veterans in their field. In keeping with the original concept of the book, *Spacecraft 2100 to 2200 AD* honors these artists by using a new, young sci-fi artist to recreate the look and feel of the original illustrations using 3D technologies unavailable in 1978.

Dedication

This book is dedicated to the author and artists of the original Spacecraft 2000 to 2100 AD book: Stewart Cowley, Angus McKie, Bob Layzell, Jim Burns, Colin Hay, Tony Roberts & Peter Goodfellow

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FOREWORD

I first received a copy of *Spacecraft 2000 to 2100 AD* as a Christmas gift in 1978. I was 10 years old at the time and I credit this book with instilling in me a lifelong love of science fiction. Friends and I poured over the pages in that book as our imaginations put us in the cockpits of Hornets and Partisans, battling the enemy Proximans in man's first interstellar war.

It wasn't until many years later, after the dawning of the internet and the exchange of knowledge that it allowed, that I realized I was not alone. The TTA books had, in fact, inspired an entire generation of Sci-fi fans and sold over 800,000 copies worldwide. With this revelation I decided it was long overdue to bring this incredible book to a new generation with this updated and revised edition. To that end I recruited fellow TTA fans Jeff Lilly and Adrian Mann to assist in this project and would like to thank them immensely for their hard work and creativity. It is my sincerest hope that this edition will bring back fond memories for old timers like myself and also serve to inspire a love of Sci-fi in an entirely new generation. A special thanks also to Mr. Stewart Cowley who wrote the original TTA books. Thank you for the years of imagination and fun.

- K. Scott Agnew

What is it about the TTA that makes it so fascinating? I think it's the feeling that humanity has only scratched the surface of the mysteries "out there", and so far has found more questions than answers. Like exploring our own world in the age of sail, we do so with courage and hope, but we are not the masters of the new element. There are many perils to face; spacewrecks, uncharted territory… and here, indeed, there be monsters (or at least aliens, some friendly and some not…). Space takes its toll, but onward we sail… into warfare, into fabulous new worlds, into mysteries barely imagined and even less understood. Plucky and resolute, we acknowledge the peril, but we do not shy away from it.

I owe my lifelong fascination with SF to the Terran Trade Authority and its greatest commander, Stewart Cowley. It was he with the vision, audacity, and sparkling creativity to do what he did; take a bunch of unrelated space art and weave it into a future history that is not only compelling and entertaining, but has a wonderful sheen of authenticity; the weight and heft of true events. He stood on the deck of his ship of dreams and showed us the way. Having the opportunity to write in his universe and expand the canon has been a true honor.

- Jeff Lilly

Reaching for the Stars

From the ancient astronomers and astrologers of Egypt and Greece to the early science of Galileo through to Einstein and Hawking in the 20th century, humanity has always looked to the stars. Even today, modern stellar explorers like Gibson, Madden and Tsang continue to delve into the cosmos. These names along with that of Henri DeVass are household names, testament to humanity's fascination with the stars and what lays beyond known space.

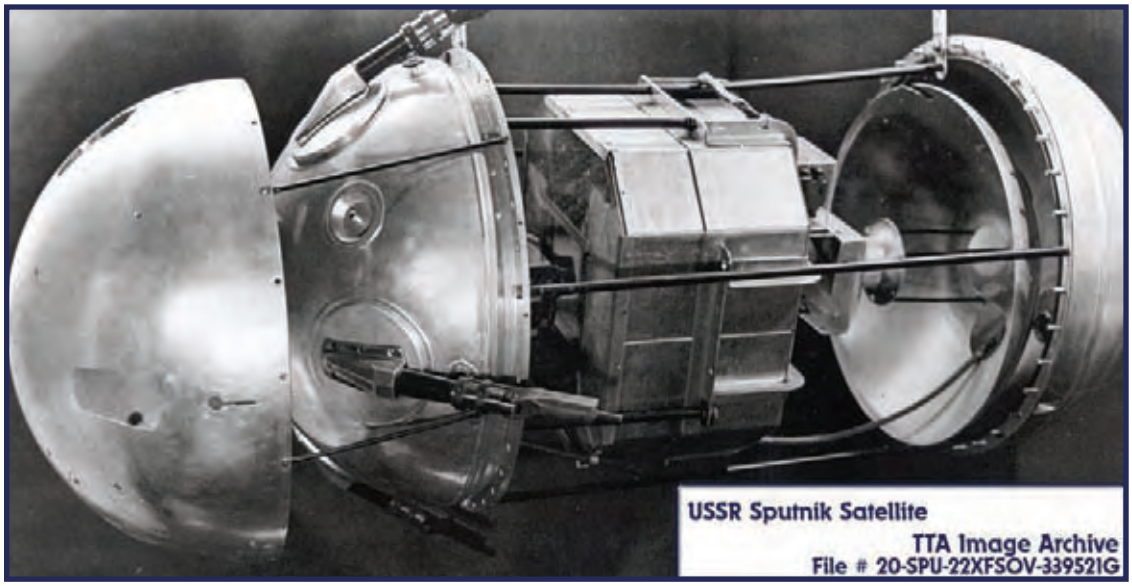
The twenty-second century will be remembered as one of the most significant periods of human history. Those qualities of direction, purpose and unity which are the essential ingredients for real progress had gradually been dissipated in a fragmented world. Humanity had become preoccupied with the minutiae of daily living and men of broader vision were finding themselves an unheeded minority. Man needed a quest to fire his imagination and extend his abilities. For a while he found one in his early attempts to explore the vastness of space, but the exhilaration was soon replaced by a growing resentment of the massive costs and minimal returns. Instead of being a springboard to escape a shrinking world, space became another weapon in mankind's civil war.

Paradoxically, the strain of meeting the demands imposed by space programs and the difficulties of sustaining enthusiasm led to a renewal of effort, for it was soon realized that real progress could only be made by a sharing of objectives and the means by which they could be achieved.

True Spaceflight began midway through the 20th century. On October 4th, 1957, the USSR (a federation of states then under communist rule and dominated by Russia) launched the first object to be put into orbit around the Earth. The 83 kg Sputnik satellite sparked a "space race" with the USSR's greatest rival of the day, the United States of America.

This period of fierce competition between the USA and USSR saw great leaps in technology and science and ran from the Sputnik launch in 1957 until roughly 1975. Important to both nations for both military and propaganda reasons, the governments of the day invested huge sums of money in their space programs attempting to one-up their rival.

On April 12, 1961, the Russians once again beat their American rivals, this time being the first to send a human being to reach orbit. Twenty-three days later the Americans followed suit, sending astronaut Alan Shepherd into space aboard the Freedom 7 missions. Astronaut John Glenn became the first American



to orbit the Earth on February 20, 1962 aboard Friendship 7.

Embarrassed by being second in almost all space attempts, the Americans finally trumped the USSR by being the first nation to place a man upon Earth's moon. After the many Soviet successes, especially Gagarin's first manned flight, the American President committed massive funds to become the first country to land a man on the moon and safely return him to the Earth.

"That's one small step for (a) man, one giant leap for mankind."

- US Astronaut Neil Armstrong

On July 20th, 1969, the Americans finally got their "first". American astronaut Neil Armstrong became the first human in history to set foot on the moon, or any planetary body other than the Earth for that matter.

The space race also saw other "firsts" although these were less publicized than Sputnik and the moon walk.

In July 1975 the "space race" came to an end as the American and Soviet governments began to work in a limited cooperation toward spaceflight and space exploration. The joint Apollo-Soyuz mission was the first international manned spaceflight. It was designed to test the compatibility of rendezvous and docking systems for American and Soviet spacecraft and to open the way for international space rescue as well as future joint manned flights.

The pace of an international cooperative effort to space exploration began to accelerate in the final decade of the 20th century as the old Soviet Empire crumbled with the fall of communism. The new Russian federation found itself near bankruptcy but still continued with space research although now as a junior partner to the US and the newly formed European Union. During these waning years of the 20th and early years of the 21st centuries new technologies open new doors.

This era saw the construction on the first orbital space stations as well as the first commercial space flights although these were only flights into near orbit at this time.

While the twenty-second century will undoubtedly be remembered as one of the most significant periods of human history, those qualities of direction, purpose and unity, which are the essential ingredients for real progress, had gradually dissipated in the fragmented world of the 20th and early 21st centuries. Humanity had become preoccupied with the minutiae of daily living and men of broader vision were finding themselves an unheeded minority. Man needed a quest to fire his imagination and extend his abilities. While humanity's early attempts to explore the vastness of space was a good start, the exhilaration was soon replaced by a growing resentment of the massive costs and minimal returns. Instead of being a springboard to escape a shrinking world, space became another weapon in mankind's civil war.

Paradoxically, the strain of meeting the demands imposed by space programs and the difficulties of sustaining enthusiasm led to a renewal of effort, for it was soon realized that real progress could only be made by a sharing of objectives and the means by which they could be achieved. This task would have proven impossible were it not for the political will of mid-21st century nations to come together in a spirit or cooperation for the betterment of all mankind.

The many conflicts and wars of the early 21st century gave birth to this new radical school of thought and thus it was, that mankind finally began the long voyage into space.

The early 21st century was a turbulent time for humanity. A terrorist attack on two of the world's tallest buildings in New York City sparked off a prolonged period of conflict between the United States of America and much of the less-developed nations of Earth.

On September 11th, 2001, an extremist Islamic terrorist group known as Al-Qaeda destroyed the World Trade Center in New York City by flying two hijacked passenger planes into the buildings. The resulting fires caused the building to collapse with thousands of deaths and even more injuries. This incident began the long period of minor conflicts between the United States and several smaller nations—initially Afghanistan, Iraq and Syria—that the US accused of sponsoring or harboring terrorists.

With the collapse of the old Soviet Union a decade earlier, the United States of America had emerged as the world's only true Super Power. By 2010, the supposed "War on Terror" had become but an excuse for an increasingly imperialistic US government to impose its will on other nations.

This led directly to the Sino-American War of 2013. Begun when Taiwan finally declared independence, this war could be considered World War Three were it not for the fact that many American allies opted to abandon the superpower in its push for global dominance.

Having been through two World Wars in the 20th century, and because of the growing strain on diplomatic relations with the United States, the European Union opted to stay out of the war. North Korea did join the conflict on the side of their ally, China. Australia, the Philippines, Indonesia, and South Korea all declared war on China with the Americans. To make matters worse, both Cuba and Venezuela publicly voiced their support for the Chinese although they stopped short of joining the Chinese alliance. Venezuela did however cut all trade relations with the United States. This was critical to the US as it received up to 1/5 of its oil supply from the South American country.

The Sino-American War was long and brutal. In the end, China was forced to withdraw from Taiwan and sue for peace. The American government of the day was controlled pri-

marily by the by a hawkish group of pro-war individuals and corporations who encouraged the government to push for unrealistic concessions. The cease fire negotiations dragged on for 9 months during which time the US and allied militaries pushed further and further into Chinese territory. By the end of 2016, it was obvious that the US administration would accept nothing less than unconditional surrender, something the rest of the world knew the Chinese could never accept.

The American public, by this point, had had enough of war and pro-war politicians and within weeks, President Schering was impeached over an otherwise innocuous corruption scandal. Congress forced his Vice President into a peace treaty with China, finally officially ending the War on June 6th, 2017. The military-indutsrial elements in the US government lost all hope when they were resoundingly defeated in the next election and from that point forward, the US strove to restore its image as the protector of freedom in the world and largely abandoned its neo-imperial aspirations.

One positive thing to come out of the Sino-American War seems to be the fact that the nations of the world put an increased value on co-operation following the War. Never wanting to see another Super Power able to force its will on the rest of the world, the United Nations took on major reforms and sought to truly be a force for freedom and equality in the world.

By 2050, the United States and China were on friendly terms again and were actively working together on many fronts including scientific research and space missions. The European Union too, had a flourishing space program by this time, in many ways more advanced than that of the Americans.

In 2053, led by South African President James M'Tombe, the nations of Africa (with the exception of Egypt, Somalia and Kenya united to form the Pan African Union (Kenya would join 2 years later). This was followed later by all South American countries uniting under the MercoSur Confederacy.

By the end of the twenty-first century these major national blocs were co-operating in an expanding range of projects, thereby avoiding the wasteful process of duplication and parallel research that had been previously inevitable.

The United Nations also started to change about this time as the myriad of National ambassadors slowly shrank in number as the major regional blocs began replacing their constituent national ambassadors at the UN with a single ambassador representing each bloc. This greatly accelerated diplomatic dealings amongst these nations and many joint ventures were fast tracked as a result.

In 2090 the World Community Research Council was formed to manage and co-ordinate these activities, and to allocate funds contributed by its member nations. The WCRC became the largest research establishment on Earth, operating a number of major stations such as the North African Space Research Centre.

Within a short time the investment made in space technology began to reap dividends. During the early years of the last century extensive facilities on our moon were established and industrial bases began to show a return. Most significant were the host of new materi-

als and techniques which provided a basis for a rapid acceleration in the growth of industrial technology. For example, vacuum mills in free-fall were able to produce large quantities of valuable new alloys and uni-directional stress components, many of which were responsible for major advances in the development of new spacecraft. These, together with the earlier successes in the field of nuclear engineering, led in turn to the building of further facilities on Mars.

Another important point had been reached because the creation of the bases required men to work on their construction and maintenance. In turn these men required support for the long periods of time they would be away from Earth, so their families accompanied them. It was then but a short step to the provision of regular access to and from the home planet, and though expensive, space travel had become an everyday reality.

...the deVass Generator opened the road to the stars and led to our first contact with an alien intelligence.

By today's standards, these early craft appear amusingly primitive and even dangerous, consisting of little more than a hollow tube with engines at the back and elementary controls at the front. It is almost inconceivable that people could have subjected themselves willingly to the discomfort and risks that space travel presented at that time. It is impossible to catalogue here all the thousands of individual developments and discoveries which led to our present skills in astro-engineering, but a few examples stand out as revolutionary.

Although the principles of nuclear drive systems had been put into practice as far back as the late 2080s, the work done by the McKinley Corporation, who now produce the Ion UltraDrive engine, transformed them into highly efficient and economical power sources, and many of today's ships are equipped with engines that are virtually identical to those introduced in 2087. More important still was the invention of the Warp Generator by Henri deVass fourteen years later. This device creates a distortion of distance and time in a way which folds up space. Point A meets point B and an object at either point can transfer to the other. When the generator is shut down, space unfolds and the object has arrived. Journeys that would otherwise take years can be made in a matter of weeks. Although, in theory the transition can be made almost instantaneously there are a number of complications which prevent this. Time is required to build up sufficient power to satisfy the enormous energy requirements of the generators prior to a jump and also to replenish reserves afterwards. In addition, ships have to move under conventional power to and from specified warp zones to avoid the possibility of either drawing other objects into the jump or of collision when emerging.

Despite these limitations the deVass Generator opened the road to the stars and led to our first contact with an alien intelligence.

In 2136, a manned survey ship made contact with the inhabitants of Alpha Centauri I, 4.3 light years away, and this meeting led to a happy and rewarding association. In 2145 the Trade and Technology Exchange Agreement was signed with the government of Alpha Centauri (Alpha has been a unified world for hundreds of years before human contact), and one of the most important benefits we gained was the acquisition of anti-gravity technologies. These were successfully brought together

in 2145 by Dr Hans Berger in his Gravity-Resist Projector, and the form of spacecraft was transformed overnight. Now ships of very large proportions could safely be landed under most gravitational conditions, the Colonial III being a good example of this application.

Contact with the Alphans accelerated the movement toward a single world government as the Alphans were less than enthusiastic about signing dozens of individual trade agreements with the still fragmented governments of our world. Making it clear Alpha would deal only with a single entity, the United Nations appointed the World Trade Authority (which was the successor organization to the World Bank and World Trade Organization of the late 20th and early 21st centuries) as the sole representative of all Earth governments in matters of trade and technology exchange. This organizations was later renamed the Terran Trade Authority in 2142 and the TTA has since grown into one of the most important and influential organizations on Terra.

The next major influence on spacecraft design was due to more unfortunate circumstances. In 2147 one of our survey ships was approaching Proxima Centauri, an inhabited system with which Alpha had a long history of conflict and antagonism, when it was attacked and destroyed. Soon afterwards Alpha was subjected to the worst thermonuclear attack it had ever experienced, this being followed by the destruction of one of our spaceliners with a full complement of passengers. The Proxima War had begun. It was to last for twenty years, during which time a wide range of military ships was produced by all three star systems.

The state of war always accelerates technological development and the hideous cost in lives and resources was at least to some small degree offset by the considerable advances made in the field of space travel. Navigational systems, hull design and materials, power units and communications all reached new levels of sophistication as a result of the long period of heavy investment and intensive research.

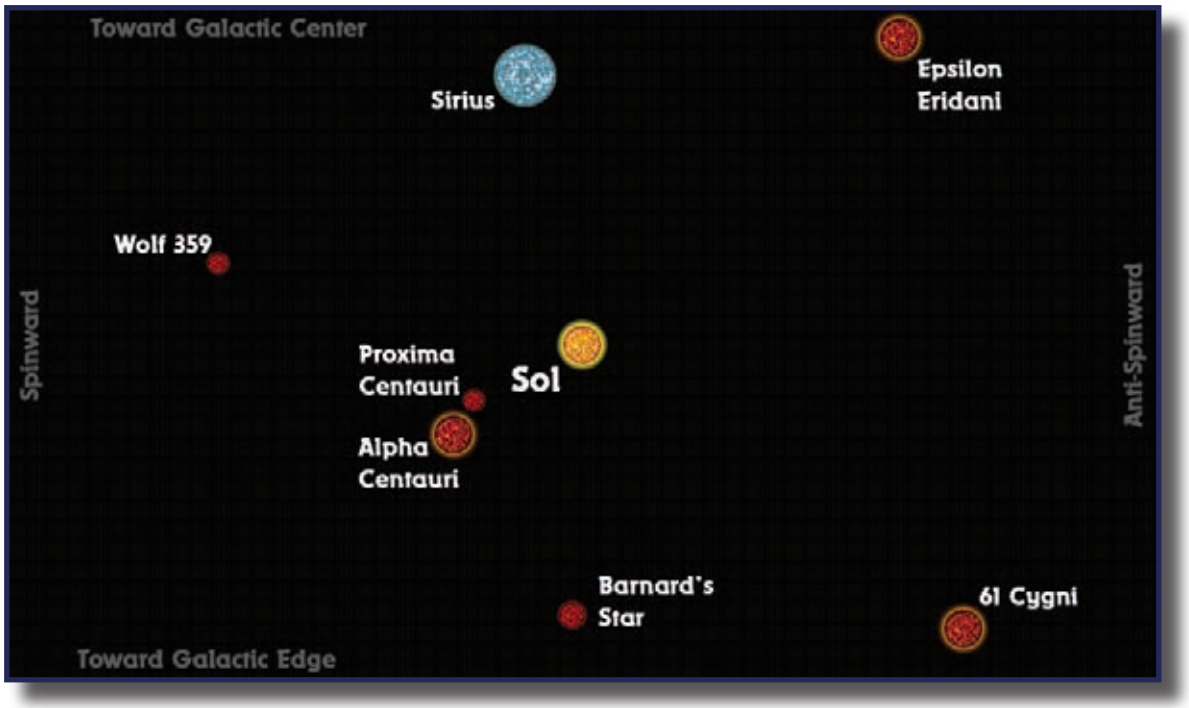
Ships designed during this era feature strongly in this book. Until the war, space travel was still a fairly limited activity and this was reflected in the comparatively small number of different types of spacecraft. The Proxima War bred dozens of new craft, many of which were adapted for peaceful roles afterwards due to the exigencies of the reconstruction. As a result there is now a wide variety of ships to be seen in the spacelanes and although mainly commercial or military in function, more and more purpose-built personal transport vessels are making their appearance. In contrast to these diminutive new members of the spacecraft family are the gigantic settler ships poised to take humanity further still, to new worlds light years away.

The accomplishments of the twenty-second century are only the beginning of man's adventure in space, but for many people, this era with its setbacks, successes and optimistic gambles will always be the golden age of spaceflight.

TIMELINE OF THE FUTURE

2062	World Trade Authority formed to co-ordinate international commerce
2087	Introduction of nuclear powered engines; Commercialization of space becomes increasingly common.
2090	Foundation of the World Community Research Council.
2098	WCRC North African Space Research Centers now operational.
2104	The first space freighter, Colonial I, enters service
2105	Work begins on the first Lunar Station.
2111	Lunar Station Omega fully operational.
2121	Work begins on Mars Station.
2114	Introduction of the McKinley Ion UltraDrive in Colonial II spacecraft.
2115	Martian Queen makes first commercial passenger flight to Mars.
2118	First shipment of new alloys from Lunar industry reach Earth.
2127	Warp Generator constructed by French scientist Henri DeVass.
2135	WCRC and UN authorize the first use of the DeVass Warp Generator. Manned survey ship enters Sirius star system and returns.
2136	European Union manned survey ship makes contact with inhabitants of Alpha Centauri I.
2137	Alphan language barrier is broken.
2139	World Trade Authority becomes Terran Trade Authority. Trade & Technology Exchange Agreement signed with Alpha Centauri.
2141	First orbital industrial center in Jupiter orbit completed. Dozens of unmanned survey ships sent to star systems up to 12 lights years from Terra.
2142	First energy absorbent defense shield (EADS) produced by TTA. TTA Mining operations begin in Epsilon Eridani system.
2145	Working from existing Alphan technologies, Dr. Hans Berger introduces the Gravity Resist Generator. First colony ship launched from Beijing, China.
2146	Mars Orbital shipyards completed. Mining operation begin in the Barnard's Star system. Several small colony ships launch for Earth and Mars shipyards.
2147	Pathfinder IX survey ship destroyed by Proxima Centauri. Alpha Centauri I suffers unprovoked thermonuclear attack. Alpha Centauri and Proxima Centauri in a state of war.
2148	TTA Interstellar Queen space liner destroyed en route to Alpha Centauri III. United Nations declares war against Proxima Centauri. US, EU and Pan-African military spacecraft leave Earth for Alpha Centauri.
2149	Terran Defense Authority formed by United Nations.

2150	TDA and Alphan fleets shattered in Battle for Alpha III. Proximan forces capture Alpha military base and shipyard at Alpha III.
2151	Battle of Alpha Centauri IV. Proximan fleet forced to retreat to Alpha III.
2152	Proxima develops Warp capability Battle for Mars.
2153	Second Battle of Alpha III. Proxima abandons Alpha III. TDA expeditionary fleet destroyed in Proxima system.
2155	Battle of Alpha I - Proximan Fleet all but annihilated.
2156	Third Battle of Alpha III. Two Proximan fleets converge to destroy Alphan bases at Alpha III.
2160	TDA commandos destroy Proximan industrial facility at Proxima IV.
2161	Proximan forces capture Alphan mining colony at Barnard's Star. Proximan's destroy the colony as Alpha is poised to retake it.
2165	Invasion of Proxima Centauri system.
2166	Bases and complexes at Proxima IV captured or destroyed by Alphan fleet.
2167	Battle of Proxima Prime
2168	Treaty of Al-Gol signed. War ends.
2173	First jet-tube opened on Earth between Europe and North America. Massive reconstruction effort underway on Proxima Centauri I. Terran Federation formed (seats in Congress for all Earth nations along with 4 seats for Luna and 8 for Mars).



