

RAMA

Revision E, February 17, 1996

STORY AND OVERVIEW

- 1) When the player initializes the game, he will see a beautiful picture of the entire RAMA spacecraft against a background of stars. The word RAMA will also be in a prominent position. After a few seconds, a selection bar will appear on one side of the screen. The player may select Start a New Game, Load a Saved Game, Prologue, Tutorial, or Videos.
- 2) The Prologue begins with Arthur C. Clarke talking about the game. His main message will be that he hopes RAMA will have the same impact on the multimedia interactive entertainment world that 2001: A SPACE ODYSSEY had on motion pictures. After perhaps thirty seconds, while Arthur continues to narrate as voiceover, the screen will show highlights of the art, architecture, and creatures (humans, aliens, biots) from the game. The entire Prologue will be very slick, equivalent to a movie trailer, no more than two minutes in duration, and will conclude with a fifteen second video of Arthur.
- 3) The Tutorial will explain the game play elements, namely the use of the cursor, the map structure, the navigation process, the vidmail and data cube systems, the role of Puck, etc. The tutorial will also have interactive features. The player will thus perform a number of routine moves from the game before actually playing it for real.
- 4) If the player selects the Videos entry, he will be treated to a variety of supplementary information that will enhance his appreciation of the game. Included in this section of the product will be interviews with Arthur C. Clarke and Gentry Lee (about the game, the RAMA world, and science in general), some footage from the filming of the major video scenes in the game (including those in Sri Lanka), and a slideshow tour through some of the outstanding art included in RAMA.
- 5) If the first view after the player starts a new game, he will be sitting in the front seat of a small, two person shuttle spacecraft, looking forward through a transparent shield. As the bay doors of the Newton open (the Newton is hovering about ten kilometers away from RAMA-- shuttles are used to move people and cargo back and forth from the Newton to the hub site on the platform at the top of the nearly endless terraced stairway down to the Central Plain) to reveal a starry background, the player hears a narrator's voice over low music. The narrator explains, as the shuttle eases out into space, that a dozen astronauts, carefully selected by representatives of all the important institutions on Earth, have been sent to investigate a giant, enigmatic, cylindrical spacecraft that has suddenly arrived in our solar system from the depths of outer space. After the first sortie by the astronauts into the dark and hollow interior of the spaceship known as RAMA, mission commander Valeriy Borzov has died following an emergency appendectomy. Dr. David Brown, an American scientist whose specialty is exobiology, has now been named as the new mission commander. The player's instructions are to join the crew as a replacement astronaut.
- 6) The narrator reminds the player that the fundamental purpose of the mission is to discover as much as possible about this mysterious, alien spaceship. The narrator also explains that all the other astronauts, except for medical officer Nicole des Jardins, who is waiting at the hub site just

inside the shell of RAMA for the player's arrival, are currently establishing the infrastructure necessary to begin the scheduled exploration of the mammoth spacecraft. When the narrator's explanation is finished, the music swells, the tiny shuttle banks to the left, and the North end of RAMA comes into view. The theme music will accompany a leisurely flight along the length of RAMA (total time for this non-interactive introductory sequence is roughly two minutes-- it can be terminated at any time during its play by pressing any key), toward the south, where the airlock is located. RAMA grows and grows as the shuttle comes closer, until it fills the screen entirely. The shuttle descends on one end of RAMA, and then maneuvers through broad corridors before stopping in a parking hangar at one side of a large hub site. This site has been recently created by the astronauts on the ledge/platform just above the beginning of the seemingly endless, terraced stairway that descends to the Central Plain of RAMA.

7) The first action that the player can take is to move out of his shuttle. When the player leaves the shuttle, he immediately encounters Nicole des Jardins. First she hands the player the ~~key~~ **key** to his ~~locker~~ and shows him with gestures where it is located at the hub site. Then, in a friendly, fairly long non-interactive sequence that contains a lot of solid advice, Nicole talks about the progress of the expedition, the vidmail system, the data cubes, the lockers, the thigh computer that is a part of each astronaut's uniform, and some of the other equipment at the hub site. After suggesting that the player take his time, explore the hub site, find his ~~backpack~~ **backpack** in his locker, look at messages for him that are stored in the hub site computer, and then join his colleagues down on the floor of RAMA, Nicole walks across the field of view to an enclosed cable car that quickly descends out of view. The player is thus left alone and has free will for the first time in the game.

8) What can the player do at this hub site at the South Pole of RAMA? First, he can check out his backpack, including viewing all the inventory items therein, some of which will be helpful during the course of the game. Secondly, and most importantly, the player can activate the computer, where he will find personalized vidmail messages recorded for him from most of the other members of the crew, as well as individual written dossiers on his fellow astronauts. There are vidmail messages from journalists Francesca Sabatini and Reggie Wilson, the two principal scientists Dr. David Brown and Shigeru Takagishi, military officers Michael O'Toole and Otto Heilmann, and professional astronauts Richard Wakefield, Irina Turgenyev, and Nicole des Jardins. The two other members of the crew, Janos Tabori and Hiro Yamanaka, never appear in the game, they do not send a message to the player, and their individual dossiers are censored and marked CLASSIFIED when the player tries to read them. In reality, Tabori and Yamanaka are the weapons specialists who, following Heilmann's instructions, deploy the nuclear bombs in the game.

9) The gameplay at the hub site begins with the reading of the vidmail messages. The cable car reappears after Richard Wakefield's message has been read; the code to cause the cable car to descend to the Central Plain with the player is contained in Michael O'Toole's vidmail. Once these two events have occurred, the player receives from Francesca Sabatini his first real time vidmail of the game. These real time vidmails, which happen at several places in the game, override whatever the player is doing with an interrupt. They are then automatically stored on the player's computer. In this first vidmail, Ms. Sabatini tells the player that Nicole has informed them all of his arrival, welcomes him again, and asks him if he will please retrieve her ~~cigarette lighter~~ **cigarette lighter** from her locker and bring it to her on the Central Plain. She laughingly tells him that she has misplaced her backup ~~key chain~~ **key chain**, on which she kept her ~~locker key~~ **locker key**, but since the hub site is small, the player shouldn't ~~have much trouble finding it~~ **have much trouble finding it** ? Francesca adds that there are some interesting ~~artifacts~~ **artifacts** from inside RAMA also in her locker, as well as a couple of data cubes of her recent television broadcasts back to Earth. She concludes the vidmail by asking the player to leave her lighter somewhere in

the tent site at the bottom of the cable car ride-- where she promises to leave him some more data cubes of interest, one containing her profiles of all the player's fellow astronauts.

10) All the introductory vidmails at the hub site are essentially short self-portraits of the other astronauts. Nicole's is the longest. Half French and half African (from the Senoufo tribe in the Ivory Coast), a former Olympic champion in the triple jump, the thirtyish chief medical officer is a warm human being, concerned about the welfare of the replacement cosmonaut. She is solicitous without being condescending, offers help both in the present and the future, and makes suggestions that will be useful to the player. Nicole is the primary other character in the game and will become the player's best friend.

11) Richard Wakefield is in his early thirties and is a genius electronics engineer from England. Richard is also a Shakespearean devotee whose primary avocation is creating tiny robots, about as tall as a pencil is long, based on his favorite characters from Shakespeare. In his introductory vidmail he quickly strays from a discussion of the mission to a general welcome to a demonstration of the capability of his little robots. He shows how Falstaff can walk and talk on his own and then Richard tells the player that he has left another robot, Puck, from A MIDSUMMER NIGHT'S DREAM, as a gift for the player. Richard laughingly then hollers for Puck and his voice activates the little character, who is in Richard's locker. Puck opens the locker from the inside, and then, after introducing himself and telling the player he is going to stay permanently in his pocket, Puck flies toward the player and disappears. Puck is never seen again in the game, but it is his English voice that is heard often, sometimes as a result of an event trigger (explaining something that may not be all that apparent to the player), and sometimes as a result of a flag trigger that indicates the player may be floundering. There will be an option available in the game for the player to have Puck turned off permanently.

12) Francesca Sabatini is the other astronaut whose raw intelligence classifies her as a genius. Francesca, a world famous Italian television journalist at the tender age of twenty-nine, uses her considerable sexual attraction (she's a formal model and actress) to manipulate everyone she encounters, male or female. There is a sexual overtone to all her comments to the player in her introductory vidmail. She explains to the player that her primary job is to report on the mission to investigate RAMA, and that she is hoping for an early opportunity to introduce the new astronaut to the millions on the Earth who are following her daily reports.

13) Dr. David Brown, late forties, balding, bespectacled American, is a world famous scientist (as is Dr. Shigeru Takagishi from Japan) more because of his self-promotion and opportunism than his actual talent. He has become commander of the mission following the unfortunate death of Valeriy Borzov. Ruthlessly ambitious, Brown has made a deal with Francesca (sealed with sex and money) to guarantee that he is viewed as the hero of the RAMA mission. His tone in his vidmail is imperious, he obviously thinks he is really the cat's meow, and he makes it clear that he expects the player to follow his commands.

14) Dr. Takagishi is a brilliant, self-effacing scientist, early fifties, shorter even than the average Japanese person, who is extremely orderly in everything he does. He speaks only rarely, but when he does, he communicates a lot. In his first vidmail he speaks passionately about what it will mean for all humanity if the astronauts encounter extraterrestrial life forms in RAMA. His eyes sparkling with enthusiasm and anticipation, Dr. Takagishi clearly cannot imagine a more wonderful assignment than being part of this mission.

15) Reggie Wilson, early thirties, athletic, black American, is the other journalist. He is a newspaper/magazine reporter who has been completely upstaged and suborned by Francesca, his former lover who no longer sleeps with Reggie since he can't help her anymore. Reggie does not like the fact that Dr. Brown is in charge of the mission, and says so in his vidmail introduction. Reggie's general tone is cynical, and he already suspects that RAMA is malevolent.

