

## AFRISPACE

by

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"Earth is the cradle of mankind, but one does not stay in the cradle forever." Today, about one hundred years after Russian astrophysicist Tsiolkovsky wrote those words, a human presence is being established outside its rapidly shrinking and deteriorating cradle. Hundreds of satellites orbit the earth while deep space probes survey our system's other planets and their moons. Our fleeting footsteps on the moon have been followed with an enduring domicile called *Salyut*, aboard which cosmonauts live and work in space for months. With so finite a planet and so grand a universe, space travel was certainly inevitable. However it is with breathtaking speed that this forlorn frontier is being exploited.

Cognizant of the rapid advances being made in space technology, the United Nations brought the rule of law to outer space by passing, in 1967, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space ("Outer Space Treaty").<sup>1</sup> This Treaty embodied the revolutionary concept that "the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."<sup>2</sup>

Contrary to the commands of the Outer Space Treaty, the benefits countries have reaped from the exploration and use of outer space have largely been an increasing function of their economic and scientific development. Outer space, legally "the province of all mankind", is today an arena in which only the technologically advanced compete.

This disparity between what the world's nations agreed upon, in the Outer Space Treaty, and what is occurring in practice, may be traced to the failure of the United Nations to establish a mechanism by which tools developed by technologically advanced States are shared with, and used for the benefit of "all countries, irrespective of their degree of economic or scientific development".<sup>3</sup> Although space may be the "province of all mankind," it has become clear that only those peoples of the world who actively seek the promise of space will be able to secure for themselves its manifold benefits.

There is perhaps no part of the world which could benefit as greatly from an active space program as Africa. An African presence in space will, however, result only from an African demand for such a program. The suggested vehicle for this space effort is an African Space Consortium ("AFRISPACE"). After a brief discussion of some of the many benefits which will flow from the formation of AFRISPACE, this paper explores possible strategies for the consortium's formation.

The most striking benefits existing national space programs yield are in the fields of communications, defense,<sup>4</sup> meteorology and resource detection. In each of these fields, the relative benefits to Africa will be much more significant than those enjoyed today by existing space powers. The advantages which will flow from prospective space programs are of such great magnitude as to create capabilities in the exploiting entity which cannot be matched by any earth-bound State. It is through these future space programs that Africa will be able to leap into a position of world power and foremost socio-technical development. Let us sample the benefits existing space programs yield with a brief review of communication satellites.<sup>5</sup>

Communication satellites are simply a means of relaying electronic messages between points on the earth's surface. Rather than linking two points by wire, cable or microwave relay stations, a message can be sent up to a communications satellite which then retransmits the message back down to the destination. A satellite positioned in geostationary orbit<sup>6</sup> above the earth can relay messages between any number of points over a third of the earth's surface.

Although simple conceptually, communication satellites create many new opportunities. For example, Indonesia desired to create a communications network which would link its many islands together. To do this without satellites, it would be necessary to lay thousands of miles of cables under the ocean. However one communications satellite and an antenna for each island to be brought into the network accomplished Indonesia's objective at about one percent of the cost of a cable system. Similarly the Soviet Union chose to have trans-Siberian communications accomplished via satellite rather than erecting a terrestrial microwave relay system across its forboding frigid frontier.

It would be a gargantuan task to directly link Africa's many cities and towns together by wire, cable or microwave relay. The distances are too vast, the terrain is too uncompromising and the capital cost is too prohibitive for a terrestrial pan-African communications network. However, a single communications satellite would instantaneously connect every locale

on the continent provided with an antenna. To add a new locale to a communications network based on a terrestrial, wire system, one must erect many poles and run much wire. Should weather conditions knock down a pole, the system is out. To add a new locale to a satellite communications network, one simply installs an antenna<sup>7</sup> in that locale. The satellite, far above our atmosphere, dependably relays communications regardless of meteorological conditions.

Clearly, a communications satellite system is the only sensible way to establish an independent pan-African communications network. The benefits of such a system should be apparent in an age when information is quickly becoming the currency of power. Nevertheless it should be emphasized that a pan-African satellite communications network will be an absolutely essential tool in accomplishing the eco-political integration of Africa's ample supply of nations. The sacred borders of Africa's many sovereign States are impediments to the realization of gains from intra-African trade<sup>8</sup> and obstacles to the growth of knowledge resulting from the exchange of ideas.<sup>9</sup> The borders function like the rods inserted into atomic reactor cores to dampen and subdue what would otherwise be a quickly accelerating generation of energy. There clearly must be economic and political integration among African States if the continent is to generate positive energy and play an active role in world events.

The subordination of nation-states to supranational entities is no easy task. But a communication infrastructure is an essential element of any plan to unify different countries. First, a pan-African communications system is inherently transnational. The electro-magnetic waves which carry satellite relayed communications recognize only physical limits, not man-made political borders. And the very creation of a pan-African network would signify to all the need to broaden allegiances continent-wide. Secondly, this satellite-based network will be the physical glue which keeps newly integrated eco-political entities together. Without such a bond, those not in communicative touch inevitably drift away.