Prelude to War

Among the three known sentient, space-faring races, it was the Alphans who were the first to develop warp technology almost 200 years ago. Discovered accidentally as a side effect of temporal experiments, the warp effect was initially dismissed as a curiosity, but further experiments showed that a stable field could be generated over very large areas, large enough to encompass a ship. The Alphans had begun exploring the environs of their star, Alpha A, soon after achieving spaceflight, as well as the planets of its binary partner, Alpha B, even establishing a colony world on the sister star's second planet.

They had plenty of space on their two worlds, and were not anxious to colonize new ones, but their planets were resource-poor and the warp system was seen as a possible way to greatly expand the search for raw materials. As the system was being perfected and tested, a survey ship, powered by conventional drives, was dispatched to Proxima to canvass the system for mineral wealth. This was the longest journey ever undertaken by an Alphan crew, and as a result a small Ring was chosen for the task and trained for the mission, rather than relying on chosen specialists who would have found the separation from their Rings for such a long time to be too much to bear. This decision, while necessary, ultimately contributed to the tragic events to follow.

The survey crew arrived at Proxima after a

journey of several months and was astonished to find that the second planet, far from being a lifeless ball of rock, possessed a breathable atmosphere, oceans… and life. Scans revealed what were clearly settlements on the surface. The Proximans, at the time, were not as scientifically advanced as the Alphans. Having passed through their industrial revolution phase a century and a half before, they had slowly developed atmospheric craft and low-orbit space capability. The Proximan homeworld was not united at the time, instead being split into a number of nations bound by a tight web of intrigues and alliances.

The Alphan crew had not been trained for a first contact situation, instead being merely briefed on the technical aspects of prospecting and surveying. As Alpha had not yet developed hyperwave transmitters, any messages sent back home would take two months to arrive, even traveling at the speed of light. The Ring conferred and decided that, given the importance of the discovery, they should attempt to find out all that they could. In retrospect, it can certainly be said that curiosity, the desire to be credited with first contact, and their lack of training got the better of them. After sending a message home, they headed for the surface.

The Alphans had chosen a coastal city as their landing point, which unfortunately was the capital of the most powerful of these nations, called Tanaaikol, run by a reactionary and militarily hawkish government. Thinking that one of their enemies had somehow acquired a secret weapon, they scrambled atmospheric fighters and intercepted the descending Alphan ship. The Alphans were alarmed at the response and could not understand the instructions they were receiving. When the Alphans attempted to break off and return to orbit, they were fired upon by the Proximan aircraft. The Alphan ship, stricken, crashed into a lonely stretch of countryside, killing its crew.

The crash site was quickly surrounded. The Tanaaikol government sent an investigative team and quickly grasped the situation. The Alphan ship, though not flyable, was still largely intact, as were the bodies of the crew. The wreckage and bodies were removed to government laboratories and the Tanaaikol leaders kept the incident secret.

There were several reasons for this, the first of which was religious. The dominant Proximan religion held that their people were the most perfect form of life in the universe, and perhaps the only one with sentience. Many Proximans firmly believed, in fact, that a deity had created them directly. In addition, their religious tradition held that good things sprang forth from the ground, while the sky was the domain of the devil. The introduction of powered flight and orbital satellites had touched off many nerves in the more superstitious members of the population, who feared divine retribution. To have the population know that aliens (or demons?) were among them would, the government feared, set off a panic and cause them to doubt authority.

The second was political. Tanaaikol saw the Alphans' obviously advanced technology as a key to furthering their own power on the planet. If other nations learned of the ship, they would demand access to it, or perhaps even launch a preemptive strike to keep Tanaaikol from utilizing its secrets.

The third was scientific. What new and important knowledge could be gleaned from the ship? Though the Alphans were physically dissimilar, they were enough alike that there might be some kind of link. The Proximans were already deeply into genetic experimentation, and the seizure of alien DNA was an unexpected gift. Finally, there were the underlying questions, weighing heaviest of all: Where had they come from? Were there other races out there like them?

The Alphan ship was unarmed. This, plus the lack of any obvious military equipment, led the Tanaaikol government to conclude that the ship was never a threat. There followed a bit of hand-wringing at the moral implications of firing on an unarmed ship, but that was quickly overtaken by greed at the bounty of knowledge that was to be gained. Over the next several years, the best scientists available to Tanaaikol dissected the ship and its crew, studying every minute detail, and applying what they had learned… meanwhile, the government was making plans for what to do when the visitors showed up again…

Meanwhile, back on Alpha, the ill-fated survey team's message had arrived. The Alphans were stunned at the news of a first contact situation. The mystery deepened as no further transmissions were received from the mission. Whether they had suffered a malfunction, crashed, or met their demise at the hands of the natives was not discernible. The Alphan government urged a cautious response, but Rings friendly with the Ring that had crewed the survey ship demanded action. There was another survey ship in the field, equipped with powerful detection equipment, engaged in a mapping operation in a position about halfway to Proxima. It was sent immediately to monitor the system. This second ship stayed to the limits of its supplies, monitoring transmissions on Proxima, before returning. No signal was received from the first ship, and no trace of the crew was found However, the data gathered allowed Alphan scientists to gain a basic understanding of the Proximans, as well as to crack the language barrier.

Following up on the situation further in a timely manner was not in the cards, however. If the aliens were hostile, sending another survey craft would be dangerous. The new expedition had to be better-equipped. Outfitting a team was not the problem… sifting through theory and designing a curriculum to train them was. In addition, perfecting the warp system was proving troublesome. Alpha could always send conventionally-equipped ships, but with the possibility of hostilities, having a quick means to disengage and report back was deemed essential. All of these factors, compounded by political bickering over the details of the mission and the sheer cost of mounting another expedition in an era when spaceflight was still fairly new, further slowed the process. The second expedition would not return to Proxima for over forty years.

The second expedition was indeed well-equipped for its day. A large carrier ship, equipped with the de-bugged warp generator, was outfitted with three dual-environment landing craft equipped with weaponry and sophisticated detection gear. The last transmission from the doomed survey ship had indicated that the aliens had apparently only achieved low orbital spaceflight capability, and the ships the Alphans sent would surely be enough to deal with that level of technology.

The short jump was completed without incident and after a few days of braking maneuvers, the carrier reached its target. Initial scans of the planet confirmed what the first teams had found. Then, one of the detection crew frantically shouted to the command ring. Something was coming over the planetary horizon…

The Alphan crew stared in shock as they found themselves confronted with a squadron of twenty ships, their design obviously based upon the lost research vessel, but brandishing various primitive but effective-looking weapons systems as well. The Alphans' shock increased as sensors indicated that a fleet of similar size was coming up on them from astern.

The Proximans had been busy in the intervening decades. Tanaaikol had parlayed the technology gained from the survey vessel into political and technological dominance of

Proxima. They had also secretly worked on a military space presence, designed for the day the aliens came back…

The Alphans, however, were ready. The Proximans were astounded to find themselves being addressed in their own language. After several hours of tense negotiation, the Alphans agreed to send a team of four to the surface in one of the landing craft. Having made planetfall, the Alphans found themselves hustled away to meet with a series of Proximan leaders, with whom they conferred for several days.

The first questions asked, of course, sought to determine what had happened to the first ship. The Proximans claimed that it had crashed, offered their condolences, and explained that it had been very helpful in creating their own first fleet. Requests to see the craft were rebuffed, however, and the Alphans soon suspected that they were not being told the whole truth.

Meanwhile, a wild card was in play. Within the Proximan delegation was a carefully planted spy for Omnooře, Tanaaikol's main rival nation. She gave a full report to her government about the situation, and Omnooře decided that this was their best opportunity to weaken the iron grip that Tanaaikol held on their world. While realizing that their actions may cause a panic, they also saw an opportunity to carve a new niche in the resulting chaos.

Omnooře contacted the Alphan carrier ship, still in orbit, and advised them that Tanaaikol was manipulating them for their own

political gains. The Tanaaikol ships immediately picked up the signal and alerted their leaders. The Tanaaikol leaders realized that their carefully-guarded secret was secret no more. The two governments exchanged tense calls. The Omnooře demands were simple: either announce the presence of the aliens yourself, allow us to do it, or suffer the effects of an immediate pre-emptive thermonuclear strike...

Tanaaikol's leaders, after a few tense minutes of study, realized that they had to take the initiative to maintain any semblance of control. They agreed to reveal the Alphans to the world, and they did.

What happened next was the beginning of the tragedy that would culminate a over century later in the nuclear destruction of Alphan cities, a twenty-year war and finally the razing of the Proximan homeworld. While the Proximans technically "started" the war, it was the Alphan reaction to their Proximan brethren and their planet that many historians point to as the true seed of the conflict.

The Alphans were now taken around openly, and saw much of the Proximan culture firsthand. In doing so, they found themselves confronted with ideological opposites, socially and religiously benighted, with bodies that seemed to be stunted parodies of their own. When they discovered that the Proximans were dominated by one sex which held sway over the other, and that their society was arranged in strata by subjective worth, some of the members allowed these differences to offend their egalitarian ideals. In addition, the higher gravity wearied them, the low light levels depressed them, the strange foods they were offered sickened them, not to mention that they found the Proximans to be unbearably ugly. They were also frustrated by their fruitless requests to see the remains of the first ship or the bodies of the crew.

When the Proximans did not respond to what the Alphans had decreed to be rational modes of thought, they began to treat their hosts in a patronizing manner. Perhaps most disastrously, the members of the Alphan team found themselves shocked by the grip that "primitive" religious mystery (the Iŵegeq religion) seemed to have over the people, and began to lecture them. Their intentions were good, at the heart of things. The team really did want to help. But not being holders of Proximan values, they could not understand how deeply rooted those values were, nor could they fathom the level of pain and sacrifice the Proximans would be willing to undergo to defend them.

The unrest that the Omnooře government had hoped for did indeed materialize, fanned by the Alphans' own miscalculated attempts at education. Riots broke out not only in Tanaaikol, but in other nations that also had Iŵegeq followers. Iŵegeq leaders called for the expulsion of the aliens. Some of the more radical elements even put prices on their heads. Over the next few days, the ranks of protestors grew, the calls grew more strident, and the response more hysterical, until the Alphan contact team had to be taken into protective custody.

What the Omnooře government had not counted on was the fact that the unrest might not serve to cripple Tanaaikol, but to unite Proxima. Tanaaikol, in a surprise move, revealed the existence of their space fleet, and said that they had been building it for years in a heroic attempt to prepare for the coming war against the threat from the skies. The other Proximan nations, inflamed by propagandistic loops of the most insulting Alphan comments being continually broadcast, pressed by the hysterical voices of the Iŵegeq believers, rushed to join in alliance with Tanaaikol.

The Alphan ship, monitoring all of this, sent a demand to return their crew. The Proximan fleet, in response, closed ranks around the

Alphan ship and demanded that they surrender. While the Alphan ships were certainly more advanced, the sheer weight of Proximan numbers would be telling in the end. Leaving the crew on the ground would be heartbreaking, but it was more important to prevent any more ships falling into Proximan hands, and, above all, to protect the secrets of the warp generator.

The battle that ensued, recorded by the Proximan fleet and orbital stations, was later broadcast by Tanaaikol to the entire planet. The Alphan carrier pretended to acquiesce, beginning to drop into the upper atmosphere of Proxima. Abruptly, it nosed upward, blasting out of the atmosphere at full power. The shockwave took out one of the Proximan ships, which by a stroke of terrible luck fell on the outskirts of a small coastal village, killing most of the two thousand residents. This incident would be used as a further rallying point in years to come.

Meanwhile, the Alphan carrier was accelerating as fast as possible to jump distance. While it could certainly outrun the Proximan ships, it could not outrun their missiles or lasers, which were already starting to impact on the ship's stern. Two Alphan volunteers, in a selfless act of sacrifice, each took one of the remaining armed landing ships and roared off to engage the Proximan fleet. They managed to destroy ten Proximan ships before being destroyed themselves, and in the resulting confusion the mothership was able to disengage and head back to Alpha.

What happened to the team on the ground is still somewhat speculative, as the sources come from declassified and / or seized Proximan government documents revealed after the end of the war. It seems that attempts were made to interrogate them. Two of the team, in an unguarded moment, committed suicide, and the remaining two were being moved to separate locations. The Omnooře spy was on one of the moving teams and apparently killed the other guards. The spy then gave the Alphan her original clothes and tools and took her to the hangar where the last landing ship was located. Spotted by guards, the Alphan apparently remotely fired the ship's weapons systems, destroying the hangar and the ship and killing herself in the process. What happened to the fourth Alphan is still unknown.

The second survey ship returned to Alpha and informed their stunned and horrified world of what had happened. Alpha had neighbors… hostile neighbors. Emergency government sessions debated different courses of action. A policy of containment and of gradually building up Alpha's own forces was decided upon. Certain Terran experts often point to this decision as Alpha's biggest and most puzzling mistake, a sure indication that the Proximan threat was not correctly assessed and that the Alphans refused to take their adversaries seriously. Alphans, never overtly militaristic, nonetheless had more advanced ships than the Proximans. An immediate all-out strike, they say, could certainly have wiped out Proxima's fledgling space fleet, and perhaps averted the coming war. Defenders of the policy point out that Alpha did not have the resources or will at the time for the prolonged ground war that would have been needed to topple the governmental structure. A preemptive strike would only have inflamed the Proximans' religious passions further, and even if the fleet had been totally destroyed, without removing the government, the fleet would simply be rebuilt. Plus, the Proximans had shown what they could do when given a single survey ship to work with. Any Alphan military ships destroyed in battle and subsequently salvaged would just give the Proximans more materials and technical knowledge to work with.

On Proxima, Tanaaikol was consolidating its power. Taking full advantage of the religious fervor, the Alphans were depicted as the

demons who had come from hell (the skies) to wreak havoc on the life-giving ground. Members of the Proximan space force were painted as the ultimate heroes, brave warriors who willingly ventured into hell to slay the demons on their own ground. Recruitment skyrocketed. A worldwide task force was established to coordinate resource allocation for building up the space fleet. Research and development continued at a feverish pace. The Proximans obviously expected some sort of retaliation. When it didn't materialize after a couple of years, the government began to grow anxious. The populace began to question whether the threat from the skies was real or just a power play by Tanaaikol. Dissent began to grow.

Ironically, it was the Alphans who once again unknowingly fanned the flames. Enforcing their government's policy of containment, Alphan patrols had noted that Proximan ships were venturing further and further from their homeworld. A line was drawn, and when a Proximan ship crossed it, it was captured by the Alphans and the crew questioned. Unfortunately, the command ring of this particular Alphan ship was overzealous, a little too eager to prove their superiority and take revenge for some of the past incidents. They utilized powerful drugs on the Proximans, who subsequently were released to pilot their ship home. They arrived; brainwashed, hollow shells of their former selves, spouting praises to the Alphans and their superior society.

All seemed quiet for many years after. Then the raids began. In a move that caught the Alphans completely by surprise, a small Proximan task force struck at a gas refinery station orbiting the gas giant Alpha III, destroying it and two Alphan patrol vessels. While this Proximan force was subsequently chased down and destroyed to the last ship, the fact that they had somehow managed to slip through the Alphan lines undetected threw the government into a panic. Reports from the Alphan ships that engaged the Proximans and analysis of the wreckage showed a new level of sophistication in design.

The Alphans rolled up their sleeves and made improvements in their own fleet. Slowly, their advantage returned. Proximan raids continued on a sporadic basis, inflicting damage on Alphan operations but always at a heavy loss to the Proximans. The Alphan government, meanwhile, temporarily overturned their previous "containment only" policy and launched occasional sorties into Proximan space, destroying mining operations on the outer planets and, in a spectacular success, completely destroyed an orbital shipyard that set the Proximan shipbuilding program back at least half a decade. However, it was noted that by this time the Proximans were producing their own fully unique and effective ship designs, free from Alphan influence.

As years went by and the tit-for-tat raids continued, both sides grew weary of the conflict. The Alphan government reinstated its policy of containment and from that point forward showed remarkable restraint and never pressed the advantage into Proximan space. They had grown to understand their enemy by this point and had finally realized that the religious fervor that fueled the Proximan raids would start to die if the enemy remained distant and nebulous. They proved correct as on Proxima, once again, citizens began to question the diversion of resources and the rationale behind the raids. The enemy, to them, appeared to have been vanquished. The government held on, insisting vigilance and a proactive stance was necessary to prevent disaster. Then, something completely unforeseen occurred

The Proxima War

Had humanity chosen the closer but far less likely Proxima Centauri as a first target for exploration, history might be very different. But the Terrans were, of course, drawn to the nearby sun much like their own. The Proximans learned of contact with the new alien race, which threw their governments into a flurry of action. The people of Proxima were rallied once again, to a fever pitch not before attained… hell had allies, now. The incursions would begin anew, leading eventually to enslavement. The hawkish elements of the united Proxima began to exile and silence millions of dissenters who wanted nothing to do with what was coming next…

The Terrans learned of the Proximans from the Alphans. To their credit, the Terrans took the warnings with a grain of salt, surmising that the views they were getting were tainted. For many years, they tried to initiate contact with the Proximans, but were ignored. The Terrans had the best of intentions, seeking to simultaneously make first contact and act as intermediaries to resolve the long conflict. Sadly, the fanaticism on Proxima was once again in full swing, and to the Proximans, they were already in a state of war. On August 2, 2147, soon after the Pathfinder IX survey ship arrived in the Proxima system, it was destroyed.

Even after Pathfinder IX was destroyed, most Terrans were willing to find a peaceful resolution to the conflict. The Proximans, however, were by this point driven purely by paranoia and fanaticism. Expecting retaliation from both the Terrans and the Alphans, the government made plans. They had ratcheted up their shipbuilding and recruiting programs again, and were close to achieving wartime strength. Against a combined enemy, a proactive approach was deemed necessary.

The thermonuclear missiles themselves were simple and rugged. The propulsion and guidance systems were the best Proxima could muster. And the ships that carried them were the latest design, staffed by the most loyal and fanatical of crews. In seconds, major Alphan cities were nothing more than columns of black smoke and radioactive ash. Millions were dead, with millions more to join them in the aftermath. It was January of 2148.

The Terran government was quick to offer assistance and relief supplies to Alpha in the terrible first weeks of the attack's aftermath. Alpha immediately declared was on Proxima and urged Terra to do the same. While roundly condemning the Proximan action, declaring war was a difficult step to take because the Proximans had not yet communicated directly with Terra. In fact, no Terran had at this point even seen a Proximan, except through holos and descriptions from the Alphans. Two months later, however, a further incident occurred that left the Terran governments with little choice.

Regular passenger service to Alpha had been stopped after the attack, both due to security risks and the turmoil of the aftermath. Terran relief groups, however, continued to send personnel, and several passenger lines donated the services of their ships and pilots to ferry them to and fro. It was a case of terrible bad luck that the Interstellar Queen *Tigran* arrived out of warp in the vicinity of a Proximan scouting party, parked at distance and quietly prob-

ing the Alphan defenses for weaknesses. The Proximans immediately made for this target of opportunity. The crew of the *Tigran* picked up the signature of the Proximan drives coming to life, but there was little they could do as they had just emerged from the jump and their power was drained. Meanwhile, Alphan and Terran ships in system scrambled in a desperate attempt to reach the unarmed passenger liner first. After several minutes of maximum acceleration, the Alphan and Terran fleet achieved visual range just in time to watch in horror as the *Tigran* was ripped apart by Proximan missiles, while Proximan ships swooped about, mercilessly picking off the lifeboats and shuttles that had been launched. The smaller Proximan force quickly disengaged as their enemies drew near. Two hundred sixteen relief volunteers and twenty-two crew members were killed in the attack. Fourteen had survived in shuttlecraft that had been spared; had the Alphan and Terran ships arrived just a few seconds later, they too would have been killed. Testimony by the survivors and their rescuers fueled the outrage back on Terra. Massive demonstrations and fiery speeches by politicians of all stripes forced Terran governments to quickly call for a declaration of war from the U.N., which was announced on March 14, 2148. This incident, along with the destruction of Pathfinder IX, is sadly the limit of most of today's youngsters' knowledge of the causes of the war, overlooking the hundreds of years of misunderstandings and bad blood between the Alphans and Proximans that preceded it.

The first year of the war was quiet, as the allies sought to rebuild Alphan defenses and Terra sought to expand her own fleet back home. There was much grumbling about the need for a "quick lesson" to be taught to the Proximans, but such an exercise would have been foolhardy. In February of 2149 the Terran Defense Force was formed by the U.N. to coordinate all Earth national militaries in space. Proxima had achieved its objective; with Alpha reeling and Terra unprepared, it had bought the time it sought to bolster its preparations.

The first allied battle fleet was convened in Alphan space early in January of 2050. It was an odd assemblage of ships and, as history was soon to prove, deeply flawed. The Terrans had not yet fought a full-scale engagement in space, so their ships were designed around simulations and guesswork rather than practical experience. The Alphans, on the other hand, had the experience in fighting; however, their fleet was designed around the idea of containing the Proximans, not engaging their full military might. In addition, their forces were badly depleted after the Proximan first strike (Alphan ships, being fitted with gravity resist, were often based on planets rather than orbital facilities, and so had been struck on the ground).

This motley fleet got its first test only three weeks later, and the results were disastrous. The Proximans struck hard at the Alphan industrial facilities around Alpha III; the allied fleet sallied forth to meet the attackers and soon found themselves outclassed both technologically and tactically. The Proximan ships were more advanced than anything the allies had yet seen, and their tactics were honed by years of raids with Alpha. The allies fought bravely but were soon overwhelmed and forced to retreat inside the asteroid belt.

The allied fleet was nearly shattered, and the Proximans consolidated their position around Alpha III. The Alphans had lost a major source of raw materials as well as important industrial facilities, further hurting their already reeling shipbuilding program. The Proximan hold on Alpha III was thus a major thorn in the Allies' side. At this time, of course, Proxima still lacked warp technology, and early strategies reflected this thinking. As lack of warp drive both confounded quick strikes by Proxima, as well as greatly reducing the capability for escape and re-supply by those units in the

field, it forced the Proximans into large, self-supporting fleet actions. While the Proximan forces may have been technologically superior at the start of the war, the need for large fleet actions made their early tactics somewhat predictable, and their movements easy to track.

However, Alpha III was not easy for the Proximans to hold, and quick guerilla strikes by the Allies over the following year kept the Proximans off-balance. The Proximans tried an advance on Alpha II in July of 2151. Alpha II was a critical prize; if the Proximans could take it, they would have a convenient platform from which to launch attacks on the Alphan homeworld. The Allied response was desperate and fierce. The Proximan fleet was harried on all sides by Allied interceptors that darted in and out of the asteroids. When the fleet emerged, they were attacked from the rear by another wave of interceptors that had been held back while the main Allied fleet engaged them at the fore. Although Allied losses were heavier than the Proximan losses, they managed to inflict enough damage to make the taking and holding of Alpha II impossible. The Proximan fleet fell back and regrouped at Alpha III. The inner system was safe for now.