16) General Michael O'Toole, avuncular, paunchy, Irish-American from Boston, in his early sixties, is the father figure on the astronaut team. A former general on an international peacekeeping team, O'Toole, whose training is military, is also deeply religious (a Roman Catholic), extremely moral, and fascinated by mathematics. In his introductory vidmail he muses about the religious significance of creatures so much more advanced than we are (a theme introduced and amplified in his up close and personal interview with Francesca), and then tells the player about his fascination with the number 41. One of O'Toole's design responsibilities was the codes on the Newton project, and he tells the player that 4143, which is the first two numbers of the quadratic prime sequence starting with 41, is the code to activate the cable car.

17) Otto Heilmann is the quintessential German general or banker in appearance. Middle fifties, almost fat, ruddy cheeks, Otto is smoking a cigar during his brief introduction to the player. Admiral Heilmann is in charge of security, and he reminds the player that there is likely to be considerable danger involved in the mission. He mentions that two other individuals, Yamanaka and Tabori, work for him and the player may encounter them from time to time during his work.

18) Irina Turgenyev is a Ukrainian civil servant, from Kiev. She is dour, squat, unpretty, in her early forties. Irina is also humorless and drab. She distrusts everything, has doubts about what RAMA is up to in the first place, and following Borzov's mysterious death, Irina believes that RAMA's coming may be the end of life as we know it. Irina represents all those people who think that extraterrestrials will eventually invade and destroy the Earth.

19) After the player has read all the introductory vidmail messages (or just those that allow him to continue to play the game-- the player can return to the hub site whenever he wants in the game and access the introductory vidmails and the dossiers), and heard directly from Ms. Sabatini, he will most likely, if he has not already, explore the remaining locations at the hub site. That will take the player down the terraced stairway and into RAMA itself. The hollow interior of the great spaceship is dark, and the player's ~~portable flashlight~~ will allow him to see only three or four steps below him. The player will be permitted to gain a sense of the stairway by moving along it in either direction two or three giant paces, or by descending to the first platform, perhaps twenty steps down. However, his colleagues will have previously built a fence at the limits of these excursions. What will the player do in this stairway area, except look and wonder? On the landing below him, off to one side, the player will encounter a ~~nuclear bomb~~ the size of a small desk. The bomb will have the stenciled markings of the International Nuclear Agency on its side. Also on the side of the bomb will be a place to input a 20-digit code, in addition to a small monitor with the red letters INACTIVE on its front. Examining the landing and the stairway in more detail, the player will find Francesca's key chain. On that chain will be not only the key to Francesca's locker, but the key to Otto Heilmann's locker as well.

20A) When the player climbs back up the stairway to the hub site, he will almost certainly open Francesca's locker. The cigarette lighter, two data cubes, ~~one critical puzzle piece~~ (one of the two necessary to complete the matrix that originally controls the lock to the second level of London), and several other items, both personal and game-related, will be found in Francesca's locker. If the

player chooses to open Otto's locker, he will find two items of consequence: first, **one of the three** ~~is~~ from the instrument in the Wheel Region (to be discussed later) and a data cube whose identifying code separates it generically from the other two the player has found. Placing this data cube into his own reader, the player sees that it is a memo from Otto Heilmann to Tabori, Yamanaka, and O'Toole. Brown's name has been added to the list of people to receive the memo; O'Toole's name has been crossed out. The indicated subject of the memo is "Trinity". The body of the memo, however, is completely unintelligible, having been encrypted in a polyglot code.

20B) Throughout the game, the player will be encountering data cubes that he will pick up and insert into his computer to view. The data from these cubes, once read, will be stored and indexed in the astronaut's computer. The cubes will then disappear from the inventory list. The military contingent on the team, however, headed by Otto Heilmann, have special data cubes, which can only be accessed in one of the standard computers if a **decryption card** is added. The cube reader on the computer will print the memos from these special data cubes in their encrypted form unless a decryption card has been installed. The two data cubes Francesca left in her locker for the player, however, can be easily read whenever the player would like. On the first cube are two up close and personal interviews conducted by Francesca, one with Dr. David Brown (when he was only Chief Scientist of the mission-- the interview was done on the Earth, before the Newton left, just at the beginning of the affair between Francesca and Dr. Brown. She is personal and familiar and allows him to be self-aggrandizing in his responses) and the second with Michael O'Toole, with whom she discusses the religious implications of RAMA as well as General O'Toole's recent conversations with the Pope. The second cube contains Francesca's broadcast back to Earth right after the Newton touched down on the end of RAMA, and includes an interview with Dr. Takagishi, the leading expert on the visit of the first RAMA seventy-five years before, about what is to be expected once the airlock is open.

20C) The player may or may not open Francesca or Otto's locker. Eventually, of course, the main flow of the story at this point, involves the player climbing into the cable car and descending to the Central Plain. The cable car that will transport the player will not show up until after Richard Wakefield's vidmail has been read and Puck has been obtained. To activate the car controls, the player must input the 4143 code into the desired spot on the cable car dash. This code is learned, as mentioned earlier, from listening to General O'Toole's vidmail. The player can go down to the tent site without opening Francesca's locker and retrieving her cigarette lighter; however, if the player leaves the tent, and heads into the Central Plain having never found her key and opened her locker, Francesca accosts him immediately, asks the player if he brought the lighter, tells him how very busy she is, and then requests that he go back and get it. If the player **STILL** does not go back to the hub site to her locker, he will not be able to enter the second level of London without a **card**.

21) In general, the player will be allowed to loiter at the hub site on the rim. Once he has read the two critical vidmails, however, and opened both of the lockers, a flag will be set in the game such that after another few moves the player will receive a real time vidmail from Nicole. She will talk about some object she has found on the Central Plain, and suggest that the player join his colleagues. After another suitable number of moves, if the player has still not decided to enter the cable car, Dr. David Brown will call the player to the Central Plain with what is very much a direct order.

22) The first cable car descent will be a non-interactive movie. Sound effects and the motion of the car back and forth will give the player the sense that he is descending. About halfway through

the twenty second descent, dawn will come to RAMA. It will be spectacular. Lights will first illuminate the opposite end of the cylinder, the north end, where the Big Horn and its supporting structure looms. Slowly the lights will move south across the alien world, showing everything in perspective. The entire inside of RAMA will be lit for no more than ten seconds, and then dark will move across the cylinder in the same fashion, starting at the Northern end. Just before the player reaches the tent site, the lights will come on again, everywhere in RAMA. They will stay on from that point forward in the game. Later, if the player chooses to return to the base on the rim, his ride time, both going up and then returning to the Central Plain, will take only a moment and he will not have any kind of view.

23A) After the player emerges from the cable car at the bottom of his ride, he will be inside the solitary large tent that serves as a shelter and/or camp for the area. None of the other astronauts are in the tent when the player first reaches the bottom. Inside the tent are several pieces of equipment, including a large specimen tray, a refrigerator, and a rack where data cubes are stored. There are already a few objects in both the specimen tray and the fridge (as well as the data cubes that Francesca promised), and during the game these will expand and change. The experienced game player will return to the tent site from time to time to find out what new puzzle pieces and/or data cubes have been left there by the other astronauts. The tray and the fridge represent "safe" places where the player can store items, away from the crab biots.

23B) The two data cubes left in the tent site by Francesca are also of the standard variety. Each contains a single telecast done by Francesca. In the first, which was recorded on the Earth with the astronauts out of uniform, she does an introductory profile of the whole astronaut crew. She is sitting in her studio, or some other venue, describing each of the astronaut's attributes, and then cutting to prerecorded segments with different astronauts commenting or answering a specific question. This data cube's content gives the player another look at his colleagues. The second cube in the tent site was recorded only a few hours before the player arrived on RAMA. Francesca, reporting on the death of Borzov, grills Nicole, the mission's chief medical officer, on what happened during the emergency appendectomy. Her adversarial questioning is in direct contrast to her almost fawning interview of Brown the previous day. It is apparent that there is serious feminine competition between Francesca and Nicole. The concluding part of the telecast is a three way discussion involving Francesca, Richard Wakefield, and Irina Turgenyev about the nature of RAMA. Irina asserts that the mysterious death of Borzov is another indication of the malevolence of RAMA; Richard takes a detached, Spock-like logical position in his interpretation of what has happened in the mission thus far.

24) While the player is in the tent for the first time, before he crosses to the Central Plain, Irina will suddenly show up to fetch a heavy cable. She will explain to the player that an unusual creature has been sighted that looks like a crab, and that Dr. Brown has ordered the crew to capture it. Irina will exhibit both fear and disgust, muttering to the player that she believes this place is dangerous. She will then leave quickly. After Irina has departed, the player will receive a vidmail from Brown that includes a photograph of a crab biot. Brown will ask the player to explore RAMA on his own, explaining that most of the rest of the crew will be engaged in the crab biot hunt for the next several hours. If the player has not visited Francesca's locker at the hub site, then the vidmail from Brown will not come until after the player has met her directly outside of the tent site.

25) When the player decides to exit from the tent, he will have one spot, just outside the tent, where he will still have a first person view in all directions to see the wonders of RAMA.

Movement in any direction from that spot will cause the transition from the first person point of view to the third person navigation view. The camera will slowly zoom away, keeping the player (in an astronaut uniform, seen from the back) in the center of the field of view. At some point in the outward zoom the rendered astronaut will morph into the symbol for the player that will be used in the rest of the game.