Thus we have seen that only through a pan-African satellite communications system can Africa "leap-frog" into communicative parity with the developed world. The role such a system can play in facilitating eco-political transnational integration is but one example of the many benefits such a network will yield. Other benefits, including radically improved education and health care, enhanced economic development, and the growth and transmission of culture, are examples of goals the satellite network can make realisable on a much more proximate horizon.<sup>10</sup>

Prospective space capabilities include the ability to construct satellite solar power systems, to manufacture in orbit high technology electronic components and to mine the moon and asteroids for natural resources. This sampling of prospective space projects certainly sounds futuristic. However, American space officials readily concede solar power satellites are within current technological capabilities<sup>11</sup>, the Soviets have already experimentally manufactured electronic crystals in space of a quality superior to that achievable on earth (and at a fraction of the cost)<sup>12</sup>, and the General Assembly is now considering passage of a Treaty relating to the Moon and Other Celestial Bodies which refers to the "orderly and safe development" and "rational management" of "the natural resources of the moon".<sup>13</sup> Let us explore the Solar Power Satellite and its relevance to AFRISPACE.

Solar Power Satellites are large structures in orbit around the earth which convert sunlight to electricity and then transmit this electricity to receiving antennas on the earth's surface. The primary advantages of solar power over conventional or atomic power generation are that the sun is an inexhaustible resource and it is an environmentally clean source of energy. Furthermore, whereas energy produced on earth requires scarce hidden resources to be mined and transported to a power plant, a solar power satellite in geostationary orbit can instantaneously direct its flow of energy to any point within about a third of the earth's surface.

The capitalist West, with its huge investments in oil and atomic power generation, is loathe to develop solar power as this undercuts the value of their existing resources<sup>14</sup> and because the sun's output cannot be controlled and monopolized as can that of scarce resources. Sub-saharan Africa, not bogged down with heavy investments in atomic power plants, has no similar disincentive. Furthermore, Africa's many open spaces are prime areas for placing solar power receiving antennas. The absence of such undeveloped and unregulated areas in the West has further retarded the popularity of solar power generation.<sup>15</sup> If Africa began now to move ahead with solar power, it would be coming on to a rich energy stream just as the rest of the world's productivity was shrinking from scarcity of fuel.

This situation with regard to solar energy, like that of space manufacturing and extra-terrestrial resource development, exemplifies a reality that will be quite apparent within a couple of decades. The world's incessantly increasing demand for resources is gradually exceeding the planet's ability to provide. The extra-terrestrial environment, our solar system, has a resource potential many times that of earth.<sup>16</sup> Over time, space resources will account for an ever-increasing

proportion of human productive capacity. The West will delay in exploiting space resources because those in control of production are concerned only with short-term financial gain and thus will try to squeeze all they can out of their existing terrestrial investments. Those who are pre-eminent in space development will constitute the 21st century's major force in world events as space resources gradually replace terrestrial resources as the foundation of human civilization.

Africa is in a prime position to become the major force of the 21st century. But to do so, there must be action while the West squeezes its final dividends from its industrial revolution. Euro-American pre-eminence is attributable only to the relatively small head start in certain technologies it established and maintained during the past few centuries. The rest of the world, languishing in the culture of older technologies, was easily overrun. There can be no doubt that the new technology will be that of space. While most of the world languishes in the Euro-American culture of Terrestrial Industrialism, Africa must forge ahead with space technology. It is to the question of how this might be accomplished, that we must now address.

It was mentioned above that an African Space Consortium, or AFRISPACE, should be formed to coordinate and direct the continent's quest for pre-eminence in space technology. Membership in AFRISPACE should be open to all African States except racist Rhodesia and Nazi South Africa.<sup>17</sup> An equitable mode of decision making authority should be established. Participation in all international space-oriented bodies should be initiated.

Dues in the form of a small percentage, or fraction of a percent, of GNP should /could be collected by AFRISPACE from member nations. These dues could then be transferred back to the donating country as payment for a service in furtherance of AFRISPACE's goals. For example, one country's dues could be spent in that country to pay for education of scientists and engineers, establishment of research laboratories, construction of metal processing plants, leasing of launch sites or building of subsystem assembly factories. The decisions on how to spend member countries' contributions should be a joint decision of AFRISPACE officials and the contributing countries' representatives. Particular attention should be given to what the country can most efficiently provide and what the consortium most urgently requires. With this type of plan, AFRISPACE's pan-African goals and the country's domestic development plans are both furthered simultaneously. This method of organization thus ensures pan-African participation, combats the unwillingness of hard-pressed economies to lose any fraction of their national income, and develops space industries throughout the

continent.

Further fund-raising efforts should be directed at the United Nations. The developed world has repeatedly agreed, in several treaties, that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development.<sup>18</sup> AFRISPACE should demand the space powers contribute funds and technology to the consortium's efforts and insist on participation in current and prospective space projects.<sup>19</sup> The consortium will be in a persuasive position since it can cite supportive language in international treaties and it can claim a substantial proportion of the United Nations family among its membership.