The Allies knew that eventually the Proximans would develop warp drive, either on their own or by copying a captured system. To this end, Terra began preparations for an invasion of their own system, developing the famous *Three M's* three-tiered defense plan: **M**ines (seeker mines on the outer edge of the system), **M**ajors (Sentinel Majors), and **M**ars (main headquarters of the local defense interceptor squadrons). As it turned out, this system was put in place not a moment too soon. The first use of warp technology in battle by Proxima caught Terra by surprise, but not unprepared.

The military nuances of the Battle for Mars are the most-studied aspect of the Proxima War, and not just among Terran scholars. Argument rages over whether it was an ambitious and well thought-out plan or a rash and terrible miscalculation on Proxima's part. The fact that Mars, not Earth, was the primary target of the coming Proximan strike shows the importance that Proxima had (correctly) attached to the Martian shipyards. If they could destroy or damage Terran industrial capacity, as well as showcase the vulnerability of Terra, they could isolate their enemies by forcing the Terrans to invest their remaining ships in defending their own system. On the other hand, it can be argued that Proxima was foolish not to press their advantage in the Alpha system first; by razing or capturing Alpha I, they would knock the Alphans out of the war, allowing Proxima to concentrate on the Terrans. What might have been is sure to remain a fertile ground for speculation for many years to come.

On August 21, 2152, the Proximan fleet arrived on the outskirts of the Sol system. The daunting size of the Proximan force outstripped even the most generous estimates, and it quickly became clear to the tracking station personnel relaying the data that the existing defense fleet might not be enough to stop it. Messages were quickly beamed to Alpha Centauri, ordering reinforcements from the front-line expeditionary fleets. Throughout the inner planets, people stockpiled supplies and huddled down to anxiously wait.

The Sentinel Major control ships launched from their bases around the outer planets and activated the unmanned Sentinel major weapons carriers parked in various orbits, and this line of defense began to close with the Proximan fleet. By this time the first hits from the seeker mines, seeded outside the orbit of Pluto, began to tell on the Proximan ships. A few hours later, the first wave of Sentinel Majors plowed through the Proximan formation, sowing chaos and inflicting major damage. The Proximans, though they had lost one-third of their entire fleet by the time the Jupiter perim-

eter was breached on August 25, did not slow.

When it became obvious that Mars was the target, Earth's complement of interceptors roared to reinforce their counterparts already beginning to engage elements of the Proximan fleet inside Jupiter's orbit. The Terran defense ships were for the most part old and outmoded compared with the Proximan fleet, but their crews were desperate and determined. Great sacrifices and unimaginable decisions were made in the blink of an eye. Terran CAM 117s bore through withering fire and tore into the Proximan flanks, expending their fuel and weapons in massive gouts before drifting away to be helplessly picked off. Other Terran ships, badly hit or with weapons expended, became battering rams, shielding groups of interceptors behind their bulk and even detonating their reactors in the midst of the Proximan ranks. Still, the enemy came on, throwing up curtains of defensive fire and hammering the Terran lines with hails of rockets and particle beams. As Mars's orbit was reached; groups of Proximan freighters, ignored until now in favor of the enemy capital ships, began disgorging schools of K7 Piranhas, which quickly dived into the atmosphere. They were met there by Terran Vulcans and Thunderbolts, and the skies of Mars lit up with weapons fire.

Meanwhile, the Proximan missile carriers began launching their payloads, targeting Martian industry and the heart of the Terran shipbuilding program. Ground-based defenses knocked down many of these, but a few got through and turned their impact areas into seas of fused glass. The Terran forces were stretched to the breaking point when the first signals from the arriving main fleet reached the relay stations. Both sides intensified their efforts. Finally, it became clear that the Proximan force was too weakened to stand up to the remaining defense forces and the nearing Terran fleet. The Proximans withdrew, having damaged, but not destroyed, their target.

While the attack on Mars had essentially broken the Terran home defense fleet, the Proximans had lost over half of their strength without obtaining their objective. The shipyards were quickly repaired and production was soon back on schedule. Bolstered by this success, the Allies launched a new assault on the Proximan stronghold at Alpha III. While this battle was largely indecisive, the Proximans realized that holding their position there was no longer worth the effort, since their development of warp generators obviated the need for a forward base. Their fleet withdrew in July of 2153. With the exception of Barnard's Star, it was the last time that Proxima would hold any territory in the Allied systems.

At this point, while the Allies had suffered incredible losses of ships and crew, and were barely able to field a fleet, the Proximans had been forced to retreat twice within the space of a year. Despite their numerical and technological superiority, they had been unable to achieve their objectives or hold the territory they had gained. The Terran high command decided to press their perceived advantage, as well as exact a bit of vengeance for the Proximan attack on Mars. In September of 2153 the newly refurbished 3rd Expeditionary Fleet arrived in Proximan space. It quickly became apparent that the capacity of the Proximan shipyards to replace losses had been greatly underestimated. The Terran fleet drew into a defensive formation and were beset on all sides by wave upon wave of Proximan ships. While several Terran ships did escape, the fleet was all but decimated as a fighting unit, and several ships and their crews were captured. It was back to square one again.

The next two years were fairly quiet. Both sides rebuilt their forces and probed the other for weaknesses. There were many minor skirmishes between small groups of ships as each side tested the borders and attempted to glean

information. Twice, Proximan probes broke the outer perimeter of the Sol system and set off the early warning system, but no fleet appeared.

Meanwhile, careful study of captured Proximan ships revealed a peculiar deficit in their scanning technology. It was found that their long-range sensors could seemingly be easily confused by false signals. This knowledge became important in the coming Battle of Alpha I.

In June of 2155, Allied intelligence indicated a Proximan build-up for a fresh assault. It was suspected that the target would be the Alphan homeworld. While the Terran and Alphan fleets were certainly healthier than they had been two years ago, the Proximan fleet was sure to be larger and perhaps better-equipped. Using the newly-discovered weakness in the Proximan scanners, a group of gutted hulks were towed into an elliptical orbit around Alpha I and fitted with remotely-controlled engines and devices that would, to the Proximan scanners, indicate a large and well-equipped fleet. Meanwhile, bogus Allied orders indicating that the suspected target was the Sol system were allowed to fall into Proximan hands. The stage was set, and the Allies could only hope that their guesses were correct.

They were. A massive Proximan attack fleet warped in and headed for Alpha I. Detecting the bogus Allied "fleet" and believing they had caught the enemy off-guard, the Proximan commanders split their forces in two, sending a majority of the heavy ships to intercept the "fleet", keeping it away from the planet while the missile carriers and ground attack craft went to make short work of the apparently undefended homeworld.

Too late, the Proximans realized their mistake. As their commanders uncovered the ruse, the Alphan defense forces rose from their camouflaged bases on the surface while the Terran ships, lying in wait under minimal power behind cover of the Alphan moon, came to life and drove into the phalanx of Proximan capital ships from the rear. The Proximan missile carriers and ground attack craft, missing most of their protective escort, were annihilated. The missiles that they did manage to launch were mostly intercepted, either by ground installations or, in a few cases, by atmospheric defense craft that selflessly guided themselves into the missiles' paths.

Meanwhile, the Terran fleet was in a dogfight with the main Proximan force. The Proximan fleet managed to cut through the Terran line and set course back toward Alpha I, only to be met head-on by the Alphan defense craft that had just finished off the missile carriers. Soon, the Proximans tried to give up the fight and headed for deep space, only to be met by another detachment of Alphan interceptors launched from carriers sent from the bases around Alpha II, which had been quietly positioning themselves to cut off any escape. Pressed on all sides and now facing a numerical disadvantage, the Proximans fought hard but were ultimately destroyed almost to the last ship. This resounding victory is widely regarded by historians to be the real turning point of the war.

The Allies pressed their advantage, engaging Proximan fleets in neutral space and winning additional victories. The Proximans, however, turned two of these defeats into victories in March of 2156. The remnants of two Proximan fleets, engaged and defeated by Allied forces, converged in Alphan space and made a surprise attack on Alpha III, destroying the newly-rebuilt bases and industrial facilities. However, during this battle an Alphan missile struck the Proximan command vessel, killing their top admiral, which was a major blow to Proximan morale and battle planning. While they had destroyed their target, the Proximans

could not hold this prize and were forced to retreat.

The war went on. It became clear during the next four years that Proxima's best shots had been landed, and their military infrastructure was in slow decline. Political infighting on the Proximan homeworld intensified as opposition to the war grew. The lesser nations of Proxima began to resent the fact that their people and resources were being co-opted to fight a war that had been started by one of them in what was increasingly viewed as a poorly calculated bid for supremacy rather than an act of cultural and religious defense. The quick victory that Tanaaikol had promised never materialized, and that nation was forced to divide its attention and resources in increasingly draconian efforts at putting down opposition and keeping its coalition together.

Working together, Alpha and Terra had closed the technological gap and finally began to exceed the Proximan designs. The Proximan Shark interceptor, for example, came into action in early 2156; its impact, however, was diminished as the Alphan Stingray followed just a few months behind and the Terran Hornet a year later. This time gap between the Shark and Stingray marked the last time that the Proximans would ever have even a temporary technological advantage.

As warp generators became cheaper and smaller, and as resources for building large ships diminished, the shape of battle shifted away from fleet actions to quick strikes by small groups of warp-equipped ships. The threat to the Sol system diminished as the Proximan ability and desire to commit resources to another huge strike shrank. Terra was thus able to concentrate more and more of its fleet to the task of containing Proxima from Alphan space. Allied strikes on Proximan forward bases became more frequent and penetrated deeper into Proximan territory. In 2160 they struck into the Proximan system itself, with TDA commandos staring a daring and successful raid on industrial facilities on Proxima V.

In a surprise move, Proximan forces seized the Alphan mining colony at Barnard's Star in November of 2161. This attempt at distraction and at disrupting the flow of raw materials into Alpha's industrial facilities ultimately had little effect, and the colony was re-taken with little effort in July of 2162.

2163 and 2164 saw the jaws continuing to tighten around Proxima. Although the Proximans scored a couple of small successes, foiling a raid by Alphan commandos on their mining facilities on Proxima I and defeating a large Allied strike fleet with the help of a timely solar flare, these were only temporary blips as losses continued to mount. Continued political infighting and outright rebellion by nations on Proxima shook their planetary coalition. Tanaaikol's capitol city was rocked by terrorist bombings, and several officials were assassinated in an attempted coup. By the end of the year, however, the majority government was back in control, extending their iron grip in a series of ever more repressive police actions. While they had the lid on the situation for the moment, the pressure continued to mount. By 2164 repeated Allied raids on mining and manufacturing facilities had slowed Proximan ship production to a paltry 20% of 2155 levels. Advanced ship designs could not be put into production because any stoppage to re-tool the shipyards would be suicidal, and raw materials were now in short supply. The Proximans could only continue with their old designs and repairing and modifying such ships as they had, which were by now hopelessly outclassed.

In 2165, the Allies launched a full-scale invasion of the Proxima system. Starting at Proxima V, they moved inward, securing one planet before moving in on the next. Captured mines and industrial facilities were immedi-

ately turned over to the manufacture of Allied ships. Proximan strikes against targets in Alphan space diminished and finally ceased, as all remaining ships were pulled back to defend the home system. 2165 to 2166 marked some of the most intense ship-to-ship fighting of the war as increasingly desperate Proximan forces began using tactics like ramming enemy capital ships with interceptors or detonating unmanned freighters loaded with warheads, scrap metal, and rocks in the midst of Allied fleets.

In April of 2167, the Allied fleet had reached Proxima II and faced the remnants of the Proximan battle fleet. As the Allies closed in, the commander of this fleet was detained in a mutiny by her senior officers, who were mostly natives of the minor nations of Proxima. They offered to hand the fleet over to the Allies with the understanding that their crews were to be treated fairly and that Proxima was to be spared major bombardment. These terms were agreed to and the war in space ended on April 15, 2167. While these promises were for the most part kept, news and rumors of subsequent atrocities (see below) leaked to the general population of the POW camp to which these officers were assigned. One of them expressed bitter regret at having trusted the Allies in a journal entry, the night before she and her cohorts were murdered at the prison by Tanaaikol loyalists.

The Terran high command had hoped that the Proximans might surrender when pressed back to their home planet, but this was not the case. Tanaaikol still held sway on the planetary surface, and if anything their proclamations

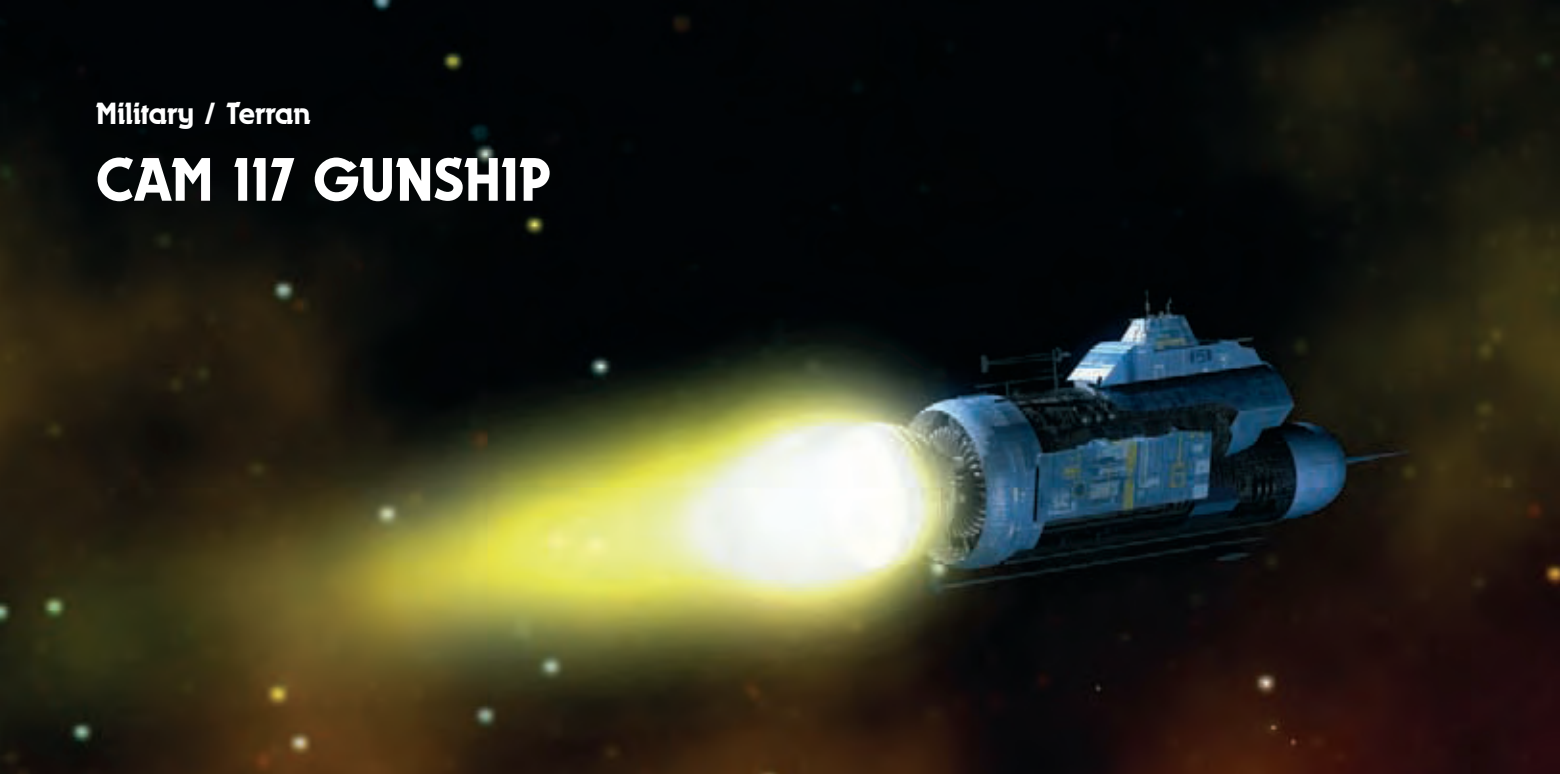
that invasion by the enemy was surely coming actually helped to bolster their position somewhat. By this point, a large faction of Terrans urged an end to their involvement in the war; the threat to Terra had been eliminated, and the resolution should be left to the Alphans. The war had dragged on for almost two decades, and the Terran high command hesitated… how many more lives would be lost to winning a ground war?

However, it quickly became clear that, left to their own devices, some more hawkish types in the Alphan war ring would push to end the war "their way", obviating the need for a ground war entirely. The Terrans responded tersely that they would not allow genocide. A political crisis loomed among the Allies. With a majority of Alphans and a vocal minority of Terran citizens calling for the sterilization of Proxima, cooler heads were brought together and a plan hammered out. It was agreed that Proxima should be rebuilt with a new government, in such a way that a war of this type would not happen again. The point was driven home by a single Alphan elder, standing at a war ring meeting, silently displaying holos of reconnaissance photos of the Proximan surface, showing hundreds upon hundreds of prison camps filled with Proximan political dissenters; the blood of war, obviously, was not on the majority of Proximan hands, and an entire race should not be punished for the actions of one government.

The ground war began in June of 2167. Proximan orbital shipyards, turned over to the manufacture of Allied craft, supplied a steady stream of equipment to ground forces. The Tanaaikol government collapsed in early September of 2167 under assaults by Allied forces and militia groups comprised of Proximan political dissenters freed from the prison camps. Allied forces captured or jammed the main Proximan media outlets and broadcast war news as well as offering the Proximan governments guidelines for surrender. It was a time of pure chaos, as infrastructure, services, and economies collapsed planet wide and roving gangs and warlords held sway over local populations. There were also a couple of incidents that in post-war years would inflame passions and help spark the insurgency that continues to this day. In December of 2167, Alphan troops attacked the Proximan city of Jaßna. The Proximans claim that the city's population, swelled by refugees, might have been as high as 100,000 people. Alphan troops, they claim, went on door-to-door killing sprees, or rounded up and massacred the residents in public parks. The Alphans claim the city only held six thousand residents and was a known stronghold of Tanaaikol government officials, and it was these loyalists that had set fires and detonated stored munitions rather than let themselves be captured. While the real truth might never be known, the recent discovery of what might be mass graves lends terrible credence to the Proximan version. In another incident, in February of 2168, missiles launched by Terran attack ships struck a church that was packed with over 3000 refugees, killing everyone inside; the Terran claims that they mistook the structure for a disguised industrial facility are discounted by many Proximans.

By July of 2168, scattered Proximan units continued to fight in the field, but any large-scale resistance was impossible to sustain. In November of 2168 political leaders from the major Proximan governments gathered with Allied officials at the city of Algol and offered their unconditional surrender; the signing of the treaty on November 1, 2168 finally put an end, after more than two decades, to an incalculably costly and destructive war that had ended hundreds of millions of lives and set back all three cultures by decades.

CAM 117 GUNSHIP



Often described as *'the last of the Dreadnoughts'*, the CAM 117 dates from the pre-war period and was very quickly overtaken by the rapid advance of military technology. In common with most warships of this vintage, it was designed as a purely defensive craft and its range was thus very limited.

It was extremely fast for its day and its top speed would not disgrace many of today's military ships, but this performance was only achieved at the expense of range. During pre-war EU Defence maneuvers there were instances of inexperienced crews maintaining maximum battle speed for a few seconds too long and disappearing helplessly into space with empty tanks. Furthermore, the sight of these massive war machines slinking back to their bases under tow was not uncommon. They were popularly dubbed the *'Nuclear Kites'*.

Whatever their shortcomings in operational range their armament was powerful even by today's standards. The main weapon carried was a massive particle accelerator which accounted for almost a third of the ship's mass. Secondary armament was fitted in the form of various laser projectors and nuclear missile launchers.

Protective armor was kept to a minimum as the original view was that the extremely high battle speed attainable would reduce the chance of a hit. As warships in general became faster this concept soon proved optimistic and the Gunships which saw action were forced to rely on their heavy firepower to keep out of danger.

Like so many other craft which were technologically outdated, these ships were thrown into action in the Battle for Mars in the desperate attempt to halt the Proxima offensive. They did succeed in holding the enemy advance until our front-line squadrons could regroup but at a terrible price. In the running fights against modem ships the unfortunate *Kites* were forced to operate at their maximum speeds for far longer periods than had originally been allowed for. Of the twenty-eight Gunships which fought in this action no less than nineteen were picked off at leisure as they drifted in space unable to reach their bases. The rest were either destroyed in action or simply worn out by constantly having to operate at maximum performance.

Specification - CAM 117 Gunship

Nationality	Terran
Manufacturer	Consolidated Aerospace
Classification	Local Defense Spacecraft
Main Drive	Nuclear/hydrogen CANE IV SuperNova 6 million lbs. thrust
Personnel	34 Crew ✧9 Officers ✧25 Crewman ✧12 MechTech Units
Armament	One NA-117 Particle Accelerator 6 Various Laser Canons Various Nuclear Missile Launchers
Armor	14mm Platisteel Cladding

3D Artwork based on an original work by Angus McKie.

Specification - SSF21D Cutlass

Nationality	Terran
Manufacturer	Various (TTA Licensees)
Classification	Local Defense Spacecraft
Main Drive	2 Avery Sunburst High-Output Engines Total 1,500,000 lbs. Thrust 1 McKinley ion UltraDrive
Personnel	3 Crew ✧Pilot ✧Weapons Officer ✧Astrogation / Computer Systems
Armament	One NA-117 Particle Accelerator 6 Various Laser Canons Various Nuclear Missile Launchers
Armor	High Density Platisteel Armor - 14cm Thick WCRC Type MM 26C Defense Shield

3D Artwork based on an original work by Bob Layzell.

SSF21D CUTLASS

Possibly the best remembered ship of the war, the Cutlass won its laurels during the fiercely fought Battle for Mars in 2152 when the Proxima battle fleet broke through the Sentinel Line. Although of fairly simple construction it proved itself to be efficient and robust, with a legendary ability to absorb punishment.

The first Cutlass was built as long ago as 2123, being intended as a United States Space Command patrol cruiser, and continued in production, virtually unchanged, up to 2148. The outbreak of war interrupted their manufacture for over a year, until the newly formed Terran Defence Authority elected to employ an up-rated version as the basis for the Defence Force.

The production facilities were already in existence and the comparatively uncomplicated design enabled a high manufacturing speed which made the Cutlass a natural choice for a stop-gap fighter. In fact the massive demand for interstellar warships and the impressive way in which the Cutlass acquitted itself in the Battle for Mars resulted in it remaining in production for the greater part of the war, and certainly until Proxima had lost its long-range fighting potential.