26) At this point the player is symbolically represented on a three dimensional map that includes the base camp at the foot of the cable car. This navigation map is just one small part of the larger map (called the overview map) of the Southern Hemicylinder. The convention that will be used in the game is that any area into which the player goes becomes illuminated on the map. As mentioned earlier, at the beginning of the game only about ten percent of the territory of the Southern Hemicylinder can be seen. As the player moves around, and explores, that which he has seen becomes permanently lit on the map. The unexplored portions remain marked with black on the map.

Nav
Map

27) So what does the player do after he reaches the Central Plain at the bottom of the cable car? Where does he go? How does he manage his exploration? There are many things that the player can do on the Central Plain of the Southern Hemicylinder. He has the ability to move to other positions (pixels on the symbolic map) in any allowed direction. Barriers that cannot be crossed are indicated by symbolic convention. Any unusual features, or objects that can be added to inventory, or puzzles, or human beings, or biots are indicated with symbolic representations on the map. Biots and other moving beings, like the other astronauts, move according to a time dependent function programmed in the game. Thus biots may move in and out of the game frame while a player is standing still. One of the major activities of the player during this phase of the game is to wander around on the navigation map, gathering the occasional puzzle piece, and have more of the game territory lit up and understood. By simply exploring, the player will eventually create an illuminated map of all the open area in the Southern Hemicylinder.

Nav
Map

28) The macrostructure of the early game flow is straightforward. Out on the Central Plain are five areas where the player can make the transition from wandering on the navigation map to playing a first person game. The break away from the navigation map occurs only if the player finds/reaches the entrance to one of these five areas, or happens to encounter another astronaut or biot on the navigation map schematic. Exploring the Central Plain, the player will find that he must pass through the Beam Region to reach London, and through the Wheel Region to reach Bangkok. The fifth region in the Central Plain is called the Iceport. It can only be reached by moving around the perimeter of Bangkok or London, to spots one hundred and eighty degrees away from the entrances to the structures, and then taking the only available path away from the city. These two paths merge into one just outside the Iceport entrance. Dr. Brown, in his initial vidmail, will have given the player instructions that point him toward the Beam Region first (through which he must go to find London), but the player could actually go initially to either of the two outer regions. Bangkok can be explored before London without any gameplay problems.

29) The player's overall goal in the Central Plain is to explore everywhere, solve most (if not all) the puzzles, pay attention to the unfolding plot, eventually find and gain entrance to the Iceport, and then cross the frozen Cylindrical Sea to the island city of New York and its mysterious skyscrapers. To pass through the gates of New York, the player must have the ~~critical inventory~~ ~~medallion~~, which is earned on the third level of London. This medallion has four items on its face-- ~~the human lair talisman, the octospider lair talisman, an avian ring, and a wild card,~~ all of which

must be gathered by the player before the inventory medallion will become fully illuminated. This illuminated medallion is the key that will open the gates of New York.

30) Once the inventory medallion is in the player's possession, it automatically and continuously polls the rest of the inventory, lighting itself to show which critical items have already been accumulated by the player. If the player drops one of the critical items in the inventory, or uses his only wild card, then those portions of the medallion are no longer lit. Although there is nothing on the medallion that states specifically what it is, it is decorated on the back with the gate to New York and a silhouette of the skyscrapers to suggest its importance.

31) Nobody is allowed to enter the Iceport until he has the fully illuminated inventory medallion in his possession. If a player draws near to the Iceport at an earlier juncture in the game, then he is stopped by a direct encounter with security chief Otto Heilmann, who tells the player to turn back. If the player persists, and continues even one more step toward the Iceport, then he receives a vidmail from an angry Dr. Brown. Brown tells the player that he is to obey Heilmann's dictum. He also says that insubordination is grounds for dismissal. One more bad step and the player is fired from the astronaut crew. The Iceport represents a logical nexus in the RAMA game. Although the paths to reach that point in the game may be quite varied, everyone must eventually move through the Iceport, across the frozen Cylindrical Sea, and up to the gates of New York with the inventory medallion. Once the player has crossed the sea, he cannot return to the Iceport and the rest of the Southern Hemicylinder.

32) There are two different ways to look at the Central Plain portion of RAMA. It can be viewed from the point of view of the plot in the evolving, underlying story, or from a gameplay perspective. In general, gameplay on the Central Plain involves two activities: A) solving puzzles created by the Ramans to screen the creatures who have entered their domain, and B) learning clues about the Raman world that will be helpful once the player reaches New York. The fundamental activity on the Central Plain (although the player will not know this except by inference) is the gathering of the inventory medallion and the four items designated thereon. The two talismen are found in the city of Bangkok, the avian ring in the Wheel Region, and the wild card inside the Trash Pit in London, or in one of the outer regions of the Central Plain. The medallion itself, as mentioned earlier, may be found on the third level of London. None of these critical items can be gathered as the result of a single step process. Each is part of a larger puzzle scenario, the logic of which was established by the Ramans themselves.

33) The plot is interleaved with the gameplay. Various twists in the plot are triggered by the player's having achieved a particular milestone in the play of the game. For example, whenever the player has in his inventory two of the four items on the inventory medallion (whether or not he has the medallion itself), or he has entered (and come out of) BOTH London and Bangkok, then the moment the player enters the Central Plain from one of the cities, he encounters Nicole des Jardins. She is obviously very distressed. Nicole tells the player that she has some bad news. She has personally come to tell the player because she thought vidmail would be too impersonal a way to inform him of the death of Reggie Wilson. Nicole, apologizing for her lack of time, quickly departs after giving the player a data cube containing Francesca's news broadcast following Reggie's death. This newscast not only includes the harrowing clips of the crab biots chopping Reggie and the rover into small pieces, but also features a short debate on the nature of RAMA (between Irina and the gentle Takagishi, with Francesca as interlocuter. Takagishi had opposed the crab biot hunt in the first place). Richard jumps into the debate at the end, without being asked, with a few arrogant comments of his own.

34) Similarly, having entered and departed from each of the two outer regions sets another flag in the game. Once that flag is set, the next time the player enters the Wheel Region, an avian (the first real extraterrestrial that has been seen in the game) flies over his head in the direction of the giant biot ruin. When first visited by the player, he had an idea that some energy (lights and discharge, for example) still remained in the ruin. After the trigger event, when the player returns, that avian indicated earlier is now trapped in the ruin and the player must help rescue it. The grateful avian will then give the player one of its neck rings, one of the items on the inventory medallion. Failure to help the avian will mean that the player does not earn the ring icon on the medallion-- the Ramans do not want to allow entry into New York by a member of a species that will not help another species in trouble. If the player does not help the avian the first time, the avian will remain in the same place, with the same behavior, for the rest of the game.

35) The first time that the player sets foot outside London or Bangkok with three of the four inventory medallion items in his possession, RAMA undergoes a trajectory correction maneuver that is seen (and heard) in the game as a Ramaquake lasting six to eight seconds. Immediately afterwards the player's vidmail lights up. Irina reasserts that she is terrified, Nicole inquires about the player's health, and Richard guesses, correctly, what has happened. Twenty moves later by the player (but in no case later than when the player possesses all the inventory medallion items plus the medallion itself), he receives a very important vidmail from Dr. Brown. This long vidmail announces that Earth has confirmed the RAMA maneuver, that RAMA is now on an impact course with the Earth, and that there is a discussion underway at ISA headquarters about abandoning the expedition altogether. Dr. Brown also announces that Francesca, Takagishi, and Michael O'Toole are off to get a glimpse of the city of New York and that a data cube with Francesca's full report on the trajectory correction maneuver is now available at both the tent and the iceport.

36) If the player has the fully illuminated inventory medallion, and is continuing to wander around the Central Plain, then after some specified number of moves the player receives a vidmail from Nicole asking him to come to the Iceport. There he is met in person by Dr. David Brown, who reports two new and very significant pieces of information: A) that mission control on the Earth has ordered the astronauts to leave RAMA, and B) that the crew has lost touch with the three people (O'Toole, Sabatini, and Takagishi) who went off to investigate New York. Brown is barely finished speaking when Nicole walks up. She recommends that she and the player take a quick trip in an icemobile over to New York to see if they can figure out what might have happened to the three others. Brown assents, gives the player a data cube containing the file of vidmail transmissions he has received from the lost astronauts (one each from Francesca, O'Toole, and Takagishi-- Francesca's is outside the open gate, O'Toole is puzzling over the maze controller, and Takagishi is already in the octospider lair) during the last several hours, and leaves to look after the rest of the crew. Nicole follows Dr. Brown, telling the player to look around the Iceport, that she will be back in a few minutes.

37) Leaving the player by himself for the first time in the Iceport, with the inventory medallion in his possession, it is worthwhile now to turn back to the Central Plain gameplay, and understand how the player arrived finally at the Iceport. A lot of gameplay, measured in terms of hours even for the most skilled gamers, will have passed before the player reaches the Iceport. What will the player have been doing while he was acquiring the objects on the inventory medallion and triggering all the plot twists that have been described above? He will have been exploring all the geographical entities, of course, but it is difficult to explain the gameplay by focusing on geography because of the nature of the puzzles. It makes more sense to define briefly what objects

are located where in the Central Plain, and then discuss how the player obtains his inventory medallion and the items marked thereon in terms of the puzzle sets and their relationships.

38) The Beam Region contains the transparent, paraffin-like cube inside of which is a wild card, the biot hanger, a trash biot, and the large beam. In the Wheel Region are the wheel puzzle, the giant ruined biot, a trash biot, a still, the corn field, and the puzzling partial instrument on the top of a large mound. Both London and Bangkok are complex cities with three separate levels, since the Ramans always do everything in threes. London's levels involve movement of the player toward the center of the city. Each level is surrounded by the previous ones. The inventory medallion can be earned in the third and final level of London. In Bangkok, the levels are tiers-- the player ascends from tier to tier in an elevator. London was built by the Ramans to explain the geography and function of the RAMA spaceship, including the biots placed onboard by the builders. It does not have to be changed each time RAMA is deployed to another sector of the galaxy.

