

SPACE AS A BATTLEFIELD

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Space is now getting overcrowded with man made objects which could be hazardous. Today more than 7000 satellites, 12,000 pieces of scientific debris of varying shapes and sizes and 50,000 odd composite materials like screws, wire and nails orbiting at varying heights inhabit it. The number of satellites and debris could possibly double by the end of the century. All this poses threats to space missions and accordingly, space brooms are being designed to remove this debris by means of containers launched on rockets or from space stations, which could then be burnt up on their way down in atmosphere or brought down on to the oceans for deposit or disposal.

In this milieu, some interesting questions arise. For instance, would there ever be a space battle or a conflict, if so, will the winner in this conflict be in a position to dictate terms on earth? What are the emerging space goals of various countries; in what manner are the armed forces supported by satellites and are any anti-satellite weapons being designed to destroy suspicious and hostile satellites which sneak over a country?

THE QUESTION OF SPACE CONFLICT

Emerging space technologies and current achievements concerning satellites, space stations, space laboratories and anti-satellite weapons give a fairly reliable indication, that the capability to fight a space battle will be there by the end of this century if not earlier. Strictly from the military point of view, it will be a historic event, possibly an unpleasant one whenever this does take place. Also, the new space capabilities may bring many changes in military thinking of a nature one may not be able to speculate clearly. But considering that three fourths of the satellites so far launched are meant for military purposes; that 80% of the signals being generated by these are for intelligence, command and control and other military tasks like reconnaissance, military establishments have legitimate reasons for grave embarrassment in case their locations, barracks, logistic installations, headquarters, training exercises, firing ranges, weapon trials, troop movements, roads and railways and so on can be indicated with pin point accuracy: a capability which is already there and is being further streamlined. No country can afford to be bared in this 'transparency revolution' from the new high ground in Space.

In future, this capability would increase with the launching of space telescopes, orbitors deployed directly from the space stations and diverse types of

Elint (electronic intelligence) eaves-dropping gadgets, thus fomenting additional suspicions. Then Space has no boundaries. A country with space capability could therefore obtain and pass on sensitive information to the concerned party in the opposing block. The Super-Powers are accordingly well on their way towards finalising anti-satellite weapons so as to be in a position to deal with such situations. So it can therefore be expressly stated, that the seeds of a space conflict are already there inspite of the professed intentions to use Space only for peaceful purposes.

With emerging technologies, when more countries acquire space capability, the chances of a conflict can only increase and not diminish. Also, Space offers an alternative to a nuclear conflict. The EMP (electro magnetic impulse) generated due to a nuclear explosion in atmosphere will damage and render the parts of friendly as well as hostile satellites obsolete. Therefore in a way, Space would help nations to fight a battle and settle scores far away in remote areas from our civilisation, where the conflict would only be seen or visible on TV screens. And most of the population in a country would never get to know as to what exactly happened!

THE WINNER IN SPACE

It is being said and increasingly debated, that the country which dominates Space will also dominate the earth. The statement can be contested because space gadgets cannot remain indefinitely or independently in Space, entirely free of ground support! They need fuel, engineers, signal communications, air fields or space ports to land and take off. They are not self sufficient and have to be replenished periodically. Accordingly, they would remain dependent on support from earth till such time as a base is established on the Moon or Mars, which in the coming decades would in any case remain in the realm of science fiction. Nevertheless, the support systems from Space offer an endless plethora of options for the armed forces.

For all intents and purposes, Space is an open flank. And whosoever dominates this flank will exercise considerable influence on earth. Accordingly, the race by Super-Powers to dominate this flank. The successful country will be in a position to ensure unchallenged access to orbits, it will be in a position to challenge hostile Space satellites like Elin (electronic intelligence), early warning, communication, weather, and ocean surveillance satellites. Therefore it is really in the freedom to use such facilities, that there is scope and power to dominate the earth. Inspite of this, there should be no doubt that in future, space power will be as important as air power has been so far and perhaps much more. Countries which are not space power would in any case remain helpless spectators. The winner in a space conflict would certainly dominate them.

EMERGING SPACE GOALS

As most of the earth has already been explored, quite logically, countries have turned to space exploration as their next objective. Space philosophies are accordingly being discussed and planned with two cardinal objectives; to ensure military security and to establish commercial and industrial enterprises. Therefore, before the year 2000, it would be hard to imagine a world without diverse types of satellites, space monitors and remote sensors to spot mineral deposits, droughts and incipient floods. The American goals centre on a desire to gain prestige in view of the earlier set backs they had suffered in the 1960s. They would like the other countries to associate with them. They consider that ultimately, a base on the Moon would establish them as the leaders in Space. Accordingly, they are contemplating to establish a base on the Moon between 2005-2010 and perhaps later, a post on Mars.