Whereas the early US models were fitted with two nuclear powered solid-fuel engines and one liquid-hydrogen cruise unit, the military variant was up-rated with two Avery high-thrust hydrogen drives and an Ion Ultradrive low-thrust engine for long-range cruising. An interesting feature of the Avery high-thrust units was the variable choke venturi tubes, which contracted and expanded with great rapidity to produce a pulsed jet of extremely high velocity by creating an intermittent back pressure. Although very effective, this could only be employed for brief periods as the tubes burned out quickly and had to be replaced.

The payload compartments originally intended to store rescue and emergency repair equipment were adapted as nuclear weapon bays and as housings for the OPA-8 Particle Accelerator and laser-lances.

Major Sven Erikson, a Defence Force Commander, earned himself and his Cutlass a place in the history tapes during the Battle for Mars. The illustration here depicts his best known exploit. His fuelling bay was hit by a Proxima warhead and he launched under maximum drive before refuelling was completed, destroying two enemy ships and allowing the rest of the squadron to get into space to repel the attack. His Cutlass, R2, is shown with the markings of the 3rd Mars Interceptors, with whom he was serving in Syrtis Major.

Since the end of the war the Cutlass has continued in service although no more have been commissioned, and it is a testimony to their durability that several hundred Cutlass' that saw action in the Battle for Mars are still fully operational. Some of these have been leased to the Federal Law Enforcement Authority (FLEA) as local patrol ships and can frequently be seen on patrol around the Solar System.

It is interesting to note that in the current vogue for unusual private spacecraft, a number of replicas of the Cutlass have been produced from the original plans, though fitted with modern commercial and civil equipment.

AAF212 HORNET

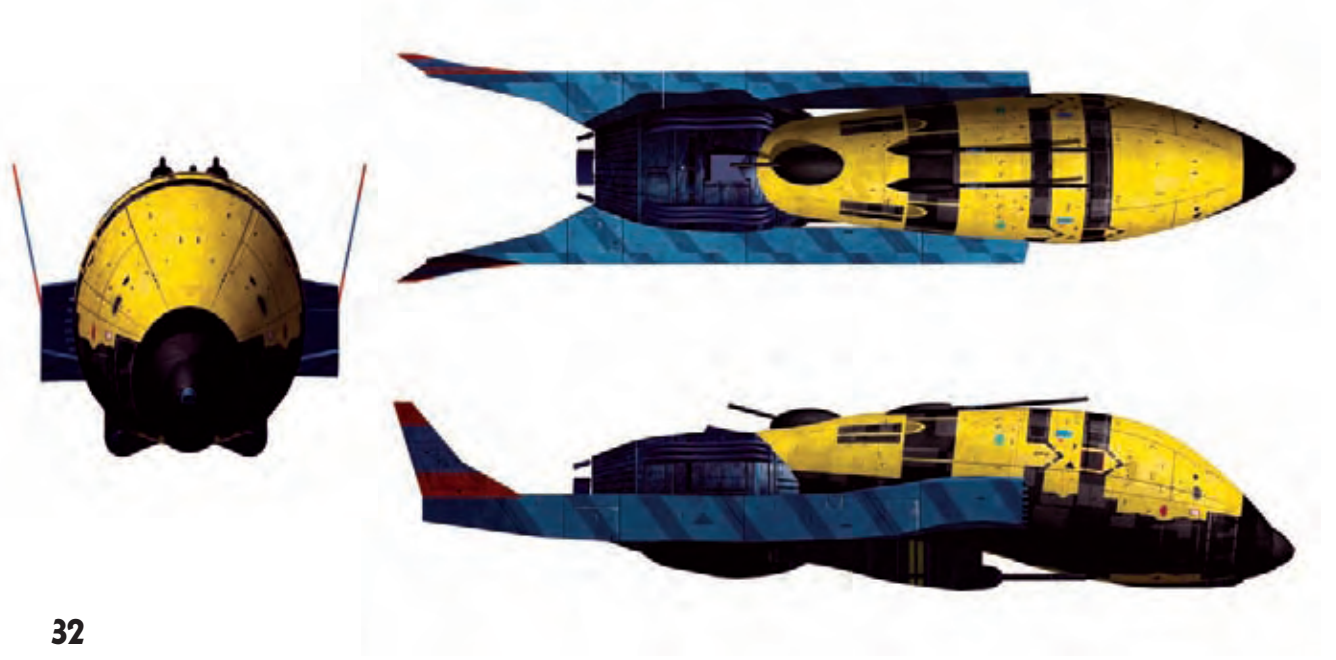
By the time the TDA 107 Partisan was finding itself outclassed by the new generation of enemy interceptors such as the Shark, Avery Astronautics were already testing a prototype for a replacement. Although they had not been asked to tender for such a contract they had seen the need coming and had decided to initiate a development programme as early as 2155. Terran Defence Authority representatives were invited to a display a year later and within a week the first order was placed, the Avery Hornet going into full production.

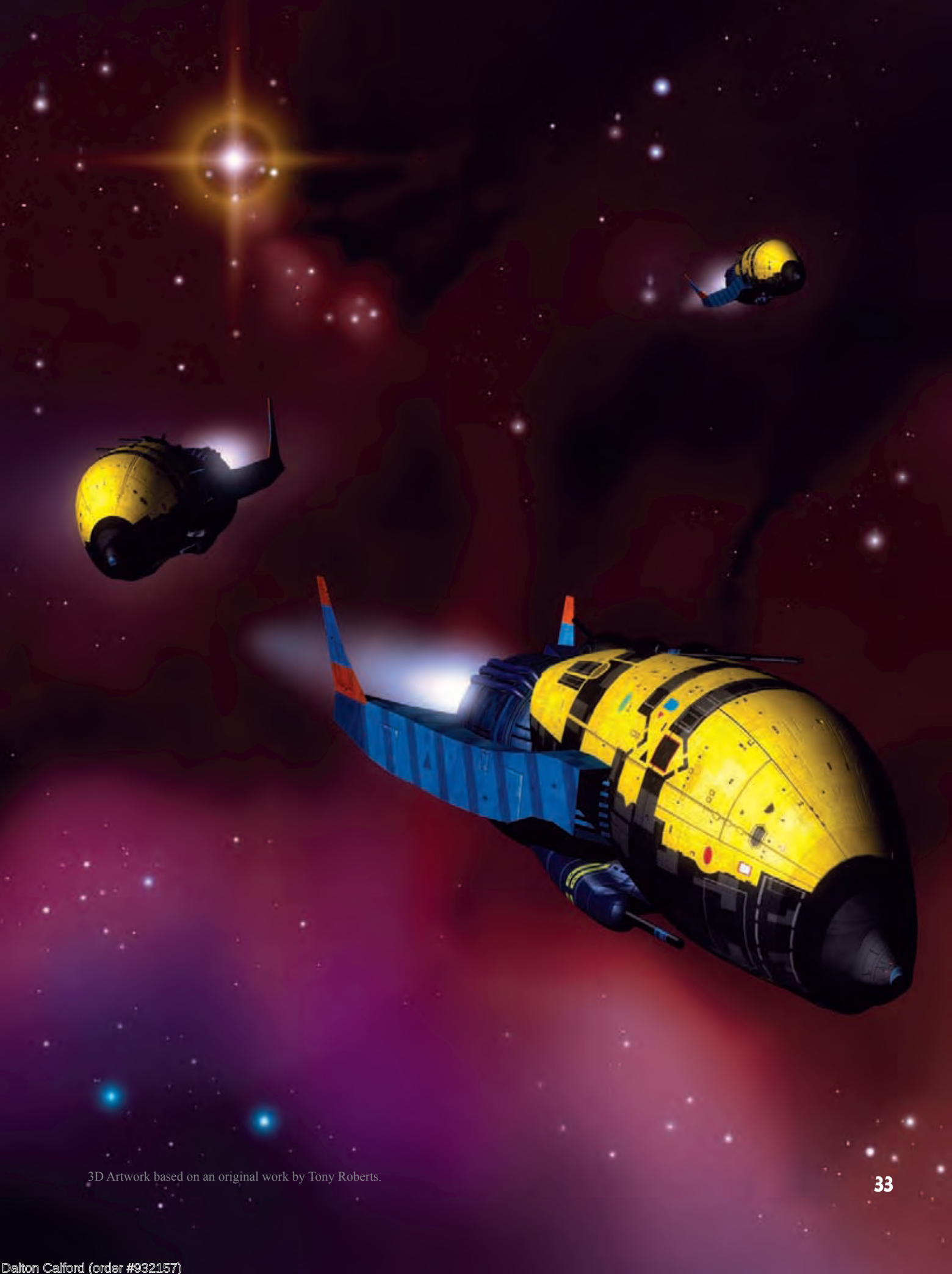
Specification - AAF212 Hornet

Nationality	Terran
Manufacturer	Avery Astronautics
Classification	Long Range Interceptor
Main Drive	DeVass Warp Generator Class VII Avery Javelin Fission Drive - 2.1 million lbs. thrust
Personnel	2 Crew ✧Pilot / Astrogation ✧Weapons Officer
Armament	4 Hardbeam Laserlances Assorted Nuclear Missiles
Armor	High Density Platisteel Armor - 18cm Thick in Articulated Platelets WCRC Type MM 26D Defense Shield

The first squadron went into action in mid-2157 against a strong Proxima seek-and-destroy patrol and was an instant success, destroying four enemy ships against the loss of one Hornet. The Hornet was fast and highly maneuverable and, unlike the Partisan, carried a hard-hitting weapon pack. Additionally, the Hornet's armor was not only of a higher quality than that of its predecessors, but also borrowed from the enemy's K4 Interceptor, the idea of articulated platelets to give flexibility to the hull.

Extremely popular with the frontline flight crews, the Hornets did much to boost morale at a time when the enemy seemed to be gaining in technological superiority. The introduction by the Proximans of the new Shark interceptor had dramatically increased their defensive and offensive capability and the appearance of the Hornet came as an unpleasant surprise. Although the enemy ship was certainly the faster of the two, the Hornet's superior armament earned the ship among the enemy crews the nickname 'Sklathill', which roughly translates as dangerous fish or water creature.





3D Artwork based on an original work by Tony Roberts.

Specification - AAF225 Cobra

Nationality	Terran
Manufacturer	Avery Astronautics
Classification	Medium Range Interceptor
Main Drive	1 Avery Dart nuclear/hydrogen Engine 450,000 lbs. thrust 1 Avery Virabhadra Ramjet Engine 160,000 lbs potential thrust
Personnel	2 Crew
Armament	Assorted conventional rockets & missiles 2 Laserlances or OPA-8 Particle Accelerators
Armor	Layered Platisteel Armor - 12-25 cm Thick

AAF225 COBRA

The Proxima War lasted longer than even the most conservative projections had forseen. Ultimately, however, the war entered its final stages and the action shifted from space to the Proximan homeworld. Avery Astronautics foresaw the need for a surface strike craft able to operate in environments ranging from total vacuum to dense atmospheres, and embryonic Cobra designs were leaving Avery's drawing boards as early as 2155. However, military officials were confident that the Proximans would surrender once pressed back into their own system, before a ground war became necessary. The Proximans, however, withstood the orbital bombardments and became adept at disguising their installations to make any further efforts in that vein next to useless. When it became clear that mopping up on the ground was an inevitable scenario, dedicated surface attack craft suddenly became high priority. However, the Allies had difficulty adapting their existing atmospheric attack craft to Proximan surface conditions, and while they had some success altering certain spacecraft for a ground attack role, these were not ideally suited to the job.

Avery came to the rescue of the cash-strapped government, modifying their design to utilize "leftover" components from other ship systems. They also pointed out that the ground war provided a perfect proving ground at no additional cost. The scattered and weakened Proximan forces meant that there was opportunity to test new designs without significant risk. As a result, Cobra prototypes were shipped directly to the front lines, where they were first deployed in 2167 and became an instant success. Captured Proximan orbital shipyards were soon turned over to the production of Cobras onsite.

Early on, the Cobra at first drew some derisive comments for its asymmetrical design, and its low-cost design philosophy earned it the nickname of "leftovers". However, its performance and ease of maintenance soon trumped any complaints about aesthetics, and "leftovers" became a term of endearment.

The Cobra carried both a conventional nuclear/hydrogen engine as well as a ramjet system. The nuclear turbine was used for operations in airless environments, with the ramjet being utilized within an atmosphere for high-speed cruising, or combined with the turbine for bursts of speed over targets. The Cobra was equipped with a sophisticated terrain mapping system that allowed it to skim very close to the ground on its attack runs. Its speed and low approach angle made it difficult for ground-based gunners to track. The Cobra was also heavily armored, especially around the cockpit, and could survive multiple hits from light weapons and still keep flying.

Weapons packs containing a variety of munitions could be attached and detached from hardpoints under the wings in a matter of minutes with minimal ground crew support, allowing the ship to be customized on short notice to deal with evolving situations. The upper gun blisters also mounted weapon modules that were simply dropped in and plugged into the ship's power couplings. Even the body modules and wing assemblies could be swapped with little equipment. In one incident, a Terran forward base was successfully struck by Proximan raiders, disabling all six of the Cobras stationed there. Within three hours the base commander had taken six damaged Cobras and reassembled them into three operational Cobras, using them to launch a surprise counterstrike against the Proximans forces, annihilating them.

While the Proxima War has officially ended, the Cobra continues to play an important role in winning the peace. As various rogue units of the Proximan military and guerilla forces continue their resistance, the Cobra has been important for its ability to make quick, pinpoint strikes at small targets.

CAM216 VULCAN

The Vulcan was originally developed as an atmospheric / low orbit interceptor designed to operate from Earth's surface. Initial designs were on the boards as early as 2120. Prototypes, designated X-215, were flying by 2123, and regular production began the following year. The early model 215 Vulcan bears only partial resemblance to the much more famous version that fought in the Battle for Mars and is depicted here.

As Mars was chosen as the main headquarters for the local defense squadrons, various ships were modified to better take advantage of Martian conditions. The Vulcan had its wings lengthened and widened to allow better maneuverability in the thin Martian atmosphere, and the engines and other systems were similarly modified. The model 216 Vulcan first flew in early 2133.

However, the shape of warfare was already leaving the Vulcan behind. While not a flawed design per se, it was conceived in and for an earlier era. With warfare moving deeper and deeper into space, the Vulcan found itself hampered by its limited capabilities. While still a formidable oppenent, it was not a nimble as either true atmospheric fighters or newer atmosphere-capable spacecraft, and while able to operate in space, it was designed for quick surface-to-orbit strikes and had very limited maneuverability and range in these conditions. Thus, the Vulcan did not make the transition to space warfare nearly as well as, for example, the Cutlass, which was of the same vintage but one of the first designed strictly for space operations. Experiments with refitting the Vulcan with more powerful and longer-range drive systems met with limited success, as structural issues kept cropping up.

By the time of the Battle for Mars, the Vulcan had long been considered a second-tier defense craft, and seeing its performance against more advanced Proximan ships confirmed this assessment. During this desperate fight, the Vulcan found itself in one-on-one combat with Proximan Piranhas. While the Vulcan had much heavier armament, it had trouble bringing its weapons to bear on its quicker opponents. Its saving grace was that it was a much more robust craft than the flimsy Piranhas, and so could absorb a fair amount of punishment. Still, combat with the Piranhas for the most part kept the Vulcan from accomplishing its main job, which was to be attacking the approaching enemy missile ships and troop carriers.

While the necessities of the war kept the Vulcan in service until the end of hostilities, production was halted immediately after the Battle for Mars. After the war ended the remaining Vulcans were quickly pulled from service and replaced by more modern craft. Some attempt was made after the war by civilian parties to buy surplus models and modify them as low-orbit cargo carriers, but the relatively high cost of operations limited these applications.

A victim of timing rather than flawed design, the Vulcan unfortunately found itself straddling two eras, neither of which it comfortably fit into. There are several complete examples currently on display at the War Museum.

Specification - CAM216 Vulcan

Nationality	Terran
Manufacturer	Consolidated Aerospace
Classification	Short Range Duel Environment Interceptor
Main Drive	CA80 Nuclear/Hydrogen Drive 125,000 lbs. thrust
Personnel	2 Crew
Armament	4 Nuclear Pellet Launchers 4 Assorted Laser Canons or 2 OPA-8 Particle Accelerators
Armor	2cm Plastisteel Armor

3D Artwork based on an original work by Jim Burns.

SENTINEL MAJOR

Within eighteen months of the start of the Proxima War, it became obvious that the Proxima hostilities were going to be considerably more than a brief trial of strength between neighboring solar systems.

Although Proxima Centauri had no equivalent to our warp drive or the Alphan Potential Mass Drive it was recognized that it would be only a matter of time before they either developed a similar system or duplicated one of ours. The defence of our own solar system had therefore to be considered, and this raised a major question, as it had been agreed that the greatest allocation of resources had to be made to the development and supply of offensive craft. The enormous cost of producing a single warship meant that building and maintaining an effective battle fleet would leave very little over for home defence, itself requiring massive investment.

The solution finally agreed was a three tiered defensive system. The Perimeter from Pluto's orbit outwards was seeded with static nuclear mines which were cheaply and easily manufactured and would be a serious threat to craft emerging from a warp jump. They were designed to home in on mass of the order of a warp generator and would take advantage of the short period that any such vessel required to replenish its power banks after a warp jump.

The second line of defence was provided by the Sentinels. The best known of these craft are undoubtedly the Sentinel Majors, whose massive, squat shape and huge main venturi tube are unmistakable.

Only one in five of these ships was manned, the others being no more than powered weapon packs fitted with sophisticated detection and response gear. The fifth vessel of each flight was the manned command centre, which co-ordinated the operations of the weapon carriers.

The Sentinel was fitted with a very large conventional nuclear propulsion system based on liquid hydrogen and oxygen, producing about 5 million lbs potential thrust. This facility allowed it a high degree of tactical mobility, but its drawback was rapid fuel consumption, almost I ton per second. Against this it was reasoned that the armament would be effective enough to ensure that combat would be resolved speedily and would protect the ship when mobility was reduced.

Specification - Sentinel Major

Nationality	Terran
Manufacturer	Various (TTA Licensees)
Classification	Short Range Defense Spacecraft
Main Drive	Consolidated Aerospace Nuclear/Chemical Unit CA 7M 5 Million lbs. Thrust Potential
Secondary Drive	24 Fixed Vector CA 17T Hydrogen Jets 1700 lbs. Thrust
Personnel	Command Ship Only ✧7 Technical Officers
Armament	8 General Purpose Nuclear Rockets 4 "Scatterpack" Nuclear Rockets 4 OPA-8 Particle Accelerators 8 Laserlances 2 Avery Sonic Accelerators
Armor	WCRC Type MM 26A Defense Shield

CAM130 CYCLOPS

The combat history of this obsolete ship was brief by any standard and was eclipsed early in the War by the increasingly sophisticated detection systems employed by both sides.

The design was approved in 2133 after early indications that intelligent life existed in Alpha Centauri and within reach of our Solar System. At that time it was not known what attitude the peoples of Alpha Centauri would adopt towards us, and the Cyclops was introduced as a precautionary measure. We had no long-range ships capable of delivering maximum-effect nuclear weapons to surface targets, and it was this gap which the Cyclops was intended to fill. Little more than a mobile launch platform for the powerful *Vulcan's Hammer* nuclear missile, the Cyclops was not popular with flight crews, being considered by them something of a sitting duck.

The ship's warp generator was situated in a housing which encased the main hull and was vulnerable to any damage. A hit sustained from even low-power secondary armament could therefore prevent the unfortunate crew from jumping clear of the battle zone, and as the ship's main drive was less efficient than that of most current interceptors the chance of survival was slim. Another drawback was that as the ship was little more than a piloted rocket it was severely limited in maneuverability when passing through an atmosphere, which it would do when launching its payload. This also happened to be the point at which it was likely to be subjected to fire from both the surface and other spacecraft. It is not therefore surprising that personnel allocated to these ships were less than enthusiastic.

Despite their early obsolescence they did see action for two brief periods of the war. The first was in the desperate Battle for Mars when every available craft was thrown into the fight. The warhead of the missile usually carried was replaced by an improvised *scatterpack* which on detonation released a barrage of small nuclear rockets. Primitive but effective, this device helped to halt the Proxima onslaught, but at the cost of twenty three ships destroyed.

The second period was during the closing months of the war, when Cyclops were used in the final offensive against the Proxima Homeworld. By this time the enemy's capacity for retaliation was very limited and although two or three of these ships ended their days there none were lost in action.

Outdated before the war had even begun, the Cyclops was withdrawn immediately as peace was declared and was not even placed on the reserve list.

Specification - CAM130 Cyclops

Nationality	Terran
Manufacturer	Consolidated Aerospace
Classification	Long Range Missile Carrier
Main Drive	Consolidated Aerospace CACE 43 Skymaster 1 Million lbs. Thrust Potential
Personnel	4 Crew ✧Pilot ✧Astrogation ✧2 Weapons Officers
Armament	Vulcan's Hammer Space to Surface Missile
Armor	14mm Plastisteel Armor WCRC Type 18A Defense Shield

3D Artwork based on an original work by Colin Hay.

TDA 107C PARTISAN

From about 2053 the pattern of warfare began to change. For a number of reasons, the large-scale multi-ship confrontations of the earlier period of the war could no longer be risked by any of the combatants as losses had been severe on both sides. Gradually fighting resolved itself into smaller scale attacks and counter attacks. Battle fleets became tightly co-ordinated strike units and the requirement shifted from massively armed and armored battle cruisers to smaller, faster vessels with powerful weapons at the cost of less protective armor and equipment.

One of the first examples of this new breed was the TDA 107C Partisan, which is still one of the smallest warp-drive ships ever produced. It consisted of little more than a DeVass generator in an unarmored shell with weapons fitted into the gaps, and a light-thrust hydrogen drive unit stuck on the back.

To pilot these ships required a special kind of courage as the crew lay in cramped positions surrounded by the fuel storage tanks along each side of the hull and the reactor perched above and behind them; but uncomfortable as they may have been, they proved effective and enjoyed considerable success in bringing the War close to the enemy's home.

The first examples were built in the Martian yards but the production lines were moved to an orbiting manufacturing complex off Jupiter when another major Proxima offensive seemed imminent in 2057.

Initially there were many problems with the Parrtisans' detection gear, which repeatedly became disorientated immediately after a warp jump had been made, and several ships were thus lost to the targets they were attacking, but once over come they soon proved their worth in harassing the enemy's supply ships, and were able to strike deep into the enemy's lines before disappearing back to thir bases.

It was not too long, however, before it became apparent that they were too lightly armed to be effective in the long run. As the Proxima detection equipment improved and their own new generation of warships entered service, the Partisan began to find itself outclassed, and was eventually replaced by the more sophisticated Avery Hornet. Nevertheless, it was still far from redundant as a military vessel, and continued to serve as a long-range scout throughout the war.

When the fighting reached the home planets of Proxima Centauri the Partisan again came into its own in the battles for the aquatic world of Proxima IV, as it was able to move easily in the dense atmosphere to strike at secondary targets.

Today, there are few Partisans left. Only two are still operating as military vessels, the remainder having been sold to commercial concerns, where they are used mainly as survey ships by some of the smaller prospecting agencies. There are, however, two good examples in the Mars War Museum although one of these lacks its DeVass generator.