39) Bangkok is refurbished for each specific flight profile, and is tailored to the needs of the species that RAMA expects to encounter on that particular mission. In particular, each of the three species onboard in this game, namely the humans, the octospiders, and the symbiotic combination of sessiles and avians, can learn something about the nature of the other passenger species by studying what is in Bangkok. Learning the number systems of the octospiders, the avians, and the sessiles is essential to being successful in the RAMA game. Playing through Bangkok and obtaining the two key talismen on the inventory medallion will demand that the player become familiar with these alien numbering systems. Later in the game, in the lairs underneath New York, this knowledge of alien numbers will again be important.

40) The most important overriding puzzles in the Central Plain section of RAMA are the progressive matrices. A progressive matrix is a three by three array of pictures that displays discernible evolving patterns in their elements going both across and up and down. The Ramans, knowing that progressive matrices are excellent, non-cultural ways to assess intelligence, have placed progressive matrix puzzles to control the locks on the doors to each of the six parts (three in each of London and Bangkok) of the cities of the Central Plain. In each city, the outermost lock has one empty element in its matrix puzzle, while both the middle and innermost locks have two empty elements. The player must understand the pattern in the pictures on the matrix and insert the proper puzzle piece(s) in the empty slots to open the doors and proceed to the next level.

41) Matrix puzzle pieces, thirty altogether, are scattered throughout the Southern Hemicylinder. A couple were at the hub site, one or two more were placed at the tent site (and others may appear in the tent specimen tray as the game progresses), many are dispersed throughout the first person outer regions, a couple are carried around by centipede biots, a few are in locations on the third person map in the Central Plain, and several can be found in the different parts of Bangkok and London. Each puzzle piece that the player encounters is a CANDIDATE for one of the empty elements in a matrix controlling the locks. The player will not be able to proceed by trial and error, however, because of the way the Ramans change the matrices after mistakes are made in the insertion of puzzle pieces. There are six matrix puzzles altogether in the game, but which lock they control may be changed if the player tries to insert improper matrix pieces. Two improper attempts at any given matrix trigger a rotation in the six matrix puzzles. By looking at the matrix governing the lock, the player should be able to read the patterns moving left to right, and down the columns. From that information, he should be able to identify the unique puzzle piece that fits each particular empty element slot.

42) Adding another level of challenge to the gameplay in the Central Plain is the trash system. When the player sees a trash biot for the first time (either in the Beam Region or the Wheel Region), he encounters Reggie Wilson, who is in a hurry but stops for a few seconds to explain what he has learned about the trash system of RAMA. Reggie also laughs about the progress (or lack thereof) in the attempts of the astronaut crew to capture one of the crab biots, who are an integral part of that trash collection. As Reggie leaves, he hands the player a data cube that he has compiled containing a non-interactive sequence of the crab biots picking up garbage on the Central Plain and bringing it to one of the trash biots.

43) The crab biots are a very important element in the game. These fearsome biological robots, creations of the intelligence that runs the gigantic cylindrical spaceship, are the garbage collectors of RAMA. They move in gaggles of six, in bowling pin formation, out on the Central Plain, picking up anything they encounter as they wander around the terrain. These creatures are dangerous. If the player stands in front of them while they are moving, he will die. The crab biots pick up stuff, grind it and tear it with their mouth equipment (although they can do no damage to Raman items, such as matrix puzzle pieces), and then carry it to one of the two trash biots. In front of the two trash biots are trash bins. Periodically, the two trash biots empty these bins into a large underground system that carries the pieces of garbage to the trash pit in the second level of London.

44) What is important here, from a game play point of view, is the idea that any inventory item left in an exposed location on the Central Plain will eventually end up in one of the trash biot bins or the trash pit itself. At the beginning of the game, the crab biots have already taken some of the key puzzle pieces in the game and placed them in the trash. The player must retrieve them from the trash pit in London. Sometimes in the game, puzzle pieces will be in the trash bins. An internal algorithm will track the progress of each game item, according to a set of predefined rules, from crab biot, to trash bin, to the trash pit.

45) It is difficult to reclaim a puzzle piece from the trash pit. As it moves through the dirty underground system, it collects green gunk. The player can find each piece in the trash pit, covered in green gunk, by entering the second level of London and then riding the elevator down to the pit. To figure out how to activate the elevator, the player must observe a mantis biot in action. By the way, pieces covered by gunk cannot be used in the game until they are cleaned. They can, however, be recognized in their gunky state. So the player can choose which pieces he wishes to clean. He must also figure out that it is necessary to clean the pieces using the solvent from the still, which is located in the Wheel Region. Eventually, if the player is patient and careful, he can find any matrix piece he has seen before and discarded, clean it properly, and use it for its originally intended purpose. To avoid that time-consuming process with respect to the progressive matrix pieces, the game offers the player a single alternative: the wild card.

46) A wild card can be used to substitute for ANY individual progressive matrix puzzle piece. There are three wild cards altogether, one of which must be retained by the player so that the inventory medallion can be fully illuminated. The other two, if obtained, can be used either to obviate cleaning a gunky puzzle piece, or to fill in an empty matrix element when the player simply cannot discern the patterns in the matrix. How does the player obtain a wild card? Not easily. He can earn each of the three wild cards by solving a different multistep puzzle. One of the wild cards is on a ledge in the center of the wheel puzzle. That ledge can only be reached by the player if he first solves the problem of entering the center of the wheel puzzle and then chooses, for his ladder,

a fence restraining a deadly spider biot over in the biot hangar. Another wild card piece is embedded in the paraffin-like cube in the Beam Region. To be able to reach it, the player must assemble all the elements of the instrument in the Wheel Region, and then operate it like a laser, burning the paraffin-like substance away and making the wild card accessible. The third wild card is covered with green gunk and hidden in an alcove off to the side of the trash pit. To use this wild card, the player must discover the alcove in the first place, and then figure out the cleaning process discussed above.

47) So what is in the cities of Bangkok and London? As mentioned earlier, the Ramans created London to help the alien species who enter their ship understand what RAMA, and its biots, are all about. Bangkok is a treasure trove of information about each of the three species that are onboard this particular RAMA flight. Bangkok and London each have three different levels, and the player gains the ability to move from one level to another by inserting matrix puzzle pieces in a progressive matrix. But there the similarities end. Inside London the player learns in detail about this RAMA worldlet he has entered. On the first level, he can gather up scattered pieces (there are six pieces per map, a few of which are OUTSIDE London) that will allow him to assemble maps of the Central Plain and New York, thereby giving himself an overview of the surface level geography of the game. The middle level of London contains the trash pit for the game. In the inner sanctum the player views exhibits depicting the entire menagerie of Raman biots, and also comes face to face, for the first time, with a live, and deadly spider biot who is guarding the inventory medallion. The spider biot can be neutralized in the game only by a crane biot activated by a laser beam. The player learns this in the third level of London, but the crane biot activation mechanism in London is fixed on a mounting. The player must solve a puzzle to reach the mounted laser, after which the spider biot is neutralized and the player may obtain the inventory medallion.

48) The primary puzzle activity in Bangkok involves learning machines created by the Ramans to teach the numbering systems of the species that are currently inhabiting RAMA. In the anteroom of each tier there are three of these machines, each oriented toward a specific task. One machine focuses on Repetition, another on Recognition, and the third on Manipulation. Iconography on the machine shows that it automatically recognizes which species is using the machine, suggesting that each machine really has the capability of testing any of the three species. A three-sided keyboard rotates to make itself available for the kind of species poised to use the learning machine. For example, when the player walks up to the first machine, the icon for octospiders is lit, and the keyboard is full of octo colors. Two seconds after the player is in position to use the machine, the keyboard rotates, the lit icon changes to a human, and the first numbers appear on the screen. Success on these learning machines allows the player to have a chance to explore a higher tier in Bangkok. Success at the entire suite of learning machines yields the two inventory medallion elements, the human and octospider lair talismen, that are needed to open the gates of New York.

49) Each tier in Bangkok features one of the three passenger species onboard. Each tier also contains, in addition to the learning machines, a museum of natural history that explains more about the species being featured on that tier. The lowest tier is about human beings. Playing the learning machines there will be easy, for the numbers being repeated, recognized, and manipulated are human. What is being established in the lowest tier are the paradigms that will be used throughout all of Bangkok, most specifically the kinds of information that appears in the museums, the flow of the tasks on the learning machines, and other similar characteristics. Thus, when the player moves to the second tier of Bangkok, which not only contains learning machines with myrmecat and avian numbers, but also depicts the avian-sessile-myrmecat symbiosis in its museum,

he will need to remember the process that he used to be successful in the lower tier. After finishing the repetition phase of the learning tasks, the player is rewarded with a key to that tier's museum of natural history. Upon completion of the recognition task on the first tier, the player earns the Bangkok elevator key. On the middle tier, success at the recognition task produces the human lair talisman on the inventory medallion; on the upper tier, a similar success yields the octospider lair talisman.

50) It is not essential that the player finish the manipulation tasks of the learning machines to move forward in the game. Manipulation of alien numbers will be a challenging endeavor. In a sense, the game design provides extra credit to the player who has the desire and the assiduity to complete the manipulation tasks in each of the three tiers. The rewards for finishing the manipulation tasks are significant-- the player will receive the jewels which, when combined, will allow the player to obtain the Rosetta Stone, a plate relating all the alien numbering systems in RAMA on one object. The Rosetta Stone will be very valuable in the later play of the game.