As AFRISPACE acquires expertise in space technology, it will be able to earn income from its space activities. This might include leasing communications satellite channels and performing launch services. These few suggestions can, of course, be multiplied many times.<sup>20</sup>

In summary, AFRISPACE is a pan-African project designed not to catch-up with the West, but to leap ahead. One must always aim ahead of a moving target; Africa, unburdened with heavy investment in the increasingly obsolescent tools of the industrial revolution, must skip that wasteful age and occupy the field of space technology. It is hopeless and senseless to follow the West's historical pattern of development. This route only bleeds Africa to the benefit of long entrenched imperialistic interests. But their power, like their resources, is on the wane. Before they regroup, Africa must set the future pattern of development. This development must occur in space. It's potential far exceeds the spoils of imperialism; its promise awaits only demand.

The establishment of a superior African presence in space involves much more than simply leaving our cradle earth. It will be a challenge of unprecedented dimensions. The creation and activation of AFRISPACE is a certain first step towards the day when Africans continent-wide exchange thoughts via satellite at the speed of light, when solar power driven African industry makes material comfort a birthright of its peoples, and when the crest of human technological and social achievement returns to humanity's birthplace. Upon such a foundation, our unborn children, "now latent in our thoughts and hidden in our loins, shall stand upon this earth as one stands upon a footstool, and laugh and reach their hands amidst the stars."<sup>21</sup>

Footnotes

1. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, opened for signature January 27, 1967, T.I.A.S. 6347, 610 U.N.T.S. 205 (hereinafter cited as Outer Space Treaty).
2. Outer Space Treaty, art. I.
3. But see article XI of Draft Treaty Relating to the Moon, United Nations General Assembly, Committee on the Peaceful Uses of Outer Space, Report of the Legal Subcommittee on the Work of its Eighteenth Session, A/AC. 105/240, April 10, 1979, calling for establishment of an international regime to oversee "an equitable sharing" of lunar resources with "special consideration" given to developing countries.
4. This includes both ballistic missile technology and "spy satellites". The defense value of the latter to Africa was made clearly evident when Soviet Defense satellites revealed South African attempts to develop atomic weapons. Defense satellite photographs of South Africa should also prove to be of great value in coordinating military strategy against the Fascist regime.
5. For a more comprehensive review of communication satellites, see Twentieth Century Fund Task Force on International Satellite Communications, *Communicating by Satellite*, 1969.
6. This orbit is about 36,000 kilometers above the earth. An object at this altitude orbits the earth at the same velocity as the earth's rotation about its axis and, therefore, remains stationary above a point on the earth's surface.
7. The size and cost of the antenna varies inversely with the transmitting power of the satellite.
8. See generally, Herbert Grubel, *International Economics*, 1977.
9. See L. White and R. Leigh, *Peoples Speaking to Peoples: A Report on International Mass Communication from the Commission on Freedom of the Press*, 1946; UNESCO, "Meeting of Experts on the Use of Space Communication by the Mass Media", 1966.
10. For a more in depth review of the benefits communication satellites yield, see UNESCO, *Communication Satellites for Education, Science and Culture*, 1968; Jasentuliyana, "Direct Satellite Broadcasting and the Third World",

*Columbia Journal of Transnational Law*, 1974.

11. NASA, *Satellite Power System: Concept Development and Evaluation Program*, 1978.
12. Hooper, G., *Missions to Salyut 6, Spaceflight*, May 5, 1979.
13. See note 3 *Supra*.
14. For an exposition and wealth of data in support of the thesis that the capitalist West is hesitant to invest in space systems which render their terrestrial investments obsolete, see M. Kinsley, *Outer Space and Inner Sanctums: Government, Business and Satellite Communications*, 1976.
15. U.S. Department of Energy, *Preliminary Environmental Assessment for the Satellite Power System*, 1978.
16. G. O'Neill, *The High Frontier*, 1977.
17. After the people's forces of progress achieve victory, Zimbabwe, Anana and Namibia would of course be welcome members. The mineral wealth and productive capacity of Southern Africa will greatly aid AFRISPACE's goals. Hence pan-African military action against the Nazi South African regime is imperative. An African missile and armaments industry should be one of the first "spin-offs" of the same program herein described.
18. For a review of treaties incorporating this language, see O. Ogunbanwo, *International Law and Outer Space Activities*, 1975; F. Nozari, *The Law of Outer Space*, 1973; Fasan, "The Meaning of the Term 'Mankind' in Space Legal Language", 2 *Journal of Space Law* 125, 1974.
19. It is inexcusable and bewildering that after securing language requiring space powers to include the Third World in their space activities, the developing countries have failed to demand compliance with these agreements.
20. One route to explore is to create favorable conditions for aerospace manufacturers to build plants in African countries. These companies could be relieved from paying taxes and tariffs in exchange for providing some of their output to AFRISPACE at a nominal cost.
21. H.G. Wells, 1903.