Specification - TDA 107C Partisan

Nationality	Terran
Manufacturer	Various (TTA Licensees)
Classification	Long Ranged Armed Scout craft
Main Drive	DeVass Warp Generator Class VII Consolidated Aerospace CA125 Drive 1,250,000 lbs. Thrust Potential
Personnel	2 Crew ✧Pilot ✧Astrogation / Computer Systems
Armament	5 OPA-8 Particle Accelerators
Armor	WCRC Type MM22 Defense Shield

3D Artwork based on an original work by Angus McKie.

AAF171 PANTHER

One of the first spacecraft designed for an offensive role, the Panther was widely acknowledged as the most capable ship of its day. During early testing, it was found to have structural problems, which resulted in the loss of 2 prototypes before the problem was identified in the manufacturing process of engine supports and wing spars. Due to the anticipated high workload a crew of 4 was deemed necessary, and comprised of pilot, weapons officer, engineer and comm/navigation.

Although primarily a spacecraft, it had limited capability when operating in a planetary atmosphere, and could be employed for surface attack. As better weapons and systems became available the Panthers were upgraded, leading to a huge variety of variants. The first early versions of the now standard Hardbeam Laserlance was originally tested on the Panther E, though it never became standard equipment.

It's greatest achievements came during the Battle for Mars, where it served alongside the more advanced Cutlass. Panthers were available in greater numbers, and while the Cutlass is remembered for many daring individual actions, it was the Panther that formed the backbone of planetary defence. Even so, it became apparent that when pitted against craft such as Proxima's Piranha interceptor, it was underpowered, lightly armed and easily disabled. Entire squadrons were wiped out in increasingly desperate attacks to stem the Proximan assault and the tide was eventually turned, but at a terrible cost for both sides.

Immediately after the crisis had passed, the remaining Panthers were retired from front line service. Many have since transferred to the FLEA (Federation Law Enforcement Authority), and are used for training duties and even target practice.

Some were disposed of to private individuals after they had been stripped of armament and military equipment, but even so, the Panther is becoming and less and less common. The flight of Panthers shown here bear the black and red markings of the 8th Martian Defence Wing

Specification - AAF171 Panther

Nationality	Terran
Manufacturer	Avery Astronautics
Classification	Local Pursuit Spacecraft
Main Drive	2 Avery Starfire Nuclear/Chemical Engines 100,000 lbs. Thrust Potential
Personnel	4 Crew ✧Pilot ✧Astrogation ✧Weapons Officer ✧Computer Systems
Armament	2 Laserlances 12 Assorted Nuclear Missiles
Armor	High Density Platisteel Armor 8-12 cm Thick

TDA 278 BARRACUDA

After the Battle for Mars exposed the weaknesses in various Terran ship designs, the Terran Defense Authority sat down to critically review and overhaul their shipbuilding program. Wartime had forced the ad-hoc modification of such ships that existed, and the designs in the field had, for the most part, never been tested in combat before the Proximan offensive. While the Battle for Mars had taken a terrible toll on Terran forces, it was also a test of fire and the information gained from that engagement would help to shape the "second wave" of Terran ship designs. While modification of existing ships was economical, in the long run it was wasteful if the ships thus produced could not match up effectively with the enemy's forces. To that end, a new three-tiered interceptor system was designed that streamlined the shipbuilding program, made maximum use of scarce resources, and ensured that Terra would not get caught flat-footed again. The first tier was the deep-space interceptor (exemplified by the Hornet). The second was a shorter-range, dual-environment defense ship (the Cutlass, though an older design, was deemed sufficient for this role) that would specialize in planetary defense. The third was an atmospheric fighter of exceptional maneuverability and speed, designed to cope with the enemy's atmospheric craft (like the Proximan Piranha) on equal terms. This role was filled by the TDA Barracuda.

The TDA put out a call for the high-powered atmospheric interceptor in late 2155. The design competition was won not by any of the large aerospace manufacturers, but by the relatively unknown outfit of Dixon-Bourne, designers of atmospheric race vehicles. The design entered production in 2156 and the first units were flying patrols by December of that year.

The Barracuda proved to be as fast, powerful, and maneuverable as advertised. Though unarmored, it was heavily-armed, and simulations suggested that it would be superior to the larger and bulkier Piranha in a dogfight. Barracudas were widely deployed on Mars as well as on Earth, and flyovers of strategically important points were a common sight during the war, both as a training exercise and as a reassurance to the population below.

The Barracuda suffered from a few early design flaws, including a tendency for the vertical stabilizer to delaminate during high-speed maneuvers in Earth's thicker atmosphere; this problem was quickly corrected. Due to its oversized engine, the Barracuda also suffered a great deal of airframe stress, and the technical inspection crews always had to be on the lookout for structural fatigue. In addition, the Barracuda, perhaps echoing its roots in racing craft, proved to be fairly temperamental and had a higher rate of breakdowns and needed more maintenance than originally planned for.

As good as it may have been in simulations, the Barracuda was never used in combat during the Proxima War. A second invasion of the Sol system never occurred, and attempts to utilize the

Specification - TDA 278 Barracuda

Nationality	Terran
Manufacturer	Dixon-Bourne Aerospace
Classification	Medium-range near orbit interceptor
Main Drive	Avery Thunderstroke nuclear / chemical turbine 85,000 lbs. thrust
Personnel	1 Crew
Armaments	Two nuclear pellet launchers Assorted air-to-air missiles
Armor	None

Barracuda during the ground war on Proxima ran into problems as its high maintenance needs made it unsuitable for the rigors of that action. The Alphan military purchased several Barracudas for defense of Alpha I, and they proved as popular with Alphan pilots as they had with Terrans, but Proxima's ability to strike into Alphan space had already been spent by that time. Still, they formed the backbone of several planetary defense units and the Barracuda remains in service to this day.

3D Artwork based on an original work by Jim Burns.

ACM 113 "FATBOY"

Despite its name, the ACM 113, as it was officially titled, was a formidable craft and remained one of Alpha Centauri's standard interceptors throughout the war. Its flight speed was unremarkable even by earlier standards and to our eyes this ship looks a most unlikely vessel, but what it lacked in straight line performance it more than made up for in maneuverability and strength.

It was seeing this ship perform in Alpha One's atmosphere that led our first representatives there to realize that their hosts had the technology to produce an antigravity device. Even to this day, having been assisted by the Alpha Centaurans themselves in developing a similar device, we have been unable to duplicate the performance of the Fatboy.

This bulbous craft has been constantly improved over a considerable period of time and it is not known when the first version was flown. Several vintages were employed during the war but all shared a similar appearance and were easily identified. Due to their restricted operational range they served only as defensive ships and as a result saw little action during the last few years of the war. Two or three squadrons were shipped to Proxima for use as ground support craft but for some reason did not perform so well in the atmospheres of Proxima Centauri's home planets, and they sustained heavy losses before being withdrawn. Although obviously perfectly at home on their own worlds they appear to be highly sensitive to gravitational conditions and have not produced comparable performances elsewhere.

Without doubt the most heavily armored ship of its size, the Fatboy could withstand the most extraordinary amount of punishment. Probably 40% of its mass was Plastisteel armor built up in layers, Between each layer was a unique system of cellular energy absorbent material which meant that the damage could be progressively contained with the minimum contribution to the inert mass. The Alpha Centaurans had never developed the technology for generating an energy absorbent field as we had, with the result that they were further advanced than we in the field of physical armor. When we exchanged our expertise in generated protective fields for their knowledge of gravity resist, they equipped Fatboy with a field system in addition to the Plastisteel armored hull. The result was a ship that could survive most attacks and could only be destroyed through a sustained barrage of hits.

One of these dual protected ships appears in the foreground of the accompanying illustration and is distinguishable from the earlier models shown by two lozenge shaped generators on the upper surface of the hull.

Fatboy is still Alpha's main defence ship but the armor specification has been reduced. This, together with the installation of modern high output power plants, has contributed to an improvement in the speed of this distinctive craft.

SPECIFICATION - ACM 113 "FATBOY"

Nationality	Alphan
Manufacturer	Alphan Collective Manufacturing
Classification	Short Range Defense Spacecraft
Main Drive	Nuclear/Hydrogen Drive Thrust Potential Unknown
Personnel	6 Crew
Armament	Various but usually Laser Canons & Assorted Missiles Launchers
Armor	Energy Absorbent Field Generator Layered Plastisteel & Honeycomb Armor

ACM 118 "MANTA"

The third component in Alpha's traditional military space force was the Manta weapons-carrier, which provided the main offensive muscle. Its disc-like shape was designed to create sufficient lift to supplement the gravity-resist generators, allowing the maximum payload to be carried at atmospheric levels. In some models the generators were dispensed with altogether to enable the ship to carry the giant air-to-surface Buster missiles used in the final offensive against Proxima. Only six of these variants were produced, however, as they were unstable and would have been too vulnerable if the Proximans' ability to retaliate had not been exhausted by that time.

All Alpha spacecraft, military or otherwise, were planned, designed and manufactured by a single government body which was also responsible for their licensing and allocation. Because of Alpha's natural shortage of raw materials the making and distribution of spacecraft were rigidly controlled and commercial concerns needing ships had to be satisfied with the government's allocation.

The ACM 118 owed its existence to the enterprise of a single mining concern which needed heavy-duty atmospheric/space vehicles in excess of its quota. Their engineering division succeeded in devising a design utilizing a powerful manned rocket used for maneuvering asteroids in their mining activities. The airfoil disc was adapted from sections of redundant storage tanks and the entire craft was constructed from existing materials.

Permission was sought from the government to construct three of these ships at the companies expense using reclaimed materials, but the ministry was so impressed by the ships performance in the flight demonstration that they held further trials for the Defence Authority, which had been looking for a new weapons carrier.

Eventually it was agreed that the government should take over manufacture itself in exchange for an improved allocation of existing craft at favorable terms to the originators, and after various modifications and improvements the new missileship went into production.

It proved to be a great success and in fact its performance exceeded the original specifications on which the Authority had been basing its research. Of the three warships in the structure the Manta was the most advanced and has outlived its stablemates by a considerable margin. Even today Mantas comprise about a third of Alpha's surface attack fleet and there are no immediate plans to replace them.

A number were supplied to our own forces during the war in exchange for munitions and equipment and are still serving with our Seventeenth Strike Fleet, notably the famous *Death's Head* squadron which won acclaim during the final offensive.

Specification - ACM 118 "Manta"

Nationality	Alphan
Manufacturer	Alphan Collective Manufacturing
Classification	Medium Range Weapons Carrier
Main Drive	2 Nuclear/Hydrogen Drive 600,000 lbs. Potential Thrust each
Personnel	4 Crew
Armaments	Various Nuclear Missiles
Armor	Energy Absorbent Field Generator

3D Artwork based on an original work by Bob Layzell.

3D Artwork based on an original work by Colin Hay.

ACM 115 "MINNOW"

The long history of antagonism between the two Centauri systems had led the Alpha worlds to develop a highly effective and integrated military system. Each warship produced fulfilled a specific function in relation to the others and, although individually somewhat less advanced than many of our craft, corporately they represented an extremely efficient fighting force. Provided that its component parts were up to strength, the weaknesses of one ship were generally compensated for by the strengths of another.

In accordance with this system, Alpha's Strike Force was equipped with three main types of ship. The heavily armored Fatboy was conceived as the central unit capable of maintaining a steady advance against strategic objectives or a central defensive core. Individual tactical and surface targets were the responsibility of the heavily armed ACM 118 weapon carriers, which would leapfrog the Fatboy squadrons, strike fast and retreat behind the armored line. The third type of ship envisaged was a small, fast craft with prolonged cruising ability whose functions included scouting, tactical support, rapid interception and raiding. This role was the responsibility of the ACM 115 Minnow.

As was true of most ships operated by Alpha Centauri during the first half of the war, the design dated from much earlier. The armament with which the Minnow was equipped proved inadequate once the use of defence shields became widespread, and it proved difficult to uprate them significantly. Additionally, the trend towards multirole ships gradually reduced the effectiveness of Alpha's military structure and the Minnow suffered badly in the transition, as it was neither armed nor protected sufficiently to be competitive.

Minnows saw little action during the latter part of the War until the fighting reached the Proxima homeworld. The surface war here made the agility, speed and range of this craft indispensable to the ground forces and Minnows were widely used in support in much the same way as they had been earlier.

They differed from earlier versions in that they were now fitted with defence shield generators mounted on the upper hull, and carried more powerful laser armaments.

After the war many of these ships were broken up, although a large number were adapted as guided targets for gunnery exercises. It is understood that a few still exist but their whereabouts is uncertain.

Specification - ACM 115 "Minnow"

Nationality	Alphan
Manufacturer	Alphan Collective Manufacturing
Classification	Long Range Interceptor/Scoutcraft
Main Drive	Nuclear/Hydrogen Pulse Drive Potential Thrust Unknown
Personnel	2 Crew
Armaments	Various Laser Guns
Armor	Synthetic Steel (later variant also equipped with defense shields

ACM 122 "BEHEMOTH"

The Behemoth was the Alpha Centaurans' equivalent to the Colonial freighter and was of comparable size and capacity. It is the largest ship in their fleet even today and was produced to accommodate the increase in traffic which resulted from the 2039 Trade Agreement. It was equipped with the gravity resist facility which allowed ships of this size to make surface landings and the generators were housed in four external pods.

During the war most of these craft were commandeered by the military and refitted as supply and fuelling ships and, later on, as troopships. Unlike the Quartermaster, the military version of our Colonial, the Behemoth was equipped with a considerable armament and was intended to serve as a gunship in addition to its other duties. The desire of the Alpha Centaurans to maximize the functions of this vessel is quite understandable in view of the prodigious cost of producing a ship of this kind, but in fact it reduced its efficiency in most respects. The many weapon bays, accompanying control systems and military standard defence shield generators occupied a considerable amount of the available cargo space, thereby reducing the craft's payload. The extra power these facilities demanded also reduced both its performance and its range. The cost of uprating the main drive system to meet the requirements of an effective combat ship would have negated the point of the exercise so the original engines were retained. This compromise made it more of a liability than an asset as a warship, for it proved unwise to commit it to combat without the support of interceptors more usefully employed elsewhere.

An additional disadvantage was the external mounting of the gravity resist generators. Though making sense when the Behemoth was acting as a transporter, they were dangerously exposed to enemy fire and proved a major weakness in this respect. It was not uncommon for these giant ships to find themselves unable to return to their surface bases until repairs to the generators could be effected.

Their lack of success and the number of ships put out of action soon led the Alphas to reserve those remaining for their original task of transportation and supply. Towards the end of the war, the Proximans' control of the air was reduced sufficiently to allow the Behemoth to operate further forward and its armament proved of some value. The illustration here shows an example of this, depicting a troop convoy of these massive ships breaching a line of enemy Watchtowers on Proxima II without the attendance of escorts. Even so they were employed this far forward only because the low gravity of this world would allow them to land even if their gravity resist generators had been damaged.

After the war the Behemoth reverted to its earlier role and can still occasionally be seen in the spacelanes. However, production ceased some years ago and it is understood that Alpha Centauri has developed a new high capacity freighter along the lines of the Colonial III.

Specification - ACM 122 "Behemoth"

Nationality	Alphan
Manufacturer	Alphan Collective Manufacturing
Classification	High Capacity Freighter
Main Drive	Nuclear/Hydrogen Ion Drive 3 Million lbs. Potential Thrust
Personnel	32 Crew 800-1000 Various Robotic Units
Armaments	Assorted Nuclear Missiles & Laser Canons
Armor	Military Standard Defense Shields

3D Artwork based on an original work by Colin Hay.

3D Artwork based on an original work by Colin Hay.

Military / Alphan

ACM 128 "STINGRAY"

These efficient looking fighting machines represented Alpha's second generation of military interceptors and like many ships of this period were multirole weapons able to carry out a variety of functions. Although they operated extensively in deep space they are perhaps best known for their aggressive performance as atmospheric warships in the fight for the Proxima Homeworld.

Specification - ACM 128 "Stingray"	
Nationality	Alphan
Manufacturer	Alphan Collective Manufacturing
Classification	Long Range Dual-Environment Interceptor
Main Drive	Nuclear/Hydrogen Ion Drive (those intended for atmospheric operation were refitted with chemical thrust engines)
Personnel	2 Crew
Armaments	Nuclear Pellet Gun Various Missile Launchers
Armor	Synthetic Steel Armor 50cm Thick Military Standard Defense Shields

In deep space they were perhaps no better equipped than other ships of their kind but proved extremely agile and stable in the moderately dense atmospheres. Their large wing surface gave them the ability to operate in a broad speed range and this coupled with their economical use of fuel and maneuverability made them a dangerous adversary. These characteristics and their armament also made them suitable for ground attack, a role they increasingly adopted as the Proximans' control of airspace diminished.

Still in production, the Stingray was another example of the war period designs which have withstood the test of time.

Civil & Commercial / Proximan

C89F "WHALE"

The Whale, as depicted here under attack from a flight of Alpha Stingrays, was Proxima's most widely used freighter and was introduced about midway through the war. It was a medium capacity craft with a very long range potential and was fitted out in a variety of ways.

The largest number were freight carriers and were almost identical to those operated commercially by Proxima today. Others were employed as fuellers, troopships or even sensor stations and appeared in most theatres of operation. The distinctive globe was a free hydrogen collector/synthesizer which was added to the later ships as a means of extending their range and appeared only on those non-warp ships intended for local operation.

Specification - C89F "Whale"	
Nationality	Proximan
Manufacturer	Kuel'la Aerospace
Classification	Long Range Freighter
Main Drive	Nuclear/Hydrogen Ion Drive Later Models have Proximan FTL Drive
Personnel	46 Crew
Armaments	3 Laser Canons (one fore and 2 aft)
Armor	Proximan SynthSteel Armor 30 cm Thick

K4 "Toad"

The K4 Interceptor was popularly known as the *Toad* with good reason. Although a squat, brutish vessel with a multitude of bulges befitting its nickname, it proved a dangerous adversary for the first half of the War.

During these years the *Toad* was Proxima's primary interceptor ship and was produced in high volume. Although less maneuverable than most of our ships of the same class and even than many larger types, its inferior mobility and speed were compensated for by powerful weaponry and massive protective armor.

This was a formula much favoured by the Proxima General Staff and it was the design basis of a variety of craft produced during the war. Particular features of the *Toad's* armor were its flexibility and the density of the material used. There were several reports of 'Toads' surviving close-proximity nuclear blasts, being hurled out into space intact and eventually rejoining the action apparently little the worse for wear.

They were designed well before the Proxima research teams succeeded in producing warp generators and could not be adapted to carry them. As a result they were used primarily as defence vessels or for attacks on Alpha Centauri, operating in packs of twenty.

In the first offensive against Proxima considerable losses were inflicted on our forces long before they had approached within what was thought to be combat range. It was some time before it was realized how far the patrol and supply network of these ships extended, as Proxima had established deep space penetration before either of us was aware of the other's existence.

Apart from its defensive capacity the role originally intended for the K4 was to spearhead any offensive against Alpha Centauri. As the War progressed it was often used as a ground attack craft but it proved unstable in the thinner atmosphere of the Alpha worlds and many were lost.

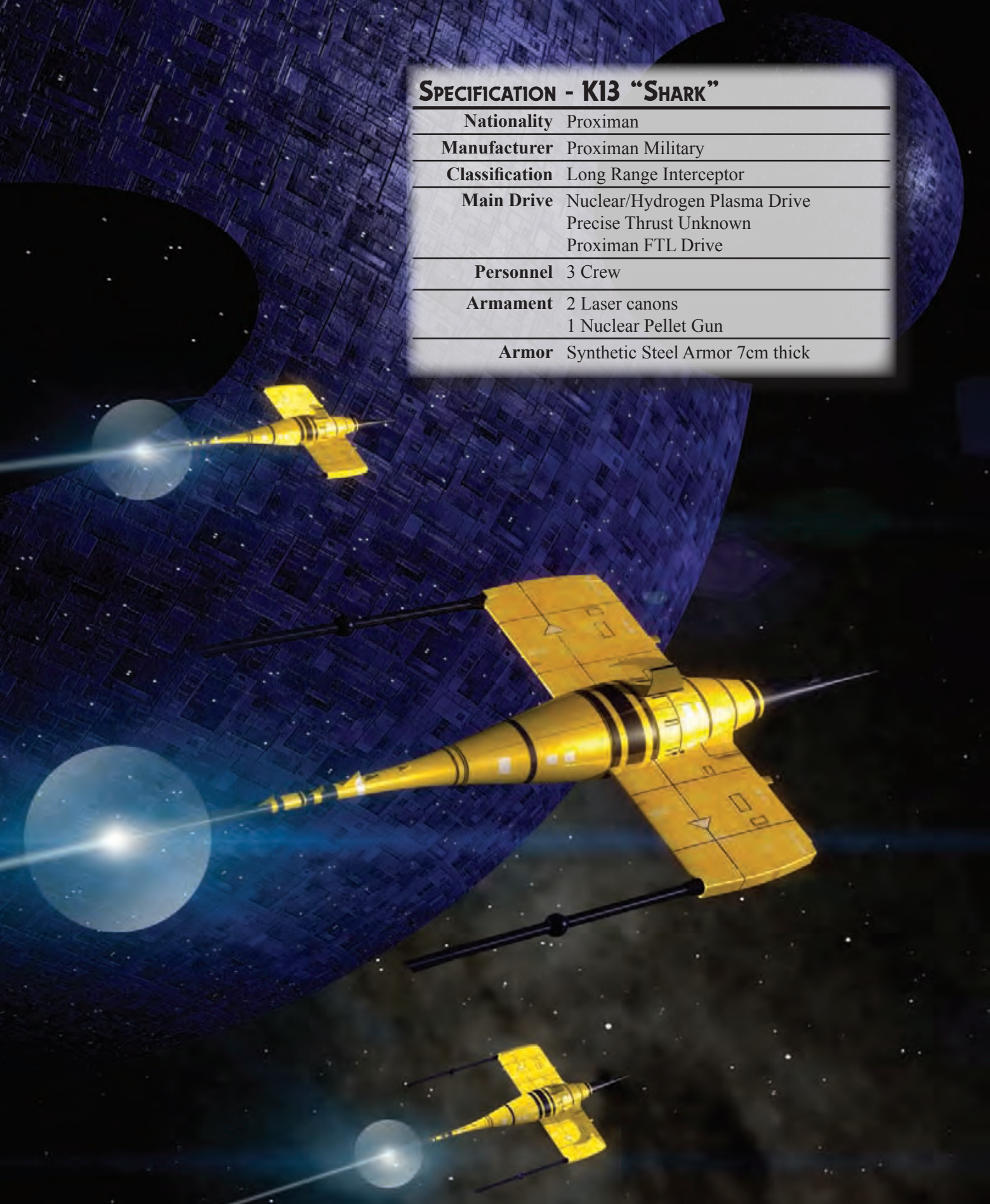
The 'Toads' were one of the few craft to have fought on both sides in any number, as nearly 200 were captured after the deep space patrols were cut off and their supply depots destroyed. Most of these were subsequently handed over to the Alpha Centaurans who had suffered the greatest losses at the outbreak of War and urgently needed ships to contain Proxima until replacements could be manufactured. Although the Alphas continued to use them they were far from ideal due to the anatomical differences between the two species and interior adaptation was never really effective: As our joint offensives took the pressure off their home defence, the captured ships were gradually withdrawn and dismantled. The principal components such as drive units and weapon systems were then incorporated into new Alpha hulls and many of the early Stingrays were equipped in this way.