51) While playing the nonlinear game in the Central Plain, the player will have occasional encounters with either other astronauts or biots. On the navigation map, these other characters will be represented as icons in that third person view. From a classification point of view, these encounters fall into three categories-- A) Predetermined encounters with humans (that is, they are triggered by game events and happen without any choices by the player); B) optional encounters with humans (they may or may not occur); and C) possible encounters with biots. While he is wandering on the navigation map, the player will occasionally see the icons for the crab, centipede, and spider biots. The crab biots follow a set pattern, ignoring the player altogether, and can be easily avoided. The player may safely view them from the side (when the game switches to a first person view), but will be killed if he stands in front of their phalanx. The centipede biots can be viewed from any angle without danger, and two of them will be carrying puzzle pieces which will become available to the player after an encounter. The spider biot, however, once loosed from its enclosure in the biot hangar, actively seeks out the player. The player must take evasive action or he will end up a casualty. There will even be some event triggers that will cause the spider biots to suddenly appear in a frightening first person sequence in one of the outer regions.

52) Predetermined encounters with humans will occur after specific game triggers. Four encounters of this type will occur while the player is on the Central Plain. The Reggie Wilson encounter, for example, where he explains the trash system, belongs in this category. Similarly, the player will meet Shigeru Takagishi on the road between the Beam Region and London, just before the ray barrier, and Francesca Sabatini the second time that he stands in front of the Wheel Puzzle. Takagishi will tell the player what he has learned about passing the ray barrier and making it to the outside gates of London. Francesca will give the player Otto Heilmann's special decryption card and ask the player to take it back to the tent site and leave it on the table. Otto's decryption card is a very important asset for the player. With it installed into his computer, he can read the encrypted code on those memoranda that originate with Otto, including both the memo contained in the data cube that was found in Otto's locker, and those that are in the pocket of Francesca's spacesuit encountered much later in the game, in the octospider lair. The final predetermined encounter will be with Nicole des Jardins, but will only occur if the player is floundering around and having trouble making progress in the game. In that case (based on some quantitative measure in the game), Nicole will show up near the biot hangar and hand a puzzle piece to the player, explaining that she found it somewhere and thought the player might want to put it with his other discoveries.

- 53) Four other human encounters will occur only if the player purposely moves his icon on the navigation map into a position where he is next to an astronaut icon. This allows the player some free will in the game. In one of these possible encounters, Richard Wakefield will hand the player the optical ray instrument convex lens, saying it might be useful in his explorations. In another, not far from the Iceport, the player will hear a grumpy monologue from Otto Heilmann complaining about how both the people on the Earth and even the other astronauts don't seem to be able to grasp how dangerous RAMA might be. A third encounter is with the effervescent Francesca, who has just finished taping the "What is RAMA?" interviews with O'Toole, Wakefield, and des Jardins, and hands the player a data cube showing that interchange. In this video sequence Richard explains the possible logic and purpose for the Raman puzzles. The final possible navigation map encounter is with Nicole, who is concerned about the new astronaut's welfare and offers him both friendly encouragement and advice.
- 54) There are several situations during the Central Plain portion of the game in which the player may die. Whenever a player death occurs in RAMA, the program will enter one of three standard non-interactive death sequences, in all of which Arthur will offer some encouraging advice based upon how much progress the player made before his death. Which death sequence is triggered will depend upon how the player has died. If a spider biot killed the player, then a specific spider biot death sequence will be shown. If it is late in the game and the player has been killed by the explosion of the nuclear bomb, then the specific sequence in which Arthur talks about nuclear weapons will be triggered. All other deaths in RAMA will be followed by the showing of what has been called the generic death scene.
- 55) Once the player has reached the Iceport, as mentioned earlier, he encounters first Dr. Brown and then Nicole, who leave to talk to one another. The player is thus alone in the Iceport for some period of time. While in the Iceport, the player may explore the small area and/or pick up and look at the data cube containing Francesca's last telecast (about the RAMA correction maneuver-- it is in this Sabatini telecast also that she reports on the damaged helicopter and that Wakefield is working to repair it). If he wanders out the only pathway that does not lead to the two cities, the player will find the second bomb. It will be marked ACTIVE, unlike the first one on the ledge below the hub site, meaning that the enabling codes have already been entered.
- 56) There is really not much to do at the Iceport. After the player has found the bomb, he will soon return to the icemobile dock, where he will see spaces for three icemobiles. Two will be empty. Nicole will be sitting in the other (the player seeing the bomb is the trigger for Nicole to appear in the icemobile-- prior to that event, if the player goes to the dock, that particular icemobile will be empty). The player will enter the icemobile and Nicole will tell him the code to activate the controls, 4753. She will make some amused comments about O'Toole and his sequences when she tells the player the activation code. If the player tries to leave the Iceport, heading for the two cities, Nicole shouts for him to join her. If the player persists, he encounters an angry Dr. David Brown, who tells him that time is running out, and that he'd better go with Nicole, NOW, or abandon the search for the others altogether. Dr. Brown also reminds the player that failure to follow direct orders is cause for immediate dismissal from the crew. If the Dr. Brown "I dismiss you, return immediately to the hub site" sequence is ever played, then the game is immediately terminated.
- 57) Once the icemobile is moving (at a high speed), Nicole will begin her long monologue. She will talk about the wonders of RAMA, about her concern about the bombs, perhaps something about her background-- the monologue will be warm, personal, and friendly. There will be only

one break in it. Roughly halfway from the Iceport to New York, Nicole will suddenly turn her head and an icemobile will go by in the other direction. She will turn back to the player, before completing her monologue, and say something like "Wasn't that Yamanaka and Tabori?"

58) Upon arriving at the other end, at the shoreline near the gates of New York, Nicole and the player will see another icemobile, the one used by Sabatini, O'Toole, and Takagishi to cross the frozen Cylindrical Sea. This icemobile will be clearly damaged, and Nicole will comment that it looks as if it won't work. If the player decides to climb into this icemobile and tries to activate it, its advanced display will print out, "Malfunction. Failed self-test in four major categories."

59) The first time that the player looks at Nicole after they arrive at the island, she will observe that the gates to New York are now closed, and then make the additional comment that this is not what Francesca reported several hours earlier. She will then say something like "Go ahead without me for now. I'm going to make a quick tour in the icemobile to see if the others are waiting on a shore somewhere." The icemobile then departs and the player is on his own.

60) He approaches the gate along the ramp, passing some objects that he can examine and retain if he chooses, and then has a chance to study the huge, handsome gate. From the markings on the gate, the player may be able to discern that there are two possible states in which the gate can be. It can be open, as it was when the others first entered, or closed, as it presently is. The insertion of the illuminated inventory medallion will open the gate.

61) Just inside the gate, the player will find one of Heilmann's special data cubes, inadvertently dropped there by Yamanaka or Tabori when they were leaving. If the player has retained his decryption card from earlier, he will be able to read the memo contained therein. The memo, from Heilmann, warns Yamanaka and Tabori to stay away from O'Toole and reminds them that it was he (= O'Toole) who designated the codes and can probably inactivate them from his memory.

62) When the player goes through the gates of New York, he is on an avenue that leads to the avian piazza. New York consists of seven different elements: three piazzas, three lairs, and a maze that connects the three piazzas. Entrances to each of the three lairs are hidden in their respective piazzas. Thus the entrance to the avian lair is hidden in the avian piazza, the octospider lair entrance is concealed in the octospider piazza, and the door that leads to the human lair is hidden in the human piazza. Puzzles must be solved in each piazza before that particular lair entrance is revealed.

63) Movement between the piazzas is by means of a simple maze. The maze is not one of the puzzles in the game, but the maze controlling device is. Off each of the piazzas the player will find, in the opposite direction from the maze itself, a maze control room. The wall of these three identical rooms is decorated with a generic schematic of a maze (not this particular maze, of course, for that would give away the game) and in the center of the room is a device that has five separate settings. To activate this maze controller (and once activated, the settings can be changed from any of the three control rooms-- they are all networked together), the remaining wild card must be inserted into the proper slot. The player can then control the settings, but he does not yet have any idea what is happening as a result of his action.

64) Each of the five possible settings establishes a specific configuration for the mazes in New York. In the initial setting, a configuration is defined in which all paths between the piazzas are closed. Initially, and at any time in the future when the player sets the maze controller into this

same position, the only exit from any of the mazes off the piazzas is back into the piazza where the player started. Here then are the other four settings that the player can establish: Setting #2, possible to move between the avian and octospider piazzas; Setting #3, possible to move between the avian and human piazzas; Setting #4, possible to move between the octospider and human piazzas; and Setting #5, possible to move among all the piazzas. Each time the player changes these settings during the game, the maze reconfigures itself.

65) From an overall game flow point of view, therefore, when the player enters the avian piazza there are several different courses of action that he could follow. He could, for example, solve the puzzles in the piazza and expose the entrance to the avian lair. Alternatively, he could experiment with the mazes and the maze controllers, and visit either or both of the other two piazzas. Sooner or later in the game, the player must visit all three piazzas, solve the puzzles therein, and reveal the entrances to all three of the lairs. However, in all situations, the player must enter the avian lair before he enters either the octospider lair or the human lair. Two distinct elements are required to open either the octo or human lairs. For each of the two lairs, one of these elements is part of the inventory medallion, and the second must be found by the player inside the avian lair. Incidentally, the player has no option to return to the Iceport after he has entered the gates of New York. Nicole does not return to the dock (she sends the player vidmail saying that she is following another lead regarding the missing astronauts and that she will catch up with him later-- this message is only received by the player if he is spending time hanging around the dock instead of playing the game inside the gates) and the other icemobile never works.