In this context, therefore, a space shuttle (for transportation), a space station (really a depot in orbit for assembling long and short term projects) and ultimately a base on the Moon are being thought of. They are going in a big way to encourage the future generations to study cosmos, space law, earth observation, remote sensing and many other subjects connected with Space and to produce a large number of space graduates and engineers.

The Soviets are of course the leaders in Space today. From whatever is known they seem to be going in for an extended activity using automatic docking satellites with their Space station Mir. The switching of crews in space stations, it appears, would become a routine and the plans for industrialisation of space would also continue at an increased pitch. There are plans to carry out detailed studies of Mars and other planets. Britain has included the study of microgravity in addition to earth observation programmes. They are also engaged in several joint projects with NASA for a Space station, the Space telescope and a Gamma Ray observatory in Space. Canada has a number of interesting programmes: Sarsat (a search and a rescue satellite programme), Space transportation system, Msat (a project designed to put the users in instant touch from a ship, bicycle or while on foot through satellites), Radarsat (for early warning of droughts and floods, and Paxsat concept (designed to study the intentions of other satellites in Space).

Australia, China and Japan have interesting programmes too. The Chinese are planning to offer low cost launch facilities along with insurance cover and Australia is in the process of establishing a Space port. Japanese have a national Space Agency and were the fourth country to launch a satellite. By the end of this decade, a major success which should emerge is in connection with Space transportation systems for conveyance of pay-loads to

orbits. However, this is and can be only a brief glimpse of what is happening or being thought of by some of the countries.

SATELLITES AND ANTI-SATELLITE WEAPONS

Broadly, the eight types of satellites being used today can be categorised into: photo reconnaissance, electronic intelligence (Elint), ocean surveillance, communication, early warning, navigation, meteorological and geodetic. Photo reconnaissance is a vast subject by itself, but the purpose is quite clear, it gives an ability to look down on the enemy with relative safety. As regards Elint, there is little known publicity about this type of intelligence gathering when applied to Space based systems. These can generally be described as those systems which are involved in gathering information about missile tests, radar signatures, and general radio traffic. Ocean surveillance satellites are designed to watch the enemy fleets by using radar and sensors.

The job of communication and early warning satellites though essential is a peaceful one. Navigation satellites help to find and fix one's position more accurately than the stars by corelating the radio signals from several orbiting satellites. With their help a submarine or an aircraft would always know as to where it is. While weather satellites help acquire speedy information of weather. And Geodesy satellites are designed to map the earth's gravitational field and also for increasing ICBM accuracy.

Anti satellite systems are being designed to destroy those satellites which are posing a threat or are just sneaking around in Space over a country with hostile intentions. As satellite capabilities increase, powers using them become more dependent on them. Chain reaction in turn ends up in suspicion about intentions, thus laying the basis for anti-satellite weapons.

A satellite has four components: the satellite, a ground station, the user and communication links. The destruction or disruption of any one of these will negate the usefulness of the system. On the other hand, the system designed to kill a satellite has several elements for: selection of the target and tracking, the booster or launcher for launching the weapon and the weapon itself. Again, should any of the elements fail, then the entire system fails. The two Super-Powers have designed different systems to suit their technologies and requirements. The Soviets have a direct ascent co-orbital satellite (tested in the late sixties) system. While the Americans have a direct ascent IR Homing F-15 aircraft with an MHV (Miniature Homing Vehicle) mounted on it. The Soviet Hunter Killer satellite explodes on getting close to the suspected satellite. In the American ASAT system, the aircraft guides the device (MHV) to Space, which then locates the target with its sensors, separates from the aircraft and rams into the targets satellite. But one of the

genuine difficulties of Space weapons continues to be the problem of distinguishing between decoys and real threats - between scientific and military payloads.

CONLUSION

No one will disagree that a weapon free Space can help serve a large number of activities for the welfare of mankind such as manufacture of medicines, drugs and vaccines, electronic materials, electricity generation, mining of the Moon and nearby planets and perhaps in establishing our first contact with other civilisations. But this is at best a pipe dream. The history of mankind has never been free of wars. As mentioned, the seeds of a space conflict are already there. But the developments for human welfare will take place in Space inspite of developments for warfare as these have done on earth. Therefore those who talk of a peaceful space environment as a prerequisite, show a lack of historical perspective. The reality is that the support from the space systems to the armed forces on earth will be a threat by itself. And because it is so, there will be no option but to deny and if necessary, destroy these threats.