Proxima's security forces still employ downrated K4s for local patrol work.

Specification - K4 "Toad"

Nationality	Alphan
Manufacturer	Various (under Proximan Government License)
Classification	Local Defense Interceptor
Main Drive	Liquid Hydrogen Nuclear Drive 1 Million lbs. Thrust Potential
Personnel	6 Crew
Armaments	Assorted Nuclear Missiles Sonic Accelerator for Ground Attack Various Laser Canons or Nuclear Pellet Guns

3D Artwork based on an original work by Bob Layzell.



Specification - K13 "Shark"

Nationality	Proximan
Manufacturer	Proximan Military
Classification	Long Range Interceptor
Main Drive	Nuclear/Hydrogen Plasma Drive Precise Thrust Unknown Proximan FTL Drive
Personnel	3 Crew
Armament	2 Laser canons 1 Nuclear Pellet Gun
Armor	Synthetic Steel Armor 7cm thick

3D Artwork based on an original work by Angus McKie.

K13 "SHARK"

This extraordinary warship came as a complete surprise to both the Alphan and Terran military authorities and demonstrated that Proximan technology had reached an unexpectedly advanced level.

The first appearance of these ships was their interception of a patrol of our Partisans heading off a convoy of enemy supply ships. The following extract from a flight recorder salvaged later gives a vivid impression of our first contact with the Shark.

[BEGIN Communications log]
Navigator: There are low-mass objects on the screen, sir, vector beta 229 to 230 approaching very fast.
Captain: Ships?
Navigator: Closing too fast. They're hot though (emitting radiation).
Inter-ship Communicator: Flight disperse, let them through.
Navigator: Bit big for that mass rating. They could...
Inter-ship Communicator: Stand by to evade unidentified objects vector 228 and 9.
Captain: There they are. That's odd.
Navigator: What?
Captain: **(Shout)** Max shield! I think...
[END Communications log]

One crew survived that action but their report did not contain enough information to identify the nature of the attacking ship. All that was obvious was that the Proximans had suddenly acquired a very fast and maneuverable weapon.

These sleek warships began appearing in considerable numbers from early 2156 onwards and the characteristic flare of light from their plasma drive system became an all too familiar sight to our hard pressed crews.

Although the system of accelerating hydrogen plasma through an electro magnetic field was not unusual, the Proximans had obviously found a way of generating considerably more thrust than was thought to be possible with this type of propulsion.

The ship itself was extremely light, armor being minimized in favour of performance, which at least made them easy to destroy if they could be hit. The first Sharks (models K10 through K12) suffered from lack of range as their fuel capacity was limited, but this was improved in later versions by the addition of two hydrogen collectors extending backwards from their *wings*. Although these devices could not replace the gas at the same rate as it was consumed, they were able to extend their range by about 30%.

The armament carried was effective against our Partisan, but later proved to be inadequate once the Hornet had reached our battle squadrons.

The K13's curious array of fins and projections gave rise to their codename (*the Proximan name being Shesh'laan*) and formed part of one of the most sophisticated navigation and direction systems of the Proxima War. Invariably, the Shark was able to take the initiative before being spotted by our crews and it was not until we were able to establish a chain of front-line surveillance stations that this situation was reversed.

K7 "PIRANHA"

The smallest combat craft of the Proxima War was, without doubt, the one-man atmospheric fighter dubbed the Piranha. Fast and highly maneuverable, it proved an extremely difficult target, the only compensation being that it carried very limited armament.

Although conceived as a ground attack weapon, it was later deployed in a variety of roles, being first encountered during the Battle for Mars in 2152. Its small size enabled it to be transported by warp-equipped freighters to the area of operations. There it would operate from the mother ship, but was vulnerable to attack from better equipped deep-space interceptors until it had reached atmospheric levels. Once there, it was far more effective, and during the Battle for Mars, Piranhas succeeded in tying up a considerable number of our Vulcans which should have been concentrating on the enemy troopships and nuclear weap carriers.

While their extremely small ize gave them some advantages, it also m at they were unable to operate for lo g be eding to refuel. To do so they once a un the gauntlet of our deep-space interceptors to reach their mother ships, which were themselves extremely vulnerable. A great number of Piranhas were captured intact because their supply bases had been destroyed and they had simply run dry.

Once the war had reached the Proxima Homeworld itself, it was a different matter, as they were operating continually in atmosphere from permanent and protected bases. The greatest advantage of this type of craft was the fact that it could be produced in great numbers at a fraction of the cost of more conventionally sized warships. As even the most advanced defense shield is limited in the amount of energy it can absorb at any one time, the survival of a warship depends very much on its ability to avoid contact, either through evasive action or by destroying its attacker.

The Piranha made both courses of action difficult. Though unable to withstand much damage and limited in firepower, it was no easier a target than any other type and could attack in sufficient numbers for its corporate volume of fire seriously to damage the target.

Piranhas continued to be a threat throughout the conquest of Proxima as after the successful campaign to destroy their main bases they were able to operate in small packs from easily concealed field depots scattered throughout the battle zones.

After the war, hundreds of them, stripped of their military hardware, were shipped back and made available to the public. In spite of their short operational range and limited capacity they provide a fairly cheap form of private transport until manufacturers can fully re-equip for civil development and production. Many are still in use but they are rapidly becoming collector's items as good examples are increasingly difficult to find.

SPECIFICATION - K7 "PIRANHA"

Nationality	Proximan
Manufacturer	Proximan Military
Classification	Atmospheric Interceptor
Main Drive	Nuclear/Hydrogen Drive 90,000 lbs. Potential Thrust
Personnel	1 Crew
Armament	1 Laser canon, Nuclear Pellet Gun or Particle Accelerator
Armor	17cm Plastic Armor

3D Artwork based on an original work by Tony Roberts.

3D Artwork based on an original work by Tony Roberts.

K34a "TARANTULA"

During the final stages of the Proxima War, the Allied forces suffered greater losses than at any other time during the conflict. In space there had been room for maneuver but on the surface of Proxima I, the last enemy stronghold, this wax not the case. In the bitter, localized ground fighting which characterized this stage of the war our forces had to contend with a number of defensive weapons previously unknown, one of the most fearsome being the Tarantula.

Virtually undetectable in their screened silos, these sinister scarlet painted craft would wait until overrun by our advancing ground forces before blowing off their camouflages covers and erupting from beneath the surface with the shriek of jetstream They were heavily armored and carried the most frightening and indiscriminate weapon of the War. Housed in each of the legs were multiple subatomic particle oscillators (SAPO) able to project an omni-directional field which disrupted the relationships between atomic components.

All matter within an effective range of 5-600 metres was instantly and entirely dispersed, leaving a circle of boiling gases, and occasionally particle collision would set off a chain of nuclear reactions which not only devastated a wider area but destroyed the Tarantula as well.

It was a crude but effective instrument of war which prolonged and almost reversed the course of events, but it had a fundamental weakness in that the enormous power consumption of the oscillators would completely drain the reserves leaving the craft immobile and virtually defenseless.

Hideous losses in men and equipment were sustained before our Forward Tactical Research Units succeeded in finding a counter to the Tarantula's threat. They devised a method of projecting electronic *ghost* images simulating attacking ground forces which would trigger the Tarantula's receptors. Once the craft had ejected from its lair and was trying to identify its target it was vulnerable and could be dealt with by conventional medium-range weapons.

As the War drew to a close, the Tarantula appeared in a variety of forms, although the basic construction remained unchanged. Whereas the early model was fully armored and carried a crew, later models became progressively less sophisticated and eventually were constructed as little more than an unarmored frame containing the control module, propulsion units and the oscillators. These models were unmanned and were guided by automatic systems activated either externally or independently through the machines' own sensors. Many casualties are still being reported, 3 years after the War, as a result of the accidental triggering of forgotten machines.

Specification - K34a "Tarantula"

Nationality	Proxima
Manufacturer	Various (under Proximan Government License)
Classification	Limited Range Defense Craft
Main Drive	Compressed Atmosphere jets Fed by Central Nuclear Pressurization (similar to TTA model PA12)
Directional Drive	Conventional Chemical Thrust Units
Personnel	6 Crew (early models) Later Models Adapted to Remote Control
Armaments	Four Conventional SAPO Field Generators Four Sonic Wave Accelerator Beams
Armor	High Density Plastic Armor 25cm Thick

K9 "GOBLIN"

The war started for Alpha Centauri in late 2048 when the night of Alpha One suddenly erupted in a fury of light and heat. Whole cities disappeared in seconds with nothing but black and lethal columns of gas to mark their passing. The attacking force had been detected some hours earlier but Alpha, though realizing the significance of the fleet of ships, could not mobilize enough ships in time to even slow it down. Surface defences reacted quickly, managing to destroy a number of the enemy ships, but the evacuation of strategic targets had begun too late. Within hours of the first sighting the missiles hit.

Four years later the Proximans attempted the same exercise, but this time the target was Mars. In a lightning dash, a massive battle fleet struck through the outer defences of our solar system intent on destroying the great manufacturing plants supplying our forces. This time, however, it was a different story because, unlike our unfortunate allies, we were already in a state of war. Our Sentinel Majors and local defence interceptors were armed and in readiness for just this eventuality.

Nevertheless, it was a furious and close run struggle. The Proxima ships were, for the most part, more modern and better equipped than the Status Two ships we retained for local defence. It was only the courage and determination of the crews and backup teams that prevented a repetition of Alpha's disaster. Although our losses were high, enough time was bought for our frontline squadrons to counterattack. Inevitably, some of the enemy's missiles got through and there are still areas of Mars which will be unapproachable for a considerable time.

The primary ground effect missile used on both these occasions was the Medusa, a 'dirty' thermonuclear device producing intense radioactive fallout which remains active for many hundreds of years. In size and destructive potential the Medusa was only slightly larger than the one carried by our Cyclops, but possessed a much more sophisticated guidance system, while its own generated defence field made it difficult to neutralize.

It was carried by one of Proxima Centauri's most sophisticated fighting machines, a long range planetary strike ship with a performance matching many contemporary interceptors. It was justifiably the pride of the Proximan fleet and fought in all theatres of the war in a variety of roles. As many of the enemy's ships were not equipped with warp drive due to its late adoption, many Goblins were adapted to mount an interceptor in place of the usual missile. When the Goblin emerged from warp at its jump target the interceptor was released to give support to the missile ships. Although this made it even more difficult for the Allies to seek and destroy the Medusa carriers, it at least meant one less missile to neutralize.

The Goblin was also one of the first warships to utilize the properties of the warp generator by creating a distortion of light reflected from the hull surface to form a ghost image of the ship slightly behind the real craft. This often fooled an attacker's gunnery computer long enough for the approach to fail.

After the war, all the Goblins were impounded by the Allies and served with the peacekeeping forces for some years.

Specification - K9 "Goblin"

Nationality	Proximan
Manufacturer	Various (under Proximan Government License)
Classification	Long Range Missile Carrier
Main Drive	4 Nuclear/Plasma Drive Units 5 Millions lbs. Thrust Potential
Personnel	16 Crew
Armament	1 "Medusa" Computer Controlled Missile Various Laser Canons
Armor	14cm Synthetic Steel Armor Later Models Defense Shield Generator

3D Artwork based on an original work by Angus McKie.

AA010 PATHFINDER

The famous Pathfinder series of exploration and survey craft have a special place in the history of spaceflight, as they were the first to travel to other stars, and carried the first humans to make contact with other space-faring beings.

Although built to a basic design, each ship was customized to suit its intended destination and carried a wide variety of probes, sensors, communications equipment and life support systems. The first ships, Pathfinders I and II, were never intended for interstellar travel and served only to test the various new systems that would be needed when operating so far from the solar system. The decision to use the first generation of DeVass warp generator, together with the ion ultradrive defined the design of the craft. Pathfinder II was lost in mysterious circumstances while on an extended mission almost 1/4 light year from Earth, and this led to a substantial delay in the programme until it was determined that the design was sound, and that nothing in the design or systems were at fault.

The illustration shows Pathfinder VI, in what was the basic configuration, comprising a command module, life support, accommodation and laboratory modules, a module for the stowage and launching of planetary probes, the DeVass warp generator and associated power and control systems, and the ion and nuclear/chemical propulsion. The large vertical arrays were radiators to dissipate the excess heat from the warp generator - a problem with the first generation that was subsequently solved in later versions. Once the ship had arrived at its destination, a detailed survey sometimes lasting 6 months or longer was undertaken, using a variety of unmanned probes, optical, electromagnetic and gravimetric sensors. Later Pathfinders had larger crews and therefore more accommodation and laboratory modules, and uprated propulsion systems. Electromagnetic survey ships deployed large arrays of booms and antennae, much like the later Astrolabs.

It fell to Pathfinder III and its crew to make the first journey to Alpha Centauri in 2036, where the now famous 'First Contact' took place. A total of 15 Pathfinder missions were launched to the nearest stars, such as Barnards star, Lalande 21185 and Tau Ceti, but it is the fate of Pathfinder IX that is usually remembered. While surveying the Proxima Centauri system in 2045, it was destroyed in an unprovoked attack that ultimately led to the dark days of the Proxima War.

Eventually the Pathfinder programme came to an end as technology advanced, leading to newer generations of both manned and unmanned explorers. Most of the ships eventually returned home, including Pathfinder III which is now on permanent display in the Mars museum of spaceflight.

TTA Update: *A recent survey of the mysterious 'Spaceship Graveyard' of Beta Pavonis has found Pathfinder 2. The craft was found completely intact and in working order, but without power. However, of the crew there was no sign, and how this ship came to Beta Pavonis remains a mystery.*

Specification - AA010 Pathfinder

Nationality	Terran
Manufacturer	Avery Astronautics
Classification	Exploration & Survey Spacecraft
Main Drive	McKinley Ion Drive
Secondary Drive	2 Avery Nuclear/Chemical Drive Units
Personnel	6 Crew ✧Pilot ✧Astrogation ✧4 Science officers
Auxiliary Craft	Type 14 Landing Craft / Shuttle
Armor	WCRC type 2D Meterorite Deflector Shield

TTA COLONIAL III

The Colonial was the first of the high-capacity freighters and in its life has undergone a number of major changes.

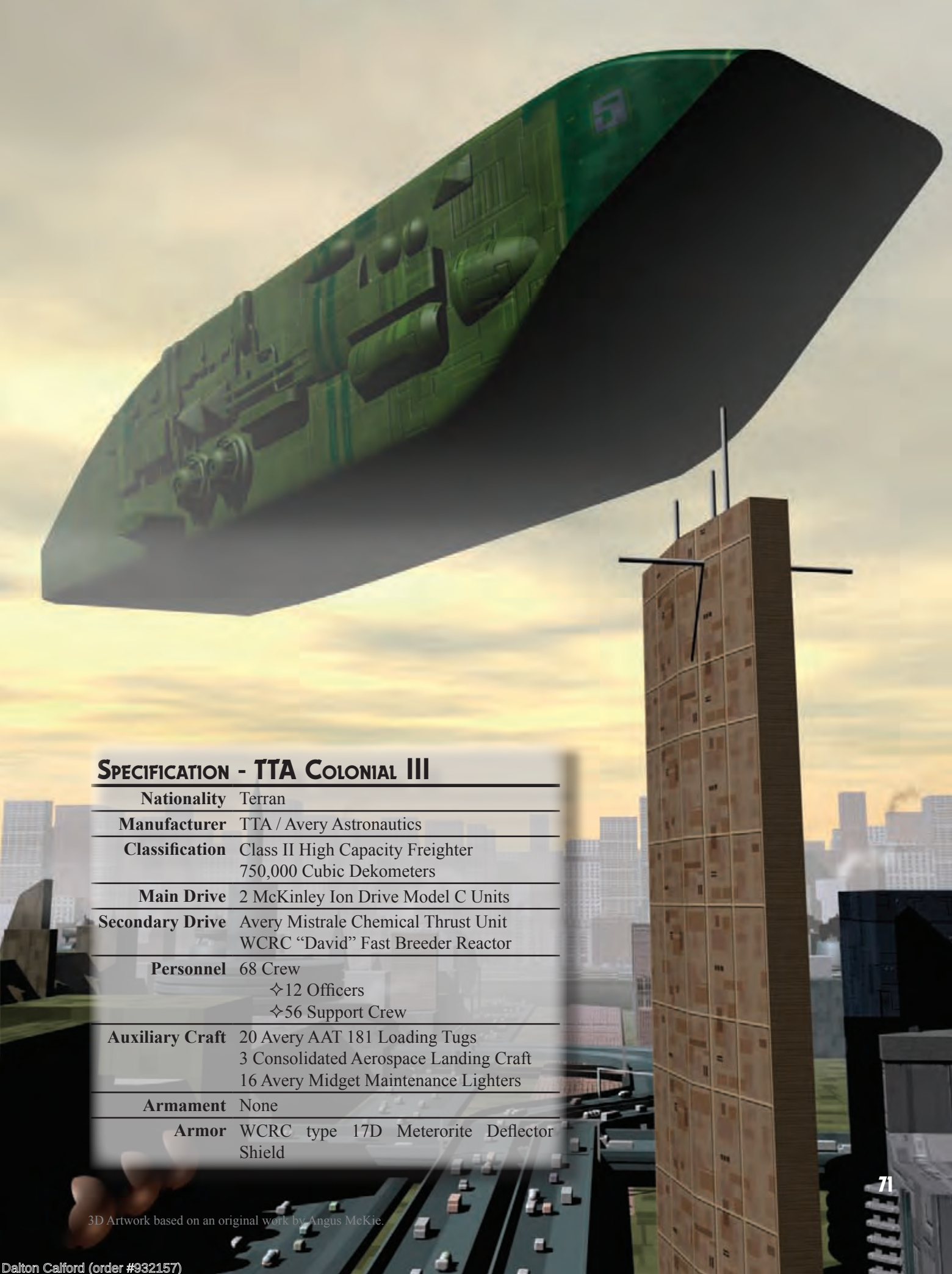
The early models bore no more than a passing resemblance to the one which is so familiar to us today. The Colonial I wait first built in 2004 and was manufactured in the great TTA yards in North Africa with the specific task of transporting the massive amounts of equipment and materials required for the construction of the Lunar Research Station.

In order to make the passage through Earth's atmosphere the hull of the world's biggest spacecraft was equipped with a mass of wing surface and booster rocket packs and looked very different from the clean smooth lines of its descendents. Apart from the enormous cost of operating a ship of this size from surface bases, it was a difficult craft to control until free of Earth's atmosphere; and if launching was dangerous, landing was a spaceman's nightmare. One out of every three landings resulted in damage to the ship of varying degrees of severity and this fact allied with the prodigious consumption of fuel led to a major redesign. From this emerged a sleeker looking vessel lacking the untidy array of projections carried by its forebear and one which required a completely revised mode of operation. It was to operate entirely in space, thereby avoiding the need for the huge kerosene/oxygen thrust engines which consumed fifty tons of fuel every second. Instead the McKinley ion drive, which had been perfected a year earlier In 2013 was fitted, this being sufficient to provide escape from lunar gravity and place the Colonial in a free-fall around the Earth.

Cargo transfer to and from orbit was then effected by the AAT 191 loaders specially designed by Avery Astronautics. These ships were essentially container barges linked form a complete hull, sandwiched between a power section and a manned control module. Once the containers were delivered the fore and aft sections locked together for the return journey. The success of Avery's tender was at least in part due to the ingenuity of their designers in providing an additional function in the containers themselves, for with little additional work they could be interconnected in a number of ways to form a habitable structure. They could be used to form living or working facilities either in space or on the surface and there are plenty of these structures still to be seen.

The successful application in 2040 by Dr Hans Berger of the principle of gravity-resist was probably the single most important benefit gained from our association with the Alpha Centaurans. It certainly transformed the physical appearance of every subsequent spacecraft beyond anything previously conceived, and the Colonial III was the first to he equipped with gravity-resist equipment. Fitted with Berger generators a ship of almost any size or shape could land safely in most gravitational conditions and the bulk of the Colonial III could thus be increased dramatically.

The Colonial series has been in service longer than any other space freighter and It's contribution to our expansion into space is immeasurable. Although no examples of earlier versions exist, the Colonlal III and its military variant, the Quartermaster, remain n the freighters most usually seen in the spacelanes.



Specification - TTA Colonial III

Nationality	Terran
Manufacturer	TTA / Avery Astronautics
Classification	Class II High Capacity Freighter 750,000 Cubic Dekometers
Main Drive	2 McKinley Ion Drive Model C Units
Secondary Drive	Avery Mistrale Chemical Thrust Unit WCRC "David" Fast Breeder Reactor
Personnel	68 Crew ✧12 Officers ✧56 Support Crew
Auxiliary Craft	20 Avery AAT 181 Loading Tugs 3 Consolidated Aerospace Landing Craft 16 Avery Midget Maintenance Lighters
Armament	None
Armor	WCRC type 17D Meterorite Deflector Shield

3D Artwork based on an original work by Angus McKie.

3D Artwork based on an original work by Colin Hay.

MRT 114 MULE

This industrious little craft is the most recent in a long line of working ships and can be seen in various guises throughout the Sol system and beyond. Wherever there is industry, the Mule Multirole tug is to be found busily carrying out a wide range of functions. The basic design has scarcely changed in the last forty or fifty years, as there seems little to be done to improve it. The modifications that distinguish the various models have mostly been concerned with improvements to its ancillary equipment or power system.

Probably the most familiar version is the one which can be seen in all older spaceports and transfer stations, where tugs are employed to assist the docking of liners and freighters. The newer stations are, of course, equipped with automatic docking facilities but even these usually have their contingent of Mules for maintenance, loading and emergency work. These models are easily identified by the large external pod beneath the main hull, housing the powerful directional electromagnet used to maneuver the docking vessel.

The best places to see the Mule's many variants are undoubtedly the fabrication yards, particularly those orbiting Mars. Here they can be observed executing most of the functions for which they can be equipped and our illustration shows two gantry tugs manhandling a giant spar section for a new orbital manufacturing complex.

The lower half of the central pylon is fixed and contains the bridge and control center of the craft, the gantry turret forming the upper part. On those models equipped with photo welding and cutting lasers, the layout is almost identical, but without the articulated jib. The laser projectors are mounted on slender stalks projecting from the rotating band, here carrying the main hydraulic pistons. Cable or pipe-laying tugs are again almost identical but are easily distinguished by the large drum mounted above the bridge, giving the ship a markedly top-heavy appearance. The two plates projecting from beneath the ship are electromagnet grips and are used for either carrying less bulky loads or for anchoring the vessel to a surface.