66) It is worthwhile now to define the logical macrostructure of the remainder of the game, and then to return to fill in the details of the three piazzas and the three lairs. The player enters New York along the avenue leading to the avian piazza. Initially, the player is free to explore the three piazzas and all the mazes, and will perhaps discover the lair covers, but he will not be able to enter any of the lairs. After the player has located the avian lair cover AND has found Takagishi's space suit and personal effects in the octospider lair, then each subsequent time that the player exits from the mazes into the avian lair, he encounters the particular avian that the player helped escape from the biot ruin in the Central Plain. The avian, flying around the piazza, squawks several times and lands on the exposed lair cover. If the player moves directly over to the lair cover, without doing anything else, the avian opens the lair, gestures inside, and disappears therein. If the player does something else along the way, the avian takes flight and leaves the piazza, only to come back and repeat the same activity when the player enters the avian piazza the next time.

67) Once the player enters the avian lair, he is in a complex game within the game and cannot escape back to New York until he has obtained the two key puzzle pieces, one each for the entrances to the octospider and human lairs, that complement the talismen obtained earlier in Bangkok. While the player is inside the avian lair, the Cylindrical Sea melts and the player is marooned in New York. Later, after the player exits from the avian lair, he must stay on the island. If he tries to jump in the sea and swim, the shark biots kill him and send him to meet Arthur C. Clarke again.

68) When the player finishes successfully playing the avian lair, Richard Wakefield confronts him the moment he emerges again in New York. Richard has come to New York by means of the repaired helicopter, but unfortunately he has crashed it over in the human piazza and the helicopter now offers no means of escape. Nicole is currently in the vicinity of the human piazza too, still searching for the missing astronauts. She is now hobbled by a sprained ankle. After about one third of Richard's speech, the second Ramaquake occurs. Richard tells the player that RAMA has

maneuvered again, as he knew it would, and doubtless is no longer on an impact course with the Earth. Richard then informs the player that the rest of the crew has returned to the Newton and Earth, abandoning the player and Nicole as well as Sabatini, O'Toole and Takagishi. Before leaving, he continues, Heilmann et al activated and deployed three nuclear bombs, all linked together in one network, that are scheduled to explode and annihilate RAMA in some specific amount of time. Defusing one bomb will stop all of them, Richard says, and he knows for a fact that one of these bombs is somewhere in New York. Somehow, before the requisite amount of time passes, Richard, the player, and Nicole must find this bomb in New York and defuse it by inputting a specific twenty digit code in the proper place on its side.

69) Richard is highly excited when he is telling the player all this. Just before Richard finishes, he reaches into his pocket and pulls out his tiny robot Falstaff, which he hands to the player. Richard then demonstrates the operation of Falstaff to the player. "You never can tell," Richard says just before leaving, "Falstaff may be useful to you." After telling the player that both Nicole's and his vidmail systems are broken, Richard says that they will probably be mostly around the crashed helicopter. He then departs through the entrance to the mazes (Richard has reset the maze controller to the setting where movement is permitted back and forth only between the human and avian piazzas-- if the player wants to go to the octospider piazza, he must go to the other side of the avian area and change the maze controller setting). The player's task now is to find the bomb and defuse it within the allotted time.

70) The bomb is in the human lair, in a large room designed for human habitation. The bomb is guarded by a spider biot, whom the player must neutralize by activating the crane biot. Assuming that the player gains access to the bomb, and is not killed by the spider biot, he must still input the proper twenty digit code. To determine all the digits in this code, the player must explore the octospider piazza and lair, find artifacts belonging to Michael O'Toole (who is the codemaster of RAMA) that hint at what those defusing digits must be, and input the digits. And all this must be accomplished in a finite number of moves/time.

71) The state of the game when the player encounters Richard after emerging from the avian lair is somewhat uncertain. The gamer may have meticulously explored each piazza, solved all the puzzles therein, and revealed each of the three lairs. On the other hand, he may have gone into the avian lair after meeting the minimum criteria, and may not even yet know of the existence of the human lair. It is unlikely that even the most experienced player will "win" the first time he plays. The player must develop a strategy for this timed end game, and one of the most interesting challenges of RAMA for the player will be to decide how much of the piazza/maze play must be completed before entering the avian lair.

72) All three piazzas were designed by the Raman architect. Each has a common hexagonal shape, a raised platform, and an unusual polyhedral building. Other than these similarities, however, each of the piazzas is different. From a gameplay point of view, the piazzas serve a common function. In addition to being lovely to see, each provides the location for a multistep puzzle whose solution will reveal to the player the lair entrance for that particular species. The puzzles in each piazza are, of course, markedly different, even though the payoff for the solution is functionally the same.

73) Along the avenue heading from the gate to the avian piazza, the player will have an opportunity to pick up several inventory items, one of which will be a tuning fork (five of these are scattered around New York). The player will also see, just before he enters the piazza itself, a

strange alcove, containing statues of five tuning forks. The purpose of this alcove is to demonstrate the characteristics of the tuning forks, which play a significant role in the puzzles in New York. To solve puzzles later, the player must use two of the five tuning forks he finds. How to distinguish between these tuning forks, as well as how the deaf octospiders manage to use such implements of sound, is presented in the alcove.

74) The entrance to the avian lair is concealed when the player first enters the avian piazza. It will not be revealed until the player successfully completes an optical search puzzle that is set up inside the tetrahedron on one side of the piazza. Before he can enter the tetrahedron in the first place, the player must solve an additional, multistep puzzle. Placing the avian ring he is carrying (from the avian in the giant biot ruin-- one of the inventory medallion items) on the neck of the avian statue outside the tetrahedron will cause the door handle to appear; later, from inside the single accessible skyscraper adjoining the piazza (whose door can be opened by using the proper tuning fork), the player will discover what he must do to reach the tetrahedron door handle. Once the avian lair entrance can be seen, the player may try to open it. His effort will be fruitless. The player will not be able to open the avian lair cover until he is invited for a visit by the avian he helped on the Central Plain.

75) To enter either of the other two piazzas, the player must properly set the maze controller upon his departure from the avian piazza. Otherwise, he will simply return to the piazza in which he started. The octospider piazza, and its puzzles, are all associated with colors, which is fitting since the octos communicate in a soundless language of colors. In this piazza, the player must figure out how to enter the octohedron, inside of which is a puzzle whose solution causes the octospider lair cover to become visible. In a paradigm similar to that employed in the avian piazza, to enter the octohedron the player must first obtain a prism that can be found in a skyscraper adjoining the piazza. Once inside the polyhedral building, the remaining color puzzle's final solution causes the lair entrance to become visible.

76) There are two other special characteristics of the octospider piazza. First, somewhere near the fountain the player will find the spacesuit and other personal effects of Dr. Shigeru Takagishi. Of particular importance is Takagishi's video camera, which contains, among other things, at least two data cubes, one a video beginning with a pan around the piazza and concluding with a pair of octos moving away from Takagishi (and out of the piazza), and the second, also a video, containing the last twenty seconds of his life. In this recording, the picture follows a slithering black and gold tentacle around behind a structure, into a nest of octos, and then changes to total blackness. Also, in the skyscraper next to the piazza, where the player finds the prism, he encounters as well a photo of Michael O'Toole and his wife mounted in a collection of octospider artifacts. The player must use a green lens to open the clamps holding this important photo. On the back of this photo (the item can be turned around once it is in inventory) is writing indicating that the picture was taken on a specific numerical anniversary of the O'Tooles. Underneath this writing, a big number (call it X for the moment) has been written and circled, as well as the word CODE. This is obviously one of the clues for the bomb code.

77) In his original vidmail at the hub site, Michael O'Toole talked about his fascination with numbers, and especially the quadratic prime sequence starting 41, 43, 47, 53, 61, 71, 83, 97, 113, 131, 151, 173, 197, 223, 251, 281, 313, etc., in which each of the first forty numbers in the sequence is another prime number. The code that must be input to defuse the bomb has been created by O'Toole and is made up of FIVE numbers from this sequence, each being indicated by four digits (thus 41 becomes 0041, and 131 becomes 0131, etc.). To help himself remember

WHICH five numbers from this sequence form the defusing code, O'Toole has created mnemonic devices, three of which the player may find if he plays the game well. The photo above, with the circling of the number on its reverse side, is the first of those devices. On the back of an O'Toole catechism card in the octospider museum, down in the octo lair, the player will find the written expression, "15, , , 33", indicating that there are five numbers altogether, the first of which is fifteen, and the last of which is thirty-three. In the room containing the octo morph nest, the player, using Falstaff as his surrogate for exploration, will find O'Toole's ~~Universal Identity Card~~, on which is circled the month and date of his birthday, namely 3 and 29. Thus the five numbers that define the code are 15, X, 3, 29, and 33, where X is the number on the back of the photo of O'Toole and his wife and corresponds to their Xth anniversary.

78) Four versions of the back side of the O'Toole anniversary photo will be stored in the game, corresponding to the 19th-22nd anniversaries. Thus the fifth and final number X in O'Toole's code may be 19, 20, 21, or 22. Each time a new game is started, the game will internally set to one of these four numbers, and a unique bomb code will be established. The photo, the catechism card, and the Universal Identity Card are all mnemonic devices to remind O'Toole of which specific numbers in his favorite special sequence starting with 41 have been used to define the code. The third number is 0047, for example; the fifteenth is 0251; the twenty-ninth is 0853, and the thirty-third number in the quadratic prime sequence beginning with 41 is 1097. These four numbers are in every game, with the fifth key number being 0383 (19th in O'Toole's sequence), 0421 (20th), 0461 (21st), or 0503 (22nd), and changing with each new game.

