



# MARITIMES

A CAMPUS NEWS SERVER

October '12

2 Rendezvous with  
Col. G. P. Krishnamurthy (Retd.)

8 Nav Tech

11 Icebreakers

## From the Editor...

Grit and determination can overcome all odds. Strength and will power are all that matter in the real world. Courage in the face of overwhelming opposition is what everyone must stand up for. Pride, Honour and Dignity are priceless and should never be compromised with. On this note, I would like to introduce the October issue of Maritimes. Inside you will find an interview with Col. G. P. Krishnamurthy. (Retd.) A new section where we have showcased some of the most powerful warships in the Indian Navy and last but not the least, an article about Icebreakers, ships built to withstand extreme punishment while carving their way through the thickest layers of ice found on the high seas.

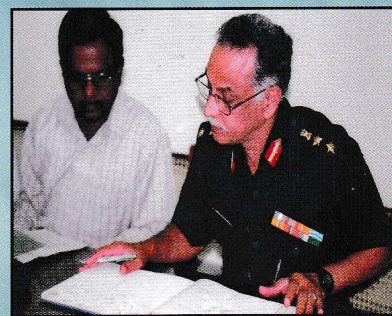
Bon Appetite!

Alakshendra Joshi

# Rendezvous with Col. G.P. Krishnamurthy(Retd.)

Tushar Raj

It was a promising cold day of November 28, 1949, and the clocks were striking seven and a half. The sky above the town was the colour of television, tuned to a dead channel. At that moment, a boy was born with a gift of laughter and a sense that the world rewards to only those who possess utter wit and grit in all walks of life. As the boy grew older, he continued to craft his life's dreams flawlessly into reality with perseverance, dedication and infinite enthusiasm. Recently, in a tête-à-tête with this, 63 years old jovial man, recognized as Colonel Krishnamurthy (nick-named as Prof. RAC and Mr. Calm-N-Cool), Maritimes toiled to unravel his God-gifted hearty personality.



## 1) A versatile genius, an austere army officer and a prominent professor. Sir, where did the journey begin?

I was born in Calicut (Kerala), but most of my childhood was spent in Chennai (TN). I did my schooling from St. George School and subsequently, secured my diploma in Mechanical Engineering from Central Polytechnic in Chennai only. (*beckons*)

## 2) How did you get where you are today?

After my diploma, I was offered a job by BHEL (Trichy); and I accepted. While doing my job, I applied for Short Service Commission and was selected in 1971. Thenceforth, I underwent a training of 11 months in Officers Training Academy (OTA) in Chennai and later, joined army. I served our country across its length and breadth and was also a part of team for 'Army Desert Trek Expedition' in 1982 and for 3<sup>rd</sup> and 4<sup>th</sup> 'Antarctica Expedition' in 1983-84 and 1984-85 respectively. In the meanwhile, I got married in 1982. I was promoted to Lt. Colonel and Colonel in 1982 and 1988 specifically. I left army in 2008 and my passion for learning and teaching brought me to TMI in the year 2010. By the way, I take 'Geometrical Drawing' and 'Refrigeration and Air Conditioning (RAC)' courses in the college.

## 3) Sir, please enlighten us by sharing your experience in Antarctica.

As I said, I was a part of the team for 3<sup>rd</sup> and 4<sup>th</sup> Indian Scientific Expeditions to Antarctica. It were meant for carrying out scientific investigations covering subjects like geophysics, geology, microbiology, meteorology, polymer chemistry, et cetera. It all started with the launching of the first Expedition during 1981-82 and all the expeditions created landmarks in India's efforts to reveal the mysteries of the frozen continent. (*gesticulates*)

An 'Ice Class 1A Super Ship', M. S. Finn polaris, from Finn Lines of Finland was chartered for both our expeditions. In the third one, we accomplished all the tasks assigned to us, including the establishment of the permanent station 'Dakshin Gangotri', in a record time of 8 weeks (*grins*).

In the 4<sup>th</sup> Expedition, we built a small summer station, 'Maitri', near the permanent station. In addition, we also set up a High Frequency (HF) communication link between Dakshin Gangotri and India.

Lastly, it is gratifying to note that the 3<sup>rd</sup> and 4<sup>th</sup> Indian Expedition to Antarctica met with complete success, in spite of inhospitable conditions, several problems and setbacks, due to hard and committed team work.

## 4) What do you like the most about your Army career?

Army career offers you unimaginable adventurous life along with a golden opportunity to visit places which are normally not possible for civilians to visit. This is the thing that always fascinates me throughout my life.