Other variations are sometimes difficult to identify as modifications are not readily apparent, such as fuellers, or those designed for handling fissionable materials where heat or radiation resistant hulls are used.

Specification - MRT 114 Mule

Nationality	Terran
Manufacturer	Avery Astronautics
Classification	MultiRole Tug
Main Drive	Nuclear/Liquid Fuel WCRC David Fast Breeder D6 Reactor (housed in main hull supplying 3 engines, one mounted on each outrigger and one hull-mounted)
Personnel	6 Crew

AA C14 TRANSPORTER

This primitive looking craft was once the mainstay of Terran logistics transportation. Designed around a modular format, the centre section could be configured to transport gases and liquids, dry goods, ores and metals, equipment or personnel, with standard propulsion, equipment and crew units at either end. For years, convoys of these craft traveled the solar system, and played an important role in the colonization of the Moon, Mars and the moons of Jupiter and Saturn. In it's military role, it supplied the front line Skybase network with fuels, equipment and ammunition. It is a testament to the flexibility of the original design that it remained in service for many years beyond it's designed life expectancy. Ultimately they were replaced by the far larger and more capable 'Colonial' series.

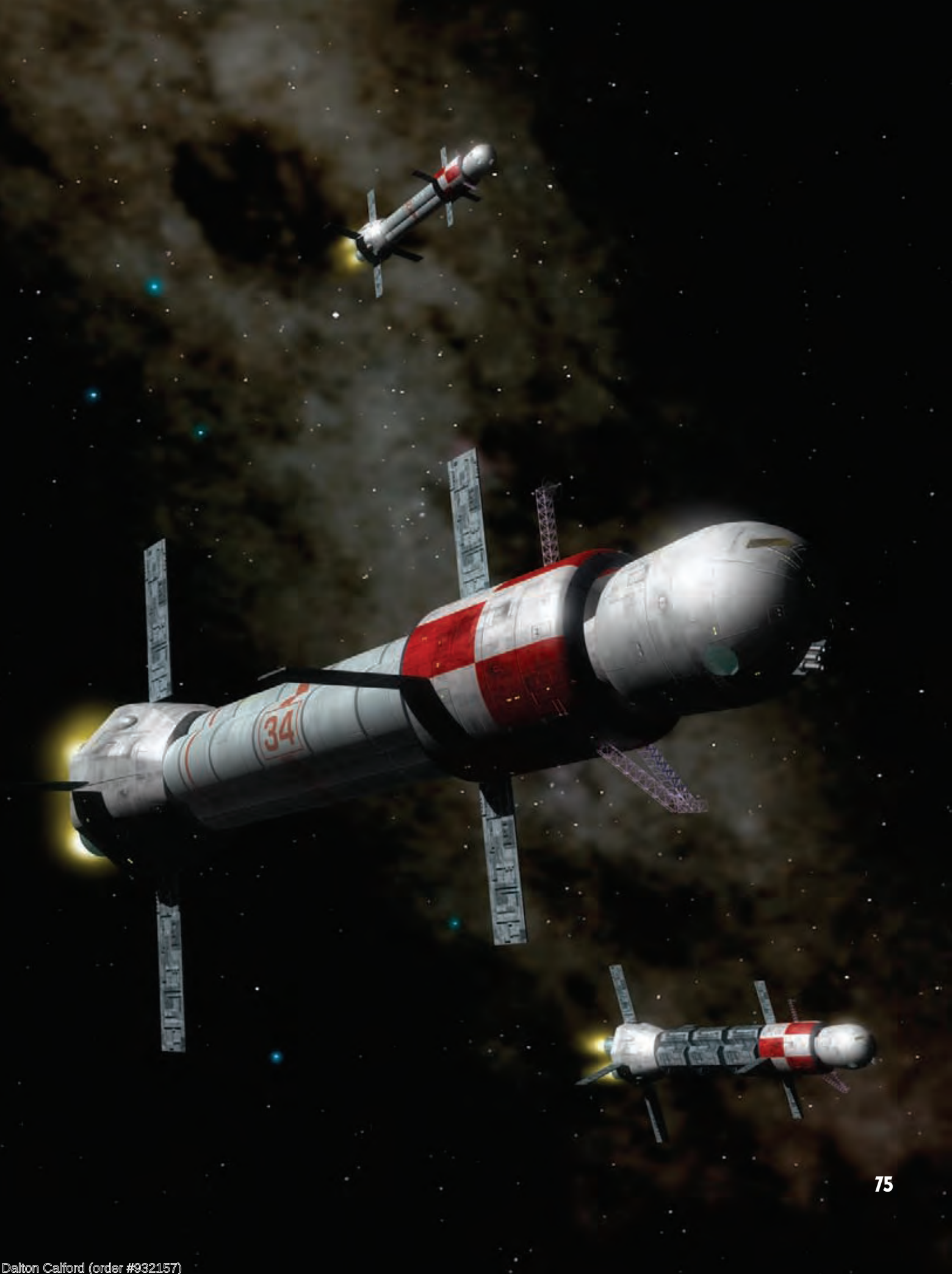
Although the ships were cramped and poorly equipped by modern standards, they were fondly remembered by their crews, who frequently served aboard them for many years. Ships were sometimes given colorful nicknames which became well-known amongst the crews, replacing the more usual registration codes. Notable amongst these were the 'Tin Cow', 'Connie IV' and 'Ford's Transit'.

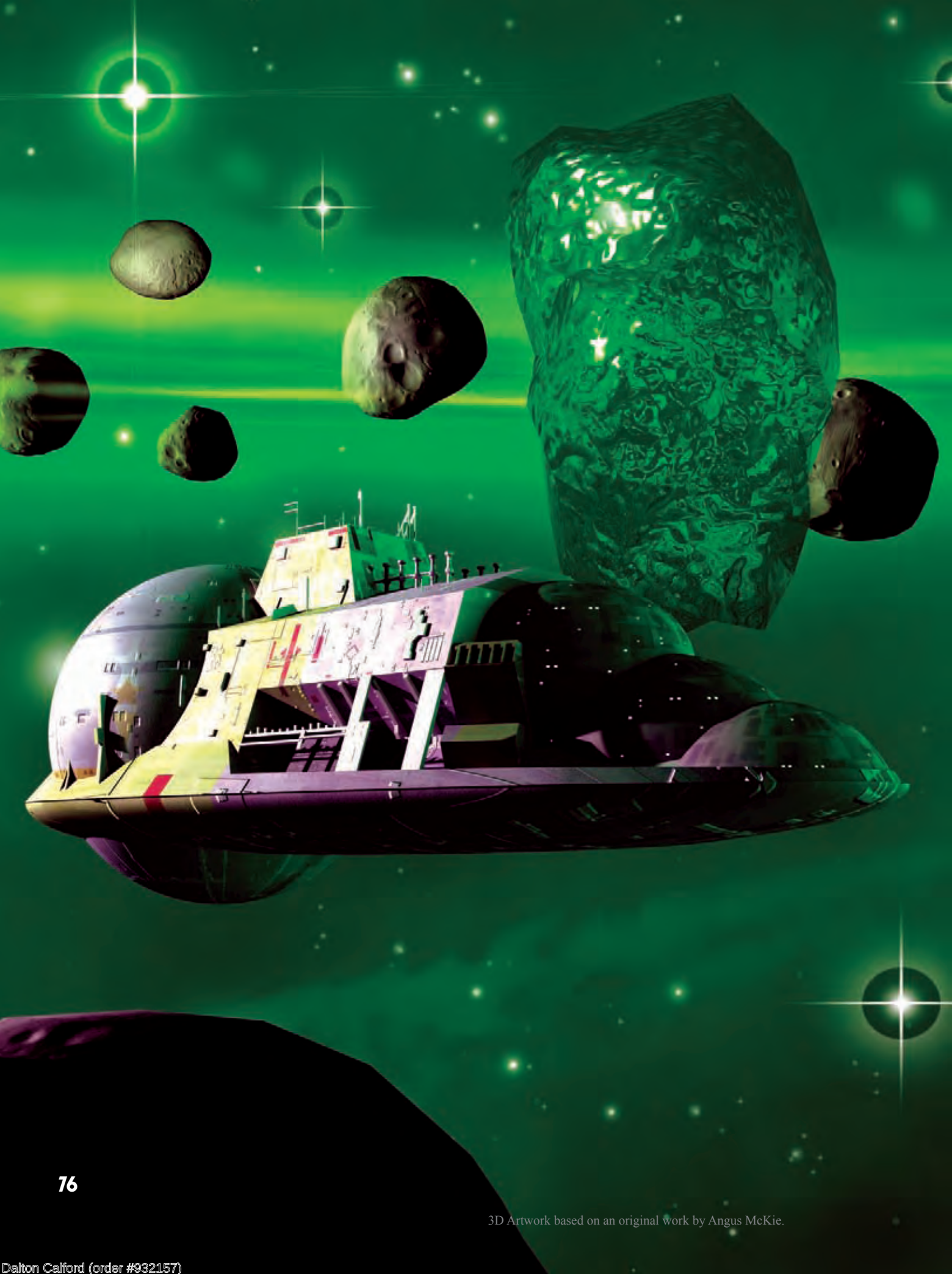
Crews became very competitive and would try to outdo each other in the amount of cargo carried and time taken on routes. Over the years the ships became extensively customized, to the extent that only their own crews could service them.

However, by the start of the Proxima wars, the C14 was obsolete and could not be upgraded with better armor or defence shields, and many were lost to enemy action before being withdrawn to serve out their final days in the rear. No serviceable examples are known to exist, having either been lost in combat, broken up or cannibalized for spares, although several derelict hulks still orbit the outer worlds.

Specification - AA C14 Transporter

Nationality	Terran
Manufacturer	Avery Astronautics
Classification	MultiRole Tug
Main Drive	Nuclear/Hydrogen Drive CMM III Combined 4.5 million lbs thrust
Personnel	8 Crew
Defense	6mm Plastisteel Cladding





3D Artwork based on an original work by Angus McKie.

ASTROLAB

The Astrolabs, of which there were nearly thirty, are often mistaken by the casual observer for fuelling stations. This is an understandable error as they were an adaptation of the fuel supply ships developed during the war and which are still to be found along the spacelanes.

Large numbers of these supply ships were manufactured to service the huge battle fleets of the Proxima Wars, their job being to collect free hydrogen and other gases from space, process them, and store them until required.

After the war many of them became redundant and were thus available for other uses. Some were bought by commercial concerns to generate private liquid gas supplies or simply to provide storage facilities, and a number were allocated to the Research Council, which was short of funds and needed ships desperately. They were ideal for conversion into mobile research stations and could be modified fairly easily for this purpose. They had the added advantage of enjoying a high degree of independence, being naturally self-sufficient in terms of fuel supply. Whereas the original ships possessed a storage globe at either end, the Astrolabs retain only one, the other having been converted into living quarters able to accommodate up to two hundred personnel. Most of the central factory section was then reconstructed to provide laboratories and research facilities. Probably the most distinctive of the Astrolabs are those used for plotting radio emissions, which have been totally encased in a delicate tracery of antennae and receivers. They are an extraordinarily beautiful sight but are rarely seen as they operate far out on the Perimeter.

The illustration shows one of the more usual units working in the rings of Saturn. This type can occasionally be seen by travellers within our Solar System.

Motive power is provided by one of three nuclear piles coupled to fairly small ion drive engines for extended cruising potential rather than rapid acceleration. Only five of the Research Council's twenty-eight Astrolabs have been equipped with warp generators for interstellar research, including the three radio emission labs.

Specification - AstroLab

Nationality	Terran
Manufacturer	Various (conversions primarily by Consolidated Aerospace)
Classification	Class II Mobile Laboratory
Main Drive	McKinley Ion UltraDrive Model E WCRC Bowman III Reactors
Secondary Drive	Consolidated Aerospace CA 6 WCRC David Reactor type C4
Personnel	12 Flight Crew Up to 180 Laboratory Personnel
Auxiliary Craft	2 MRT 114 Mule Tugs 4 Avery Midget Maintenance Lighters 2 Consolidated Aerospace Landing Craft
Defense	WCRC Type 17F Meteorite Deflector Shield.

AVERY-FROST ORION

Space racing became popular towards the end of the century once the economy had recovered sufficiently from the war effort for private ownership of spacecraft to be possible. The first race held was sponsored by the Confederation of Shipbuilders with a view to stimulating public demand for such craft. The entrants were teams representing most of the important manufacturers and the ships themselves were all prototypes of potential production models. The race was intended as a showcase for all the makers but as the market at the time was extremely limited the spirit of competition was fierce.

The course was designed to show off the performance of the ships in both space and atmospheric conditions and ran from Miami Spaceport, round the moon and back to Earth. Public holovid screens were set up in centres all round the World and Mars and the whole course was covered by camera ships. The race was rather unspectacular in comparison with later ones as the ships were all built to production specifications, but after the Austerity it was a welcome relief and generated a great deal of excitement.

The winner was the Keeble-Springer Dart, which as a result was one of the four craft to go into production.

In subsequent years the nature of the races gradually changed as personalities and privately entered craft became more significant than the manufacturers' teams. Increasingly the craft became more competitive, and machines built specifically as racers began to dominate the field. The famous exception to this trend was the AveryFrost Orion which, although basically a production craft, in racing trim was a consistent winner for a number of years.

Without doubt one of the most popular private craft even today, the Orion was designed by René Lenain of R. Frost Engineering and produced by Avery Astronautics in the old North African Yards.

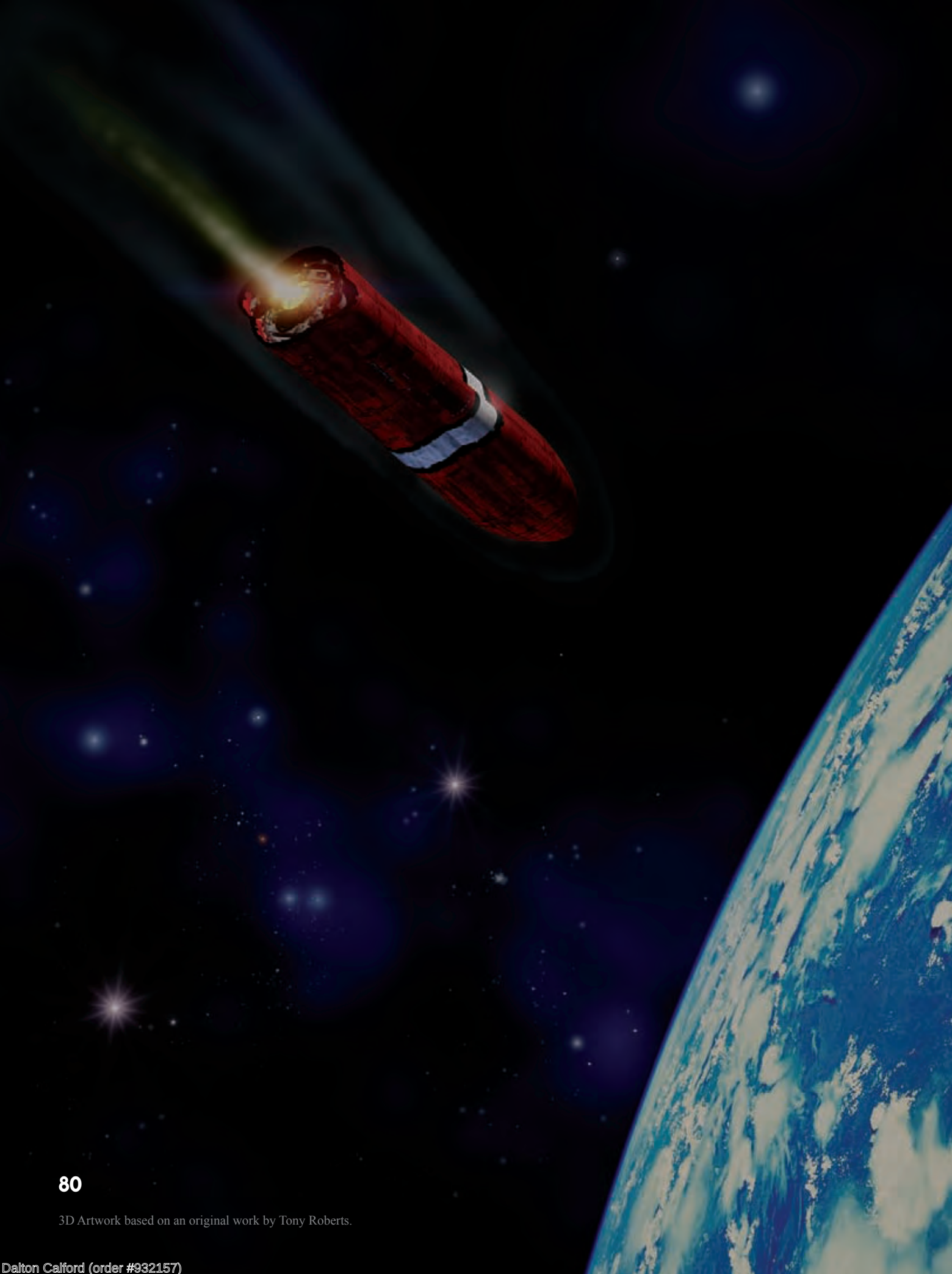
The main difference between the racing and production versions was in the method of propulsion, the former being fitted with a liquid bipropellent system using oxygen and hydrogen to generate about 240,000 lbs thrust. Range was drastically cut in favour of maximum speed, and this configuration was obviously unsuitable for private use as the operating costs were prohibitively high. A purchaser of an Orion had a wide range of thrustpack options to choose from, the most popular being the dual system specified here, which represented a good compromise between performance and range.

Specification - Avery-Frost Orion

Nationality	Terran
Manufacturer	Avery Astronautics / R. Frost Engineering
Classification	Private Cruiser
Main Drive	Avery StarDriver PNH IV Nuclear/Hydrogen Drive 250,000 lbs. Potential Thrust
Secondary Drive	McKinley MegaCruise Ion Drive 100,000 lbs. Potential Thrust
Capacity	Pilot + 1-6 Passengers
Defense	TTA CNIL AM4S Defense Shield

The racing scene is now mainly the preserve of specialist concerns and private teams and few of the purposebuilt craft are suitable for general production. There are, however, many smaller club events where the Orion is still a common and successful entry.

3D Artwork based on an original work by Bob Layzell.



3D Artwork based on an original work by Tony Roberts.

BE28 SKYMASTER

Badger Engineering has earned itself a fine reputation as one of the most inventive and industrious of the many small outfits catering for the shipbuilding trade. Based in England, Earth, Badger started by manufacturing electronic packs which were modular units designed as plug-in replacements for damaged or obsolete circuitry. Before long they were providing complete kits to update or modify existing craft, and had started to undertake the repair and renovation of the hulls themselves. As interest in out-of production ships grew, they found themselves increasingly involved in the restoration of obsolete or rare models and this now accounts for over half their business.

With their considerable experience in this field and the obvious demand for unusual private ships, the next step for them was to produce and market their own. Their close associations with the Terran Trade Authority, a major client, resulted in the opportunity to purchase the last twenty of Consolidated's SCF 28 freighters, which were due to be replaced.

As a freighter the SCF 28 had been overtaken by new techniques in transport and shipping, but was economical to run and had ample hull-space for Badger's purpose. In addition it possessed one other valuable attribute in that it was a famous ship.

During the invasion of Proxima the Terran Defense Force had used SCF 28s as personnel carriers and the sturdy little ships became a familiar sight as they scurried to and fro ferrying supplies and reinforcements in and wounded men out, often under heavy fire. Their moment of glory came when a strong Proximan counterattack cut off our forward command base in the battle for Kelorth, the Proximan capital. Two groups of SCFs went in, the first as a decoy and the second to evacuate the staff. The operation succeeded but twenty-two of the thirty ships were destroyed.

Badger Engineering renovated and completely refitted the hulls, with up-dated engines and their own electronic packs. The interior fittings were then made to the individual customer's specifications, and the Skymaster 28 was an instant success - so much so that Badger received enough orders to justify manufacturing completely new ships from the original plans.

Although eighteen were produced in this way the license fee paid to Consolidated for the manufacturing rights made the Skymaster an expensive craft, and Badger began to look elsewhere for a successor. They found it in the SSF 21ll Cutlass, one of the best-known of the early days of the war, and the manufacturing rights were bought outright from the Defense Authority. Five replicas of this famous ship have been produced and the order books are full, but it is a different machine from the Skymaster 28. The latter is slower and more sedate but is still in demand because of its low running costs and large cabin area.

Specification - BE28 Skymaster

Nationality	Terran
Manufacturer	Badger Engineering (under CA license)
Classification	Private Cruiser
Main Drive	Avery StarDriver PNH VII Nuclear/Hydrogen Drive 150,000 lbs. Potential Thrust
Secondary Drive	McKinley MegaCruise Ion Drive 100,000 lbs. Potential Thrust
Capacity	Pilot + 1 to 12 Passengers
Defense	TTA CNIL AM6Y Defense Shield

AA01 MARTIAN QUEEN

In early 2115, fare-paying passengers stepped aboard the first purpose-built interplanetary spaceliner to a fanfare of publicity which was to make the name of Martian Queen a household word. Representatives from every region of the World Community had gathered in the departure lounge of Miami Spaceport to take part in this historic inaugural flight to Mars. Speeches, toasts and a holographic presentation of the ship's development were beamed to every part of the globe, until eventually the crowd of passengers boarded the bus to take them across the apron to where the great ship lay.

Little of her could actually be seen as she was cocooned by sonic filter screens which also covered the launching ramp, but her size was staggeringly apparent. Finally the passengers were aboard and settled into their luxuriously appointed cabins. The sound of her engines became audible even through the screens, as she moved ponderously up the ramp, to emerge In a thunderous roar of engines at full thrust. Within minutes she was out of sight and a new era had begun.