79) In the game, on the bomb itself the player will find the 7th through 10th digits of the code ALREADY ENTERED (O'Toole was trying to defuse the bomb himself when captured by the octos), which will uniquely define the second and third numbers in the empty positions on the back of the catechism card. Every time the game is played, the first four digits of the defusing code will come from the 15th number in O'Toole's sequence, namely 0251. Similarly, the last four digits will always come from the 33rd number in the sequence, specifically 1097. The fifth through sixteenth digits, however, will be determined by the third, twenty-ninth, and nineteenth through twenty-second numbers in O'Toole's sequence. If the 7th through 10th digits already entered on the bomb, for example, are 4708, then the player knows that the third number in O'Toole's sequence is the second one in order, and that the fifteenth number in O'Toole's sequence is the third one in order. Thus, for this particular configuration, the complete bomb code could be deduced to be 025100470853xxxx1097, where the xxxx corresponds to the floating anniversary number on the back of O'Toole's photo with his wife. If that number is 19, then the unique bomb code for that game would be 02510047085303831097. The four bomb codes in the game will correspond to the following O'Toole sequences: (15, 3, 29, 19, 33) (which is the one above), (15, 29, 3, 20, 33), (15, 21, 3, 29, 33), and (15, 29, 22, 3, 33).

80) The puzzle structure of the human piazza follows the same general flow as the other two piazzas, but is slightly more complex. To enter the weird pentahedron, a tuning fork must be used. Once inside the pentahedron, if the player looks out in a certain direction, from a special spot, the location of the human lair entrance can be discerned. The player must then follow a mantis biot into a complex underground system puzzle which will, if solved, enable the player to position himself next to that human lair entrance. Recall that to enter both the human lair and the octospider lair, four items altogether are needed-- two lair specific talismen from Bangkok (both of which are part of the inventory medallion) and two "keys" obtained by the player in the avian lair. If the player has put down either of the objects necessary to enter the human lair prior to reaching this point, he must now go back and recover them.

81) To minimize the amount of game play necessary after emerging from the avian lair (and thus reduce the probability of not finishing before the nuclear bombs annihilate RAMA), the player may choose to solve all the puzzles in all the piazzas, thereby exposing all the lair covers, before accepting the avian's invitation to enter its lair. This would allow the maximum time for the player to spend inside the octospider and human lairs.

82) When the player follows the avian he rescued into the avian lair, he enters a special world, a game within the game, which must be played to completion before the player can return to the rest of RAMA. The play purpose here is basically simple-- the player's task is to locate and acquire the second "keys" necessary to open the octospider and human lairs. Those keys, however, can only be obtained after solving a sequence of multistep puzzles that exist in and among the four levels or floors in an inhabited underground alien labyrinth on either side of a deep shaft. Once the player follows its special avian to the great hall, and meets the muckymuck of all the avian tribes, the ledges he used to descend the central shaft are retracted and the player is essentially a prisoner. The player can extend these ledges by operating the ledge controller in the security control room. But he will not be permitted to operate that ledge controller until he has secured in his inventory the two keys that will be needed for the other lairs.

83) The play inside the avian lair should last for many hours. Eventually the player will determine how to extend the bridge that enables him to visit rooms on both sides of the central shaft. Inside the lair the player will also visit the hatchery of the avians, the schoolroom, and the theater. He will interact directly with several of these avians and, if he performs properly, will be given a ~~squawk box~~ by them that will enable him to open doors using avian sounds. It will be necessary for the player to learn alien numbers (the same ones to which he was exposed inside Bangkok), so that he can move freely around the complex avian lair. To help him navigate, a **symbolic map**, indicating the numbers of the various rooms, will be found in the hatchery, where the myrmicats used it to explain the layout of part of the lair to the avian hatchlings. Parts of the map, however, as well as some of the other critical gameplay clues in the avian lair, have been designed using ultraviolet writing. The player can only read these ultraviolet clues immediately following his eating a **manna melon**. Some of these clues will lead him to discover the burned out domain of the avians' symbiotic partners, the myrmicats, where one of the critical keys is hidden. All these elements of the game must be worked out by the player before ascending again to the security control room and exiting from the lair.

84) By the time the player enters either the octospider lair or the human lair (and the game allows them to be played in either order-- it would be impossible, however, to know the bomb code without the clues from the octo lair), the countdown clock on the bombs is ticking and is constantly inset on the screen. With each movement, and each extended period of inactivity, the amount of time left for the player to solve the bomb puzzle is reduced. Nevertheless, the player must continue to explore carefully everything he sees, even in these two lairs, or he will not have a high probability of completing the game successfully.

85) A segmented, descending ramp leads into the octo lair, which leaves the player in the center of a domed circular room, the octospider atrium. At the bottom of this ramp, the player steps on a pad and hears a sound. Above him, the configuration of the pattern on the dome has been reset. Every time the player returns to that spot in the game, the beautiful colors in the dome, like a kaleidoscope, change to another configuration. At first, of course, the player has no idea of the purpose of this dome. Later he discovers that the dome, together with the abacus off one of the lair

corridors, controls the toggling of the spikes in the vertical cylindrical structure that is the only means of descent to the subway station on the lower level of the octospider lair.

86A) Four corridors (from left to right, with the player standing on the pad after having descended the ramp, they are Eenie, Meenie, Mynie, and Moe) are scattered around the atrium, the first pair leading to the left, and the second pair going to the right. All four corridors have gates, which may be opened by inserting one of the colorful octospider tetrahedrons (a few of these have small octo keys have already been encountered in New York, and may be in the player's inventory; however, none of the three locked gates off the atrium can be opened by tetrahedrons picked up on the surface of New York) into the locks, but only Moe's gate (first corridor on the player's right) is standing open when the player arrives. When the player enters Moe, he soon sees a magnificent sight-- a pair of octospiders dancing in front of a brilliant color display coordinated with dancing waters from a cistern. Their dance is choreographed to include, as an integral part, Francesca Sabatini's spacesuit, which has been laid out neatly on the ground in front of the octos. Since octospiders cannot hear, their music is varying bolts of color sequentially projected on the wall behind the cistern. The octos continue to dance for about seven seconds after the player first sees them. They then see him and immediately stop dancing. They turn off their tune quickly and exit through a gate at the back of Moe which they lock behind them.

86B) Everywhere else in the game, whenever the octos move anywhere near the player, the sound of brushes dragging on metal will be heard, as well as the musical leitmotif of the octos. Since the octospiders are deaf, they have made no effort to design pleasing sounds into their gates, doors, etc. In the dance sequence, however, the octo sounds are muted.

87) ~~Francesca's~~ Francesca's space suit is a treasure trove for the player. In addition to her personal effects, her space suit contains a decryption card in one pocket, which the player can install in his computer and then read all the coded messages written by Heilmann and his henchmen. Her computer contains a vidmail message from Dr. Brown that makes it clear he knew about the deployment of the bombs and one message from Heilmann asking Francesca to steer Takagishi and O'Toole away from where the bombs will be placed. From both the Brown and Heilmann vidmails the player will learn again about O'Toole's role as codemaster for RAMA, giving a hint about what the nature of the digits on the side of the bomb might be. In her pockets are also two additional data cubes containing telecasts that were never actually made, although it was clear that Francesca was already thinking about them and practicing what she was going to say. In one Francesca discusses the security issue (it is obvious from the voices on this mock telecast that both Brown and Heilmann were present when she taped it), and how the decision was made to destroy RAMA even though some of the crew had not been found. In the second practice telecast, Francesca imagines that RAMA has been destroyed and asks journalistic "what if" questions.

88) When the octospider "music" was turned off, the gate from Moe to the atrium closed and locked. Just on the other side of the gate that the octospider pair used as an exit, a tetrahedron is lying on the ground, out of the reach of the player. The only way he can obtain that key, which will open Moe and allow him to return to the atrium, is by using Falstaff. In a sense this session with his little robot (it is very simple. Falstaff is quite intelligent. He is put down on the ground, he moves forward and retrieves the key, then returns to the player) is practice for the later use of Falstaff in the subway station.

89) But the key to Moe is not the only significant gameplay feature in this particular area. Where the octos have been dancing there is a cistern, allowing the player both to drink and to review his

octo numbers, and an apparatus that allows the player to see octo music. The player can activate this apparatus and watch four octo tunes. At the conclusion of two of them, one of which was the earlier dance tune for the octos, the sound of a door closing will be heard. If the player, during the playing of one of the octo tunes associated with the door, looks in the proper direction, he will see an open door and a rack of **tetrahedrons** behind a locked gate.

90) A specific **tetrahedral key**, one that was in the room not far from O'Toole's anniversary photo, must be used to open this gate and gain access to this rack of the remaining tetrahedrons. All the octo gates work on a very simple principle. Two colors are "shown" to the gate to trigger the release of its locking mechanism. Most octospiders themselves simply flash the colors on their heads to open these gates. However, since the octos stand at the hierarchial top of a pyramidal society with many other species, and since some of the octos have difficulty controlling their colors with the precision required to open the gates, an alternate way of opening all the gates has been devised. Each tetrahedron has a color on either end. Each lock needs two colors to open. In the alcove rack close to the cistern/fountain is an organized collection of all the rest of the tetrahedrons the player will need to open all the gates in the octo lair. Some of these tetrahedrons, however, have been purposely left elsewhere in New York.

91) Once the player figures out that the tetrahedrons provide him with a way to open all the octo gates, his task simply becomes to match the colors on the locks with the tetrahedrons and complete his exploration of the octospider lair. He may choose next to enter Mynie, although at first glance the player will be disappointed by what he finds. At the far end of Mynie there is a pile of rubble blocking additional progress. Amongst the Mynie rubble are two critical items, however, both the **tetrahedral keys** for the two gates in front of the descending cylinder with the spikes.