## 5) What hobbies do you pursue to live a balanced life?



My hobbies are to listen to Reggae music by Bob Marley, old Hindi songs by Shamshad Begum and Saxophone by Fausto Papetti. And, as far as the sport activities are concerned, I play football and basketball pretty well (*titters*). I'm also fond of dogs and whenever I got leisure time, I used to play with my Dalmatian dog; unfortunately, he is no more! (*saddens*)

## 6) What was the happiest moment of your life?

When I was selected in OTA(1971) and for two consecutive scientific expeditions to Antarctica. (*smiles*)

**7) What dreams and goals inspired you to succeed?**

I always dreamt to excel in whatever I do. I'm also fond of adventures and trekking. Perhaps, this might have inspired me to succeed.



**8) Who has been the biggest influence on your life? What lessons did that person teach you?**

Actually, the list is endless and it would be injustice not to tell each and every name. However, the three great persons who influenced my life to a massive extent are Martin Luther King, Baba Amte and Mother Teresa. They taught me humanity and humbleness.

**9) Sir, what is the difference between being alive and truly living?**

In simple words, truly living is enjoying each and every moment of your life (whether good or bad) and whatever you do. And, just being alive is living your life with no ambitions and principles, deprive of enjoyment and happiness.

**10) If we learn from our mistakes, why are we always so afraid to make a mistake?**

*(articulates)* Mistakes are the facts of life. We often try, and sometimes we fail, it doesn't matter; but lastly we learn from it. I don't think anybody ever fails: actually, s/he has just found another way that doesn't work. So, we shouldn't be afraid to try new things because in my opinion, the person who makes no mistakes doesn't usually make anything different and new in life.

**11) If life is so short, why do we do so many things we don't like and like so many things we don't do?**

Nice question! Take it this way, life is a matter of choices. Agreed? Ok, now in some phases of our lives, we make some of our lives' most important decisions based upon the chances and constraints available at that time. But, as our lives move on-circumstances, opportunities and our attitudes witness a lot of changes. In short, we change. And, we think that we could be the one who we wanted to be once, if only we had made that decision in the past in some other way. Finally, we do so many things we don't like and like so many things we don't do.

**12) What is the one thing you'd most like to change about the world?**

The tendency of people to cut trees mercilessly for urbanization is the one thing I'd most like to alter.

**13) If happiness was the national currency, what kind of work would make you rich?**

My enjoyment towards my work, I hope. *(shrugs)*

**14) Stealing is immoral, right? But, what if stealing is the only way to feed a starving child?**

As an answer to your query, firstly, I don't want that situation should ever come to me. But, if it happens, then there is other way to do so- that is by doing hard work and earning meal for him/her. Remember, stealing is never the only way and it never will be!

**15) What is something many people mistakenly assume about you?**

This one is really a good question *(chuckles)*. As a matter of fact, most people on seeing my moustache and thinking that I'm a Colonel, usually come to a fast conclusion that I'm harsh and difficult to get along. On the contrary, I'm happy go lucky! *(winks)*

**16) What rule of life should never be broken?**

Truthfulness, for sure. Because, it is the foremost of all human virtues.



**17) What is something that is truly unpredictable?**

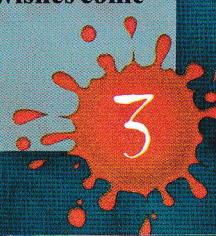
Obviously, our mother nature; no doubt about it.

**18) What does the child inside you long for?**

The child inside me always wants to be one with nature *(smiles)*.

**19) Sir, now a sixty-four-dollar question. If God can make your three wishes come true, what three wishes would you like to be granted?**

My three wishes would be-



- (a) Free the world from poverty and borders (national as well as religious).  
 (b) Bless the Mother Earth with endless natural resources so that even the greed of mankind won't be able to upset the ecology by its rapid consumption.  
 (c) And, I'd like to have my pet dog, Pepper, back because he was the only one who gave me unconditional love and affection.

**20) What are the three key books you feel we should read, and why?**

The three well written and absorbing books, I'd like to suggest to you are-

- (a) Mein Kampf (by Adolf Hitler)  
 (b) Made in Japan (by Akio Morita)  
 (c) An Autobiography of Lee Iacocca

**21) Sir, please enlighten us by the words of wisdom that you'd like to pass along to us?**

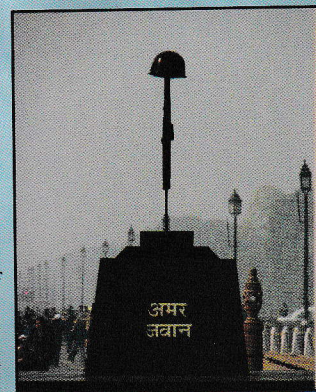
You must enjoy whatever you do. If you don't enjoy, then learn to enjoy it. Because, your little negligence and unwillingness can turn you into a negative-energy-powerhouse. Ultimately, making your and others' lives miserable. Moreover, good luck for future. (*guffaws*)

## Independence Day

-Md. Zeeshan Ali

On the Independence Day, we remember the sacrifices that have been made for our freedom. It lets us remember that India is not defined only by politicians who run it, but the people who love it. As truly said by Patrick Henry- "I know not what course others may take; but as for me, give me liberty or give me death!"

The cadets of TMI marched towards the Twin Basketball Court at 8:30 am with sheer patriotism in their hearts. The 65<sup>th</sup> Independence Day was celebrated in a simple, yet sweet and significant way in the college. This was the first official festive gathering of all the cadets and the faculty members in this new semester. In the absence of the Chief Guest, it was none other than our provost, Capt. Raj Razdan, who hoisted the tricolor with his true spirit of national pride. This morning imbibed a feeling of patriotism and optimism in the minds of each and every person present there.



Capt. Razdan concluded the Flag Hoisting Ceremony with inspiring words, and some patriotic phrases. Indeed, the Independence Day in TMI triggered a new sense of hope and freshness in the heart of every individual that attended that ceremony.

## Janmashtami

-Himanshu

**JANMASHTAMI'**- when we hear this pious word, our minds get enticed with the alluring thoughts of a beautiful & naughty little azure boy, LORD KRISHNA. He was the one who mesmerized the whole universe with his greatness & simplicity. Hindus usually celebrate Janmashtmi by fasting and staying up until midnight, the time when Krishna is believed to have been born. Images of Krishna's infancy are placed in swings and cradles in temples and homes. At midnight, devotees get around to sing devotional songs, dance and exchange gifts. Some temples also conduct the reading of the Hindu religious scripture, the Bhagavad Gita.



C.H.R.D. club decided that it would be an honour to celebrate the birthday of Lord Krishna, along with the villagers living nearby. The preparations began well in advance and 15<sup>th</sup> August was the day decided to carry out the auspicious event. The program started with an enlightening speech by Mr. Nilesch (B.E., SIT college, Pune) mentioning about the pastimes of the lord.

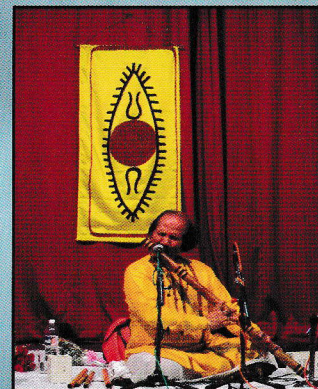
Subsequently, the cadets presented a skit showing an effective method to control our minds by Mantra Meditation. This was followed by Puja & offering prayers (Aarti) to the almighty God. The sacred celebration ended with the distribution of Prasad to everyone present there.

The club would like to acknowledge the presence of Dr. Sanjeet Kanungo, Mr. N.K. Mishra, Mr. Mahesh Shinde and Mr. Anil Patil. We would also like to thank the college administration for granting us permission to organize the programme.

# Spicmacay

-Faheem Sawant

Every year the Institute organizes various cultural events. One of them was 'SPIC MACAY' which TMI hosted on 27<sup>th</sup> of August. SPIC MACAY is an organisation which seeks to conserve and promote awareness of the rich and heterogeneous cultural tapestry amongst the youth. This is achieved through focus on classical arts with their accomplished legends. The ceremony commenced in the Auditorium with the felicitation of one of India's ace flutist, Pandit Ronu Muzumdar. He was accompanied by his son Siddharth and Shri Ramdas Palsule on the tabla. The instrument used by Pt. Ronu was his self-designed innovation – a typical 3 1/2 flute famously known as "The Shankh Bansuri". The crowd was spellbound when he began with a powerhouse performance. A slow and steady development of pace took place in his *Raga*. The extravagant display of creativity continued with Shri Ramdas Palsule joining the flow of notes. The versatile tabla player and an accomplished soloist was a perfect companion to Pt. Ronu. The rhythm, tone and harmonization was flawless. The upflow of notes went on, as Pt. Ronu gave a tribute to the people of Kashmir in a perfectly artistic manner. The ceremony ended on a high note with the team playing "Vande Mataram" which induced a patriotic feel within everyone. The Provost thanked the artists and assured them that next time, the event will be held on a larger scale. The Institute ardently appreciates their talent and surely we will enjoy such performances for years to come.



# The Fresher's Cup

-Syed Ameer Humza

Every year a fresh batch of students join TMI - some nervous, some wary of staying away from their home and almost all having their shoulders heavily laden with expectations. To remove this feeling and make them feel more at home, TMI hosts 'The Fresher's Cup', where a few major sports are selected for them to compete against each other and win the coveted cup for their house.

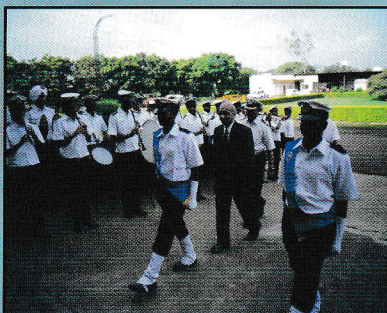
Among all the sports played, Football gathered the largest audience, unofficially declaring the cadets love for the game. All the four houses were grouped into two teams of seven each, to give maximum opportunity to everyone. The matches were a cracker from the word 'go' as each and every team was at its best. With the number of goals scored in a particular match reaching seven, defense was clearly not in their dictionary as each team continuously tried to hammer the other.

The final was played between Mudaliar and Master house. Although facing a tough competition in the first half, Mudaliar strikers finally led their house to victory with a convincing 3-1 win.

# Epaulette Ceremony

-Hiten Parmar

On the day of 12<sup>th</sup> September 2012, the first years of TMI agreed upon to take the challenging responsibility on their shoulders and start their career. The Chief Guest for the event was Capt. Kothurkar, former Capt. Superintendent of T S Rajendra. All the cadets were very excited for this event and the band performed in full gusto. The event was awe-inspiring for the first years. The unveiling of their epaulettes was followed by the Pledge of TMI. At the end, the teachers motivated the cadets to face the tough life of a mariner.



# Inter House Marchpast

-Md. Zeeshan Ali

7<sup>th</sup> September marked the beginning of the Sports session and the Inter House March-past was the first event that took place. Excitement was gushing in the veins of each and every cadet. All houses gave their best performance in their respective house uniform.

The House Cadet Captains and the Institute Cadet Captain took an oath to follow the rules and endow the spirit of sportsmanship throughout the upcoming sports session 2012-13.

The audience comprised of cadets, Principal Dr. B.K.Saxena, Capt.R.Razdan, Mr.I.K.Basu and the faculty and staff of TMI. Two senior officers from Fleet Management, Mr. Sanjay Chandra and Capt. Sudarshan, were the chief guests.

Akshay Shetty of Master house received the best sportsman award for the year 2011-12. Displaying great coordination and determination, Cassim house was declared the winner of the event. Let's not forget about the band party, which performed splendidly in their black and white uniform, marching fabulously on the tracks.

The final house standings were as follows:

1. Cassim
2. Morarjee, Master (Tie)
3. Mudaliar

# Freshers' Basketball Tournament

-Saumya Singh

The freshers' cup for basketball was held from 14<sup>th</sup> August till 21<sup>st</sup> August. A total of 8 teams participated- two from each house. The tournament was held on a knockout basis. Despite bad weather conditions, the zeal and enthusiasm of the players and the audience was not deterred. The crowd turned up in huge number to watch and cheer for their teams and the sportsmanship was impeccable.

Morarjee and Mudaliar reached the finals and a fierce competition ensued. Mudaliar house emerged victorious despite being given tough resistance by Morarjee house. The most noticeable and promising player in the entire tournament was Niraj from Mudaliar house who was awarded the best player of the tournament.

# Inter House Football Tournament

-Arshad Ansari

The Inter-House Football Tournament was held from the 7<sup>th</sup> of September to the 17<sup>th</sup> of September. Each house had two teams playing for the coveted cup namely A team and B team. The initial stages of the tournament witnessed league matches being played in order to decide which team would face off in the semi finals and finals respectively. The tournament saw some spectacular goals being scored and exemplary passes being made. Competition was tough, no doubt, with the players giving it everything they had. For the audience it was nothing less than a pure adrenaline rush and the cheering was deafening.

The finals of the two categories was nail biting till the end with the crowd waiting with bated breath so as to see who would emerge victorious and take away the glory. In the end, Mudaliar House won the final match in the A team category; whilst Morarjee House was the winner in the B Team category.

The overall house standings were as follows:

- 1) Morarjee
- 2) Mudaliar
- 3) Cassim
- 4) Master



# Let Your Racquet Do The Talking!

-Tushar Raj

“When I'm playing Badminton, there are only two people in the world-myself and my opponent.” These words uttered by Erland Kops, former Badminton Champion from Denmark, shows how persistence and determination leads to the pinnacle of success. Erland's statement was flawlessly redefined by TMI cadets with extreme precision and sportsmanship from June 18 to June 25 as Inter-house Badminton Tournament 2012, electrified the whole campus with its advancement.

Badminton, as we all know, is one of the world's most popular sports that has been the subject of fierce international competition for centuries. Undoubtedly, being a quick-paced sport, it requires fast reflexes, steady concentration and extraordinary hand-eye coordination. And these requirements were impeccably fulfilled by TMI shuttlers as a result of their tough net practices throughout the semesters.

As the tournament proceeded, almost all of its matches turned out to be thrilling and full of deception. Few obvious reasons were players' skills at faking left when they were shooting right and vice-versa; or, hitting the shuttle soft and short when they leaped high and looked as if they were going to pummel it long. Furthermore, the Finals proved to be the matches of brute force and deft touch, with the bird traveling at more than 150 mph after an overhead smash and at the pace of a crawl when dinked over the net. The spectators were in something close to frenzy, while the players-because of nerves, exhaustion and eagerness to win-were longing for victories over their opponents as quick as possible.

Ultimately, the championship ended in close wins and losses by slight margins. Being the Chief Guest, Prof. D. D. Mundhra, bestowed the players and the elite ones were -

Best Player Singles- Deep Chitale (MOR)

Best Players Doubles- Aditya Joglekar and Sagar Dabral (MUD)

Best Players Mixed Doubles- Jannat Bhuller and Akshay Shetty (MAS)

In a nutshell, the overall house standings were-

- 1- Mudaliar
- 2- Master
- 3- Cassim
- 4- Morarjee

Even more, the tough competition continued like past years, and it appears, it will continue ever!



## Inter House Squash Tournament

-Faheem Sawant

The high speed racquet sport, a.k.a “Jet Propelled Chess”, was played in the well maintained four walled courts of TMI. Each team comprised of seven members ( five playing and two extras ). First on court to play in the semi finals were Cassim and Morarjee. The organized Cassim team showed its intention right from the beginning. Admirable backhands were played and soon they put the pressure on their opponents. With a collective effort, they advanced onto the finals. On the other side of the draw, the players of Mudaliar performed superbly showing great speed and agility. At first it seemed as though it was an evenly matched final between Mudaliar and Cassim. But very soon Cassim's pace proved too much for Mudaliar. Cassim clinched victory winning the finals 3 – 1. Courageous efforts were shown by Cheema Mehtab ( Presea Cadet from Cassim ) who was also bestowed with the best player award. Equal amount of zeal and enthusiasm was shown by Aditi Khilnani ( Best player female category ), Chirag Singh Shekhawat and Aditya Joglekar. It's always pleasing to see cadets enjoying themselves and participating actively in such sports. For those who have keen interest in learning this game, you are always welcome on the court.

# Nav Tech

## • DELHI CLASS, INDIA

-Adil Malik

Three Delhi Class destroyers were built for the Indian Navy by Mazagon Dock based in Mumbai, under the Project 15 programme. The Delhi destroyer was designed by the Indian Navy with a detailed and production design phase carried out by Mazagon Dock. INS Delhi was commissioned in 1997, INS Mysore in June, 1999 and INS Mumbai (formerly Bombay) in January, 2001.

With a displacement of 6,700t, overall length of 163m and beam of 17m, the Delhi Class is the largest warship built in India. The ship is fitted with sophisticated anti-ship, anti-aircraft and anti-submarine sensor and weapon systems.

### Weapons

The ship's integrated combat data system is supplied by Bharat Electronics Ltd (BEL) of Hyderabad.

The main gun at the bow of the ship is a 100mm gun supplied by Russia. The ship is also fitted with four six-barrel AK 650 gatling guns.

The ship is equipped with four quad launchers for the Uran anti-ship missile system. The Uran system launches the Kh-35 (Nato designation SS-N-25) antiship cruise missile, which uses an inertial guidance system to steer the missile towards the target area and an active radar homing head for terminal guidance. The minimum and maximum ranges of the missile are 5km and 130km.

INS Delhi, INS Mysore and INS Mumbai are fitted with the Rafael Barak point air defence missile system. Barak has an eight-cell vertical launch system and the missile command-to-line-of-sight (CLOS) radar guidance with a range from 500m to 10km. INS Mumbai is being fitted with the missile system.

The Type 15 destroyers will be modified to equip with BrahMos supersonic cruise missiles. BrahMos is developed by BrahMos Aerospace, a joint venture of Defence Research and Development Organisation (DRDO) of India and the Federal State Unitary Enterprise NPO Mashinostroyeniya (NPOM) of Russia.

The ship has a quintuple 533mm torpedo launcher which can also be used to launch SS-N-15 Starfish or possibly SS-N-16 Stallion ASW missiles. SS-N-15 has a maximum range of 50km, SS-N-16 of 120km.

The ship also has two RBU-6000 anti-submarine rocket launchers with 12 tubes. Range is 6km and the maximum engagement depth is 500m.

The ship's radar suite includes Rashmi I-band navigation radar by Bharat Electronics, Russian Kite Screech and Bass Tilt H,I and J band fire control radars for the guns, Garfun B fire control radar for the Kh-35 Uran SSM, Front Dome fire control radar for the SA-N-17 SAM, RALW - LW08 air search radar operating in D-band and supplied by Bharat Electronics Ltd and Thales Nederland (formerly Signaal) and the Bharat / Thales RAWS - DA05 E-band surface search radar.

The ship's hull mounted active search sonar capability is based on the TSM2633 by Thales Underwater Systems or the APSOH by Bharat.

The Delhi Class also has a variable depth sonar, Model 15-750 developed and manufactured in India by Indal and Garden Reach.

### Propulsion

The ship's propulsion is based on a combined diesel and gas CODAG system. The Russian gas turbine system is the AM-50. The KVM-18 diesel motors are supplied by Bergen and Garden Reach. The propulsion system drives two shafts and provides a maximum speed of 28kt.



## • TALWAR

-Rohit Bhalla

The Talwar class guided missile frigate is a modified Krivak III class frigate in service with the Indian Navy. Built by Baltiysky Zavod, the frigate supports naval forces during air, surface and sub-surface missions. It is also used to detect and destroy enemy submarines and other surface ships.

The first and second frigates in the class, the INS Talwar and INS Trishul, were commissioned in June, 2003. The INS Talwar was commissioned in April 2004.

In July 2006, the Indian Government signed a \$1.6bn contract with Yantar shipyard for an additional three frigates.

The first of three frigates, INS Teg (F45), was launched in November, 2009. INS Tarkash (F46), the second, was floated out in June, 2010 and the last frigate, INS Trikand (F50), was launched in May, 2011.

The new frigates will be armed with eight BrahMos supersonic cruise missiles instead of 3M-54E Klub-N anti-ship missiles. The ships will be delivered between 2011 and 2012.

### **Talwar design**

The Talwar was designed by Severnoye Design Bureau. The topside and hull sections were redesigned to reduce radar cross-section, electromagnetic, acoustic and infrared signatures. The hull features an outward flare and the superstructure features a tumblehome angle. The design also incorporates stealth technologies.

The Talwar is fitted with a Trebovaniye-M combat information and control system. The system integrates eight T-171 full-colour operator workstations and three central T-162 servers. It manages and controls all weapons on board, develops combat missions depending on the situation analysis and transfers the data to the weapon systems.

### **Missiles**

The frigate is armed with an eight-cell 3S14E vertical missile launcher for 3M-54E Klub-N anti-ship missiles. The three-stage missile uses active radar guidance. The Klub-N reaches Mach 2.9 in the terminal stage and has a maximum range of 220km.

The ship is also equipped with a Shtil-1 medium-range surface-to-air missile system. The system can launch SA-N-12 surface-to-air missiles through a 3S-90 missile launcher. A total of 24 missiles are accommodated in a magazine located below deck. The SA-N-12s have a range of 45km and use inertial guidance and semi-active radar homing. In the future, the frigate may be also fitted with Igla-1E portable air defence missiles.

The frigate is fitted with two twin 533mm DTA-53-11356 fixed torpedo tube launchers firing SET-65E / 53-65KE torpedoes. A 12 barrel RBU-6000 anti-submarine warfare rocket can fire 212mm 90R ASW rocket or RGB-60 depth charges.

### **Countermeasures**

The ship's countermeasures package includes a TK-25E-5 integrated electronic warfare suite. The system features an electronic support measures system consisting antenna arrays and a multi-mode jammer. The PK-10 ship-borne decoy dispensing system provides soft-kill defence capability. The system includes four KT-216 decoy launchers and remote control console.

The ship's surface search radar is a 3Ts-25E Garpun-B radar operating at I-band frequency. It uses active and passive channels for long-range surface target designation. A MR-212 / 201-1 navigation radar and a Kelvin Hughes Nucleus-2 6000A radar are installed for short-range navigation and surface surveillance.

The frigate is also equipped with a Ladoga-ME-11356 inertial navigation and stabilisation suite developed by Elektropribor. The Fregat M2EM 3D circular scan radar provides target indication to the Shtil-1 missile system.

The Ratep JSC 5P-10E Puma fire control system integrates a phased array and target tracking radar.

### **Propulsion**

The Talwar class frigates are equipped with combined gas turbine and gas turbine propulsion systems. The M7N.1E gas turbine plant includes two DS-71 cruise turbines and two DT-59 boost turbines.

The turbines are connected to two shafts through two R058 single-speed reduction gearboxes. Four Wartsila WCM-1000 generators and Kirloskar gen sets provide electricity for the vessel.

# Visits

-Mridul Gupta

DATE	NAME OF VISITOR	COMPANY
07-Jul-12	Mr. Abhijat Chahal	TMI Alumnus and General Manager Terminal Partnering & Performance, Asia Pacific liner Operations Cluster, Maersk Line
14-Jul-12	Capt. S.S. Naphade	Former D.G. of Shipping, Former Nautical Advisor to the Govt. of India, Representative JAISU Shipping Co. Pvt. Ltd.
16-Jul-12	Capt. Tim Long	Mgr. Training & Development, Chevron
24-Jul-12	Mr. J Patil	RTO, Pimpri Chinchwad
31-Jul-12	Cmde. P.J. Rangachari	Commanding Officer, INS Shivaji
18-Aug-12	Capt. J. C. Anand	Chairman Emeritus & Adviser, Indian Register of Shipping
	Prof (Dr.) G. Sundar	Deputy Director, Off Campus Programs, BITS, Pilani
22-23 Aug-12	Capt. Prabhat Nigam	ASP Ship Mgt.
	Ms. Suchi Prabhat	
27-Aug-12	Pt. Ronu Muzumdar	Flute Artist
7-Sep-12	Mr. Sanjay Chandra	Fleet Management Ltd.
	Capt. Sudarshan	
12, 13-Sep-12	Mr. CP Paul, Capt. Gupte	NYK Ship Management
12-Sep-12	Capt. Kothurkar	Former Capt. Superintendent of T S Rajendra
15-Sep-12	Prof. Raghuram G.	Vice Chancellor, IMU

# Ganesh Chaturthi

-Animesh Nayak

On the 19th of September 2012, Ganesh Chaturthi was celebrated with great pomp and show in the TMI campus, near the market complex. Provost, Capt. Raj Razdan, faculty members and the institute students participated in the Inaugural Puja. A beautifully decorated idol was installed and the pandal was extensively decorated. Every day, morning and evening Aarti were performed with full participation of cadets and faculty members. The celebrations continued for 10 days till 29th September, 2012. On the evening of 29th September, 2012, Saturday, around 7 pm local time, the procession for the immersion of lord Ganesh was carried out.



# Current Research Trends on Vedic Ganit

-Dr. Bani Upmanyu

Vedic Sutras are used in DSP (Digital Signal Processing), a fastest growing technology that is needed in every engineering discipline. Faster additions and multiplications are of extreme importance in DSP for convolution, discrete Fourier transforms, fast Fourier Transform, digital filters etc.

The core computing process in a processor is always a multiplication routine. Therefore DSP domain engineers are constantly looking for new algorithm and hardware for faster processor. All the leading manufacturers of microprocessors have developed their architectures to be suitable for conventional binary arithmetic methods. Recent research shows that, Vedic sutras provides an efficient and faster multiplication algorithm for microprocessors, resulting in appreciable saving in processing time. According to a study [1], For two digit multiplication, time saving is 59% and for three digit multiplication, it is approximately 42%.

Using Urdhva Triyagbhyam Sutra (Vertically and crosswise) for Discrete linear convolution used for

Discrete linear convolution used for DSP application like imaging , wireless communication etc. , computations were speed up , accurate and efficient [2]. Urdhva Triyagbhyam Sutra is also good for squaring circuits [4]. There is a comparative study for 16 X 16 Vedic Multipliers based on Urdhva Triyagbhyam Sutra and Nikhilam Sutra [3] which concluded that for numbers with more than 16 bit size , Nikhilam Sutra is better than Urdhva Triyagbhyam Sutra.

Further research prospects are on development of a Vedic DSP chip using VLSI technology.

[1] The implementation of Vedic Algorithm in Digital Signal Processing : P.D. Chidgupkar & M.T. Karad (2004)

[2] Speedy Convolution using Vedic Mathematics : Rashmi R. Kulkarni and Prof. Bhasker P.C. (2011)

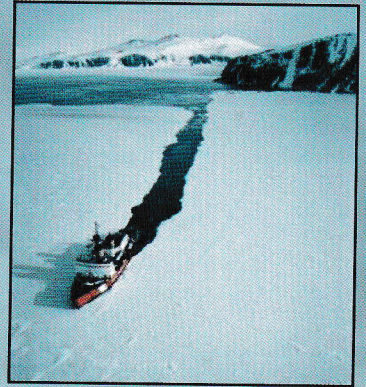
[3] Speed Comparison of 16 X 16 Vedic Multipliers : M. Pradhan, R. Panda, S.K. Sahu (2011)

[4] An improved Squaring Circuit for Binary Numbers : K. Sethi and R Panda (2012)

## Icebreakers

-Kashish Anand

'Icebreaker', a term we, the people associated with the marine fraternity are bound to come across at some point or the other during our careers either out at sea or ashore. We all at our own individual levels have heard titbits about these ships, but we can never fully imagine the vast expanse of these ships' canvass, unless either we have personally sailed on or worked in tandem with one. We'll take you through a venture unravelling the phenomenon of Icebreakers, the magnanimous nuclear powered vessels that perform the herculean task of breaking through the icy waters of the arctics and have thus to an extent facilitated in the progress of the fabled, much sought after North-West Passage.



When the going gets tough, the tough gets going, suits perfectly on an icebreaker, an example of how water navigation is possible even in the toughest of situations. An ice ship is used in extremely cold regions where thick layers of ice are formed on the surface of water. The ice makes the waters inaccessible for other sea-going ships or boats. Ice ship is thus used to break the ice sheet to allow other ships to ply in the region.

The main requirements for a ship to be classed as an ice ship can be explained as follows:

- a strengthened hull
- an ice-clearing shape
- the power to push through ice-covered waters

Constructional Aspects-

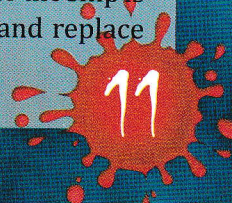
**1. Double hull and watertight compartments:** These provide protection in case of a breach. The ship's hull is thicker than normal, especially at the bow, stern, and waterline, using special steel that has optimum performance at low temperatures.

**2. Optimal ice clearing shape:** A ship with a conventional design cannot be used as ice ship under any circumstances. The optimal shape for moving through ice makes icebreakers uncomfortable in open waters, tend to roll from side to side to the discomfort of the crew; and gives them poor fuel efficiency : almost all of them have thick, rounded keels, and with no protuberances for stability, are likely to roll even in light seas. They are also uncomfortable to travel in when breaking through continuous thick ice due to constant motion, noise, and vibration. Steel is the main equipment used to build the hull and the other parts of the ice breaker ship.

Bow is rounded rather than pointed, allowing the vessel to ride up over the ice, breaking it with the weight of the vessel. No hull appendages vulnerable to ice damage with the rudder and propeller being protected by the shape of the hull.



The propellers and the ballast tanks of an icebreaker are also built and strengthened against the dangers of the ice, are always covered with protective covering. Propellers have specialized coatings at tips and are to be run at all times when navigating through ice irrespective of whether the ship is underway or stopped, also the vessel has the ability to inspect and replace blades while at sea. A modern icebreaker typically has shielded



propellers both at the bow and at the stern, as well as side thrusters; pumps to move water ballast from side to side, all designed to allow an icebreaker stuck amidst thick ice to break free.

**3. Adequate strength:** The ship has to have the strength and power to withstand the pressure of the ice while it is moving ahead in the water and continuously breaking the ice