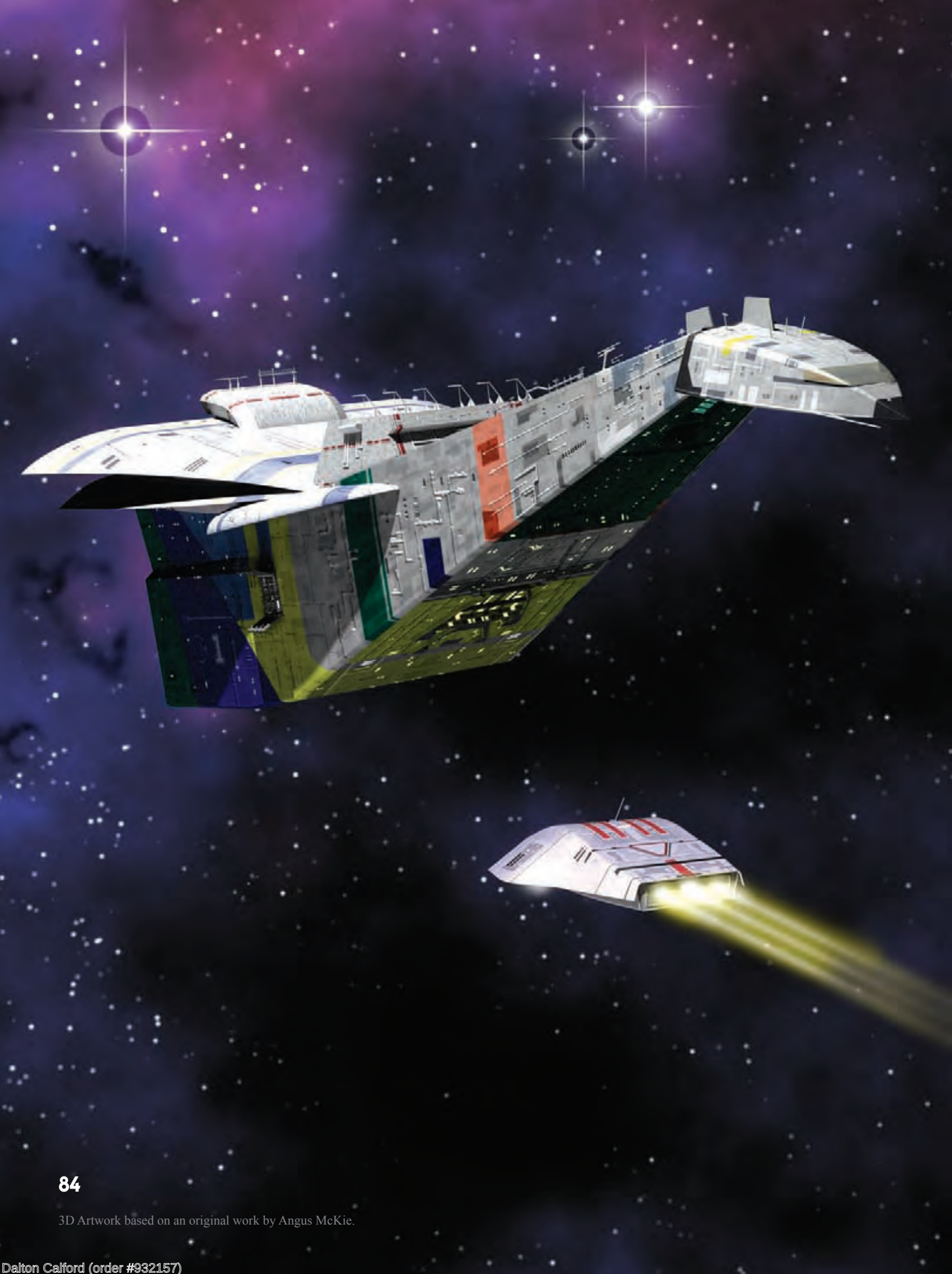
The Martian Queen was the first of the Queen ships operated by Trans-Galactic Spacelines. A total of eight entered service, although five of these flew either as ships licensed to other spacelines or were commissioned for military use.

During this period private spacetravel was an expensive luxury and those fortunate enough to afford the experience expected value for money. The early Queen liners were correspondingly sumptuous, each interior being designed and built by world-renowned artists and craftsmen. However, as technology advanced and the demand for cheaper and more widely available services grew, so the Martian Queens became outdated and eventually were either withdrawn from service entirely or refitted for greater carrying capacity. Their successors, the Galaxy Queens, represented a very different breed of vessel and perhaps made a much greater contribution to interplanetary travel by bringing this facility to a for wider range of people than had previously been possible. Families who had been transported it) the Martian Industrial Centres could now hope to we friends and relations they thought had been left behind on Earth for ever. In fact the new accessibility allowed the growth of the many secondary industries now to be found on Mars.

Specification - AA01 Martian Queen

Nationality	Terran
Manufacturer	Avery Astronautics (licensed to Trans-Galactic Spacelines)
Classification	Spaceliner
Main Drive	3 Avery Meteor Directional Thrust Drives 500,000 lbs. Potential Thrust Each WCRC bowman Fast-Breeder Reactor
Secondary Drive	2 Avery Harmony Solid Fuel Drives 100,000 lbs. Potential Thrust Each
Personnel	24 Crew ✧8 Flight Officers ✧4 Technical Officers ✧12 Cabin Crew
Defense	None

3D Artwork based on an original work by Bob Layzell.



3D Artwork based on an original work by Angus McKie.

AA47 INTERSTELLAR QUEEN

Anyone who has visited a major spaceport will have seen the distinctive and elegant shape of the world's most advanced spaceliner poised for its next journey into deep space. The Interstellar Queen is the most recent of the Queen Line ships and the only one designed to operate between the stars. It was introduced in 2046 to meet the growing demand for access to Alpha Centauri, following the Trade Agreement signed with the inhabitants of the double star system in 2039. Though highly regarded by both crew and passengers it was soon apparent that its carrying capacity was too limited for the ship to be commercially successful, and work then started on the development of a far larger sister ship.

Before this project had passed beyond the initial design stages, fate intervened to postpone further progress until 2063. In late 2047 the Pathfinder IX survey ship operating near the red dwarf of Proxima Centauri was attacked and destroyed by a military patrol from that system. A few weeks later, an Interstellar Queen emerged from warp to start the run into one of the Alpha Centauri worlds, only to be completely obliterated in a further, unprovoked nuclear attack. The war which was to involve three solar systems for fifteen years had begun.

Although two or three of the Interstellar Queens were operating during the War period, the remainder were laid up until hostilities had ceased. They then continued to operate on all runs until their new sister entered service in 2171.

The Interstellar Queen Mk II was very much larger vessel, though retaining the unmistakable family resemblance of these liners, and was designed with cabins for up to six hundred passengers, with extensive leisure facilities. Most of the Mark I's were then refitted to operate within our solar system as, without having to accommodate the massive power demands of the Devass generators, they could be operated economically.

Although less sophisticated and with fewer leisure facilities than her big sister, the Mark I is one of the most beautiful ships produced. Her clean, sleek lines are a perfect example of the successful marriage between technology and aesthetics and will set an example for many generations of astronautical engineers to come.

Specification - AA47 Interstellar Queen

Nationality	Terran
Manufacturer	Avery Astronautics
Classification	Spaceliner
Main Drive Mk1	2 McKinley Ion Drive Units 1.2 Million lbs. Potential Thrust
MkII	3 McKinley Argosy Ion UltraDrive Units 2 Million lbs. Potential Thrust
Secondary Drive	Avery Mistrale Nuclear/Chemical Drive
Personnel Mk 1	43 Crew ✧7 Flight Officers ✧4 Technical Officers ✧32 Cabin Crew 280 Passengers
Mk II	79 Crew ✧6 Flight Officers ✧5 Technical Officers ✧68 Cabin Crew 600 Passengers
Defense	WCRC Type 17b Meteorite Deflector

ACC1 STARBLADE

The newest and to many people most beautiful spacecraft to enter commercial service is Alpha Centauri's passenger liner, Starblade. This striking and original design represents the first step in Alpha's drive to expand her interests in the travel industry. Until recent years the passenger transportation market has been dominated by Terran ships such as the ubiquitous Interstellar Queen. The rapid growth in the volume of tourist traffic to the exotic Alpha Centuri planets has always been encouraged by the Alphans as a means of supplementing their limited industrial export revenue.

In the past their investment program has been geared towards providing suitable facilities and attractions within their system to stimulate the development of the tourist industry. Once the pattern of growth appeared to be firmly established, they directed their attention to the possibility of providing the means by which the tourist travelled to and from their planets.

Considerable funds were allocated to the design and development of a craft suitable for this purpose and the result wait the Starblade. The entire program had been cloaked in utmost secrecy and even the prototypes' test flights were conducted under maximum security.

The first Starblade to enter service in 2073 did so in the greatest blaze of publicity the worlds have ever known, and there can be few people who would not recognize this glittering vessel.

Advertising superlatives aside, the Starblade is undoubtedly one or the most advanced ships of its kind and possesses many features which set standards for all subsequent spacecraft.

Although its passenger accommodation offered an extremely high degree of comfort there was nothing revolutionary about it. The real innovations were not visible to the casual spectator and lay in the ship's warp guidance system. Until now, a ship emerging from a jump could never be sure of its exact position, and to be safe Jumps were always calculated within acceptable margins. This meant that re-entries always left an appreciable amount of space to be crossed under conventional power. The journey time was also increased by the need for vessels to recharge their power banks after the enormous drainage that resulted from such a jump. The Starblade possessed a warp monitoring system sophisticated enough to let the ship emerge from a jump so close to the destination that the minimum of charge time was required to provide enough energy to reach the target point.

Once there, of course, there was sufficient time to complete the recharging necessary for the return journey. This reduces travel time by almost sixty per cent and the saving in conventional fuels means that the Starblade can undertake more voyages in a given time with lower running costs than any of her competitors.

Specification - ACC Starblade

Nationality	Alphan
Manufacturer	Alphan Communal Shipyards
Classification	Spaceliner
Main Drive	Nuclear/Hydrogen Ion Drive Alphan
Personnel	96 Crew ✧6 Flight Officers ✧8 Technical Officers ✧82 Cabin Crew 680 Passengers
Auxiliary Craft	2 ACC28 Space to Surface Shuttles
Defense	Alphan Standard Anti-Particle Shield

3D Artwork based on an original work by Colin Hay.

3D Artwork based on an original work by Tony Roberts.

ACC3 STAG BEETLE

When the Proxima Wars ended in 2068, there was a shortage of many materials, particularly fissionable elements such as uranium and its derivatives, and those rarer elements for which no synthetic substitute had been found. This problem was particularly pronounced for the Alpha Centaurans, whose indigenous mineral resources were unusually poor, though until the war they had enjoyed an abundance of the necessary materials mined from one of the planets orbiting Barnards Star. This is a type M Red Dwarf Star attended by four tightly grouped planetary bodies, one of which was extraordinarily rich in valuable minerals and also held captive a dual ring of heavy metal satellites. In the course of one of Proxima Centauri's last large scale offensives this planet was entirely desolated and is still virtually unapproachable.

The ACC3 was designed to break down and process the orbiting chunks of matter, of which there was fortunately a vast number, certainly sufficient to satisfy the basic needs of the manufacturing complexes at home until a way could be found to restore the facilities on the mother planet —something, incidentally, which has still to be achieved. The active section of this strange looking vehicle was the 'head' with its characteristic 'antlers'. Three of these antennae are the field projectors for the Disassembler system, and operate when the ship is positioned with a suitable satellite in the area between the antlers. These projectors then transmit the field which breaks down and separates the various elements of which the object is composed. The other two projections are collectors for absorbing and refining the ores before passing them back to the storage holds. The bulk of the ship is little more than a vast barge which can be detached when full and exchanged for an empty one. The full hulls are then locked together in groups of four or six and transported by a warp or potential mass type tug to their destination.

No main drive of any kind is fitted to the ACC3 as none is really necessary, small directional jets being sufficient for positioning and the short passages from target to target. The ACC3 is probably one of the most impressive and efficient pieces of ore recovery and processing equipment in existence, and thus it is understandable that the Alphans have consistently declined to make its technology available as part of any trade agreement.

Although these craft are not available for purchase, they can be leased with Alphan crew and technicians in quantities of two or more and are operating with several of the larger mining concerns. Many of these teams are working our own asteroid belt as their efficiency, speed and low operating cost make the extraction of small amounts of ore commercially viable. ACC3s can be observed at work quite easily from passenger liners passing through the belt to Jupiter. There is also a contingent attached to the Research Authority and the barges sometimes arrive back at Mars base.

Specification - ACC3 Stag Beetle

Nationality	Alphan
Manufacturer	Alphan Communal Shipyards
Classification	Ore Extractor / Processor
Main Drive	None
Secondary Drive	Conventional Nuclear/Hydrogen Navigational Jets
Personnel	8 Technical Crew
Defense	Anti-radiation and Meteorite Deflector Shield

PC1 191 GOURMET

Though certainly not one of the most beautiful objects to be seen in space, the Gourmet is a product of Proxima's post-war industrial development program, and as its name suggests, is an extremely efficient and discriminating piece of ore processing equipment. As an independent and self-transporting device it is usually classified as a spacecraft, but it functions primarily as a mining tool operating on fixed sites.

The war had left Proxima's industry in a shambles and the widespread use of ground-effect nuclear weapons by both sides had rendered many of her own planetary mines unusable.

Alpha Centauri had for many decades depended on off-planet sources for her supply of minerals as her own were relatively poor, and Proxima was forced to follow her example until the means could be found by which her existing mines could be reopened. The Gourmet was one of the first examples of the equipment evolved to exploit the enormous amount of mineral-rich materials to be found in free space.

It was revolutionary in concept and incorporated a number of innovations demonstrating a high degree of technological sophistication. The machine was constructed to carry out two separate tasks at once so that mining and processing became a single integrated function.

The ship operated by identifying and locking onto a suitable *target* which could be of any size from a small asteroid to an area of planetary surface. The forward section, which was a high-output directional furnace, would then begin to reduce all the matter beneath the main body of the machine to a liquid state. Within the hull itself was a mass simulator developed from an Alpha gravity resistor. The fields were reversed and the small gravitational forces would draw the liquids into analyzer filters which separated the various elements. These could then be synthesized immediately into a variety of alloys, shaped and deposited for collection by conventional freighters.

The crew's quarters were situated in two modules above the stern of the ship which also served as the control centers, and although there was room for up to thirty personnel, most of these vessels operated with crews of seven or eight.

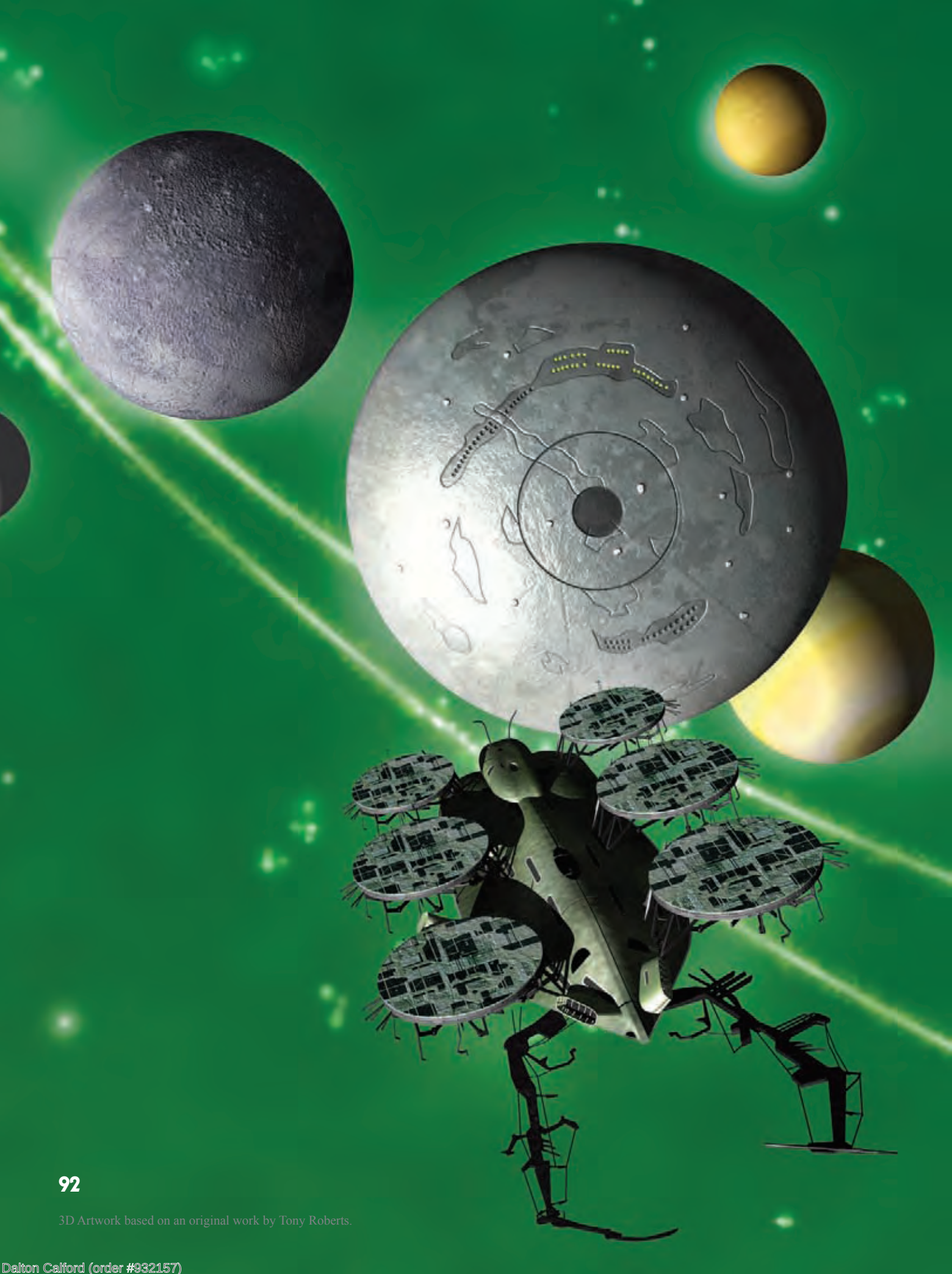
The early models were not regarded favorably by the Alphans nor the Terran Trade Authorities as their method of working resulted in a considerable amount of highly radioactive waste being scattered through their area of operations. This problem was eventually overcome and all models currently working are *clean*.

The TTA has purchased a large number of Gourmets since their introduction. Most of these are working in our own asteroid belt, either in the Nationalized Fields or under private lease.

SPECIFICATION - PC1 191 GOURMET

Nationality	Proximan
Manufacturer	Korvath-Loel'U Industries
Classification	Mining/Ore Processing Spacecraft
Main Drive	Hydrogen Pulse Drive Approx. 2,8000,000 lbs. thrust
Personnel	6 to 30 Crew
Defense	Standard Proximan Deflector Shield

3D Artwork based on an original work by Bob Layzell.



3D Artwork based on an original work by Tony Roberts.

K34 BEE

Roughly the equivalent of our own Mule, the K 34 is a general-purpose service vehicle which can be found operating in a wide variety of roles and situations. In terms of usual applications the Mule is generally considered to be the superior piece of equipment, but the Bee does have certain individual advantages. It is larger than its Terran equivalent and is equipped with an extremely sophisticated computerized control system which allows a fine degree of remote guidance. This suits it for use in environments which are too hostile for organic life-forms such as those with excessive temperature ranges or high radiation levels. The Proximans are somewhat more advanced in terms of electrical engineering than we are, and the K 34 is representative of their proficiency in this field. Apart from providing energy for the craft's equipment, the highly efficient solar collector /transducers in the distinctive dish-like receptors are able to generate an arc of sufficient strength for a low-output plasma drive engine. This enables the Bee to operate almost indefinitely, having to return only for the servicing and replacement of its mechanical components.

There are, of course, deficiencies. In the case of the Bee one major weakness is the limit of the power that can be developed by this means. Although adequate in terms of its mechanical functioning, the thrust potential of its drive system sometimes proves to be insufficient for many tasks. As a result there are occasions when three or four craft have to be used where one conventionally powered ship would suffice.

This method of power generation also automatically excludes them from working for any useful period of time in `dark' environments such as the blind side of planets or satellites. But this is only the case if there is no light source within easy reach as recharging time is remarkably swift. The Proximans themselves have used Bees in most situations simply by employing enough of them to work in relays, but this is becoming rarer. We have been supplying the Proximans with an increasing number of Mules for these jobs as the latter are cheaper to manufacture than the more complex Bees. In return we have been purchasing their equipment for use in a number of areas such as the orbiting industrial regions round Jupiter where the high level of radiation makes conditions difficult for manned working ships.

The Alphans also operate a larger number of these machines, particularly in their mining operations near Barnards Star, and they can often be seen working in conjunction with the Alpha's Stag Beetle processors.

Although prototypes were being tested as early as 2042, Proxima's military shipbuilding programme was given priority in the years immediately preceding the war and no production line was established until after hostilities had ceased. Clearance was given to manufacture almost immediately as part of the Proximans' recovery programme, and the Bee made a significant contribution in terms of both export earnings and the redevelopment of domestic industries.

Specification - K34 Bee

Nationality	Proximan
Manufacturer	
Classification	General Purpose Service Craft
Main Drive	Photoelectric Plasma Drive 150,000 lbs. thrust
Personnel	1-2 or None (computer controlled)
Defense	Radiation Shielding Only

THE CITY SHIPS OF ALPHA

The first travelers to Alpha Centauri after the signing of the Trade Agreement in 2039 were scientific teams dispatched to work with their new colleagues in the exchange of knowledge which was to be so fruitful for both parties. Whereas the diplomatic missions had remained within the confines of Alpha's capital, Ergotha, the scientists were able to travel freely in the company of their opposite numbers. It was during their early explorations, made to familiarize themselves with the culture of their hosts. That they first saw what must stand as the greatest technological marvels of known space: the City Ships of Alpha.

It is impossible to convey the overwhelming impact that these extraordinary constructions have on those who have seen them first hand. Situated in the vast, bleak desert region of Alpha One, they dominate the horizon until the curvature of the surface hides them from view.

The Alphans themselves are uncertain of their exact age and origin as they have been there throughout recorded history and are shrouded in myth and legend.

Three of these megalithic structures exist and are obviously inhabited, but there has never been any communication with their occupants as far as the Alphans are aware. Attempts to communicate have always failed, while landings on their upper surfaces have proved impossible as a protective field diverts any object making an approach. It is believed that the citizens of these strange edifices have never participated in the evolution of other life-forms on the planet and have always remained within the perimeters of this otherwise lifeless region.

The most remarkable and almost inconceivable aspect of the cities is that they are capable of flight. Every few years one or more of them rises silently from the huge pedestal on which it rests and moves through the thin atmosphere to a similar stone column in another area of the desert. These columns are scattered throughout the district, though never less than a thousand miles apart, and there seems no reason why one should differ from another. The Alphan scientists have tried to identify a pattern in these movements, but no consistencies can be found either in the journeys of the cities or in the sites of the columns. One thing which is certain is that they represent a level of technological knowledge that we can only guess at. Their means of propulsion, for example, obviously depends on a gravity-resist process of some kind but how the enormous power this would require is generated cannot be explained. It seems to be a natural law that conversion of energy must always result in a by-product, whether heat, light or converted matter. The by-product from such a level of energy must be correspondingly great, but what it is or where it goes is another question. Seismographic surveys have established that the columns consist of solid masonry, while their temperature, with that of the air surrounding the City, fails to show any untoward variation.

Popular hypotheses abound; they are even, perhaps inevitably, regarded as the seats of deities and are the focus of a number of religious factions.

Another view widely held is that the inhabitants are the ancestors of the humanoid races and are now quietly observing the evolution of their progeny. Only time, and probably a great deal of it, will tell whether we shall eventually be allowed contact with whatever intelligence has shaped these objects.

Meanwhile they exist as awe inspiring enigmas that have a profound and somewhat humbling effect on all who see them. Not surprisingly, of the visitors who have made the journey to the desert, a great number return to contemplate the City Ships again.

3D Artwork based on an original work by Angus McKie.