92) Eventually the player will enter either Eenie or Meenie on the other side of the atrium. Every time he returns to the pad in the center of the atrium, the kaleidoscopic dome will change its position. If the player does go into the Eenie corridor (the first one on his left when he entered the lair), he will come upon an abacus in an alcove. **The abacus** is part of a puzzle connected both with the dome in the atrium and with the spikes in the descending cylinder. When the player sets the abacus to the number currently indicated in the dome, the spikes toggle. In other words, the player cannot descend to the subway station below until he figures out this puzzle. Later, when the player approaches the lip of the descending cylinder, he can see the spikes protruding. Stepping on the lip, however, causes the spikes to retract. If the abacus is set to the number indicated in the dome, the reverse is true. In this case no spikes can be seen when the player approaches the cylinder. However, when he steps on the lip, the spikes extend, making it possible for him to descend to the subway station.

93A) Off to the left of Meenie, two thirds of the way down the corridor after passing through the gate near the atrium, is the entrance to the fabulous octospider museum, full of artifacts and other game elements. In the outer room of this museum, the player will see a stuffed Takagishi and avian, a nuclear bomb crate, and six quadroid pictures that are astonishing. **The six photos** taken by the microscopic quadroids are as follows: 1) Sabatini and O'Toole standing in front of the crated bomb in the human lair, near the wheel puzzle; 2) a closeup of the bomb and its code, showing the 20-digits with the 7th through 10th digits filled in; 3) Heilmann in profile, with two ISA suited men bending down in front of him, next to the bomb (they are obviously Yamanaka and Tabori, seen from the back); 4) Nicole in the icemobile at the Iceport, beckoning to the player to join her; 5) Takagishi lying on a table, his spacesuit partially open, with an octospider doctor

examining him with weird instruments; 6) the inside of the great hall of the avians, where a meeting is occurring that is presided over by the great muckymuck.

93B) The inner room of the museum is where octospider scientists conduct their research. It cannot be seen from the outer room. There is a typical octospider lock on the closed door; however, there are no colors suggesting which tetrahedron might open it. Nothing the player can do the first time he enters this outer room will allow him to enter that inner room. He must properly signal the octospider scientist from down in the subway station first.

94) Once the player does determine how to enter that inner room, he has a direct contact with the octospider doing research there. This particular octospider has created its own machine both to help it understand the relationships between human and octo numbers and to ascertain the significance of the special prime sequence starting with 41, whose elements are on a carved plaque the octos have recovered from O'Toole (the plaque was a sixtieth birthday present from his family). When the octo sees the player, he continues with his work, now attempting to involve the player. He presents a simple octospider number identification problem-- if the player successfully does what the octo is requesting, the octospider gives him Michael O'Toole's **special necklace and amulet**, indicating that the octo has recently been in close proximity to O'Toole. Solving the octospider's second numerical problem will earn the player O'Toole's **catechism card**, on the front side of which is the Biblical verse John 3.16, "For God so loved the world..." As mentioned before, O'Toole has clearly written on the back of this card the words CODE and 15,.....,33, which suggests that the bomb code has five numbers, the first and last of which are 15 and 33 in some reference system. The octospider color bursts that follow the player's successful efforts indicate that the alien is delighted. Pleased with itself and the player, the octo turns its machine off, and departs from the museum through a secret door in the back. If the player looks around carefully at this point, he will notice that the departure of the octospider has created three new hotspots in the room. It is now possible for the player to remove O'Toole's **plaque** (as a reference for the rest of the game) and to take the remaining **food pellet from the bowl** from which the octo scientist has been intermittently eating. Also, over in one corner the octo scientist has dropped a **snapshot of the closeup of the bomb**, with the digits showing, that was one of the large pictures in the outer room of the museum.

95) The final critical clue to the 20-digit code necessary to defuse the bomb is found down in the lower level of the octospider lair. Once the player opens up the gates around the vertical cylinder, and figures out how to make the spikes protrude when he is standing on the lip, he can then climb down to this lower level in a non-interactive sequence. At the bottom of the cylinder, the player will first find another abacus and dome arrangement (these two will be closer together than the first set) so that the spikes can be extended when he is ready to climb up again. On the other side of the domed room the player enters a circular subway station. Two subways are parked in the room, one hundred and eighty degrees apart. One is a large, normal-sized subway, which will not go anywhere. The only subway is tiny, but it can be activated if the player decides to deploy his robot Falstaff. Also in the station is O'Toole's **crucifix**, a red herring that contains no information that helps in the play of the game.

96) Although the large subway is dark and currently not in use, at times other octospiders, from elsewhere in RAMA, come into this station. For some, it is their first visit to the lair and they need to know the details of its layout. Hence a large standing map in the domed room presents a diagram of the portion of the octo lair that the player has already explored, as well as the octo morph realm down at the other end of the tiny subway tunnel on the opposite side. What is

particularly important about the map is that there is a clear designator highlighting the inner room of the octo museum, and a button that seems to be related to that room. Pressing the button is a signal to whatever octo scientist might be working in the back of the museum. On the map, a pair of colors flash on the space for the inner room of the museum. Those two colors show which key that particular octo used to enter that day, and designate the tetrahedron with which the player can now open that inner room after he goes up the spikes.

97) The player must activate Falstaff and put him on the tiny subway, following the instructions given to him by Richard Wakefield. Once the Shakespearean robot has been deployed, and the point of view in the game switches to Falstaff's view, the robot can go inside the dark, tiny subway whose door is open. A control panel is lit, and the player must use Falstaff's controls to find the right combination of conditions causing the door to close and the subway to accelerate into its tunnel. Falstaff makes comments throughout this sequence. (The larger subway, incidentally, has a similar control panel. Its panel, however, is not lit or activated, and the only thing that the player finds inside is [^]Francesca's scarf.) Once the tiny subway zooms away, there is a non-interactive sequence in the tunnel (seen through Falstaff's eyes) that continues until a stop is reached. Through the glass window of the subway Falstaff can see an octospider and several midget morphs apparently waiting for him in a large, organic room whose central feature is a morph nest, a large, nutlike object wrapped in fabric. If the player causes Falstaff to open the door of the subway and enter the room, Falstaff will quickly find a long tool which emits a beam. The player will have seen a similar tool back in London, and should remember that it activates the crane biot. Walking around the room as Falstaff, the player will also see O'Toole's Universal Identity Card, but Falstaff's passage to the card will be blocked by the presence of the octomorphs.

98) Falstaff can go back and forth on the subway. He may return to the player with no new items, or one, or two. The player can come back and redeploy Falstaff whenever he wishes. Notice that the player will need to make at least two descents down the spiked vertical corridor. The player cannot enter the inner room of the museum without "buzzing" the octo scientist and activating the door lock. He cannot obtain the octo food until he has been into the inner room of the museum. Thus, it is most likely that the first time Falstaff goes down the subway, he will return only with the beam tool that activates the crane biot. There will be ample Falstaff dialogue to handle both of these expected trips down the subway.

99) Once the player has obtained the octospider food, and handed it to Falstaff (who does some funny things with it on camera), Falstaff can return to the octomorph nest, place the food pellet down in the empty corner of the room, watch the morphs scurry over to eat it, and then retrieve O'Toole's Identity Card. On the back of this card his birthday is shown, 3-29-42, with the 3 and the 29 prominently circled and the word CODE written. As mentioned before, these are the last two numbers relating to the special prime sequence that O'Toole has used to define the bomb code. When Falstaff returns to the player in the subway station, he may have no items, or one, or two. He will have a little something to say to the player in each of those situations.

100) The player may enter the human lair at any time in the game after he exits from the avian lair. However, his purpose in the human lair is to locate the bomb, enter the code, and defuse it. It is unlikely that he will know what numbers to input into the bomb if he has not fully explored the octospider lair. The human lair is not as complex as the other two. After descending the ramp, the player finds himself in an area that has not yet been completely constructed. Off to the left is a wide open, undeveloped space that may be used in later RAMA games. To the right is a large numerical wheel puzzle that is blocking the player's entrance into the heart of the lair. One of the

photographs in the octo museum showed O'Toole, Sabatini, and a crated bomb standing in front of this wheel puzzle. After solving the puzzle (a replica of which was found in each of the other two lairs, indicating that the other species have already learned how to relate the numbers of the three different denizens of RAMA) by correctly aligning the three concentric wheels to identify the same numerical element in each of three different systems, the wheel moves aside and the player sees the single large room in the human lair, decorated by the Ramans with human objects.

101) The bomb is in the back of the room, guarded by a spider biot who is pacing around threateningly. The player can move freely around the perimeter of the room without causing the spider biot to charge. However, if the player breaks into the spider biot's domain, the spider will then relentlessly pursue the player and kill him. Around on one side of the room is a crane biot that is facing away from the player. The player cannot use the beam tool to activate the crane. From one vantage point in the room, however, it IS possible to see the crane's activation plate through a mirror hanging on the wall. What the player must do to neutralize the spider biot is point the beam tool at the crane's plate as seen on the mirror. Then the spider biot is immobilized for some finite number of moves/time. If the player leaves the room without having input the correct bomb code, upon his return he will find that the spider biot has gone. Actually, the player's nemesis is lurking just outside in the hallway. The player has as much time as he needs, provided he stays in the room, to input the proper code on his second visit. If he leaves the room a second time, even for an instant, the spider biot sends him into the arms of Arthur C. Clarke. Of course, all during this time the bomb clock, projected on the screen, is continuing its countdown.

102) If the player then successfully enters the bomb code before the clock ticks down to zero, the non-interactive end sequence of the game is triggered. The player hears Nicole urging him to join Richard and her on the surface of New York. The biots move out of the way for the player to move down the halls of the human lair, to the ramp, and then up to the surface of New York. Triumphant music is playing. Nicole and Richard each congratulate the player as the music swells and rings of color, emanating from the Big Horn, drift across RAMA. At this point Arthur appears in the human piazza, accompanied by a centipede biot, an avian, and an octospider, and both adds his congratulations and encourages the player to return for another RAMA gaming adventure.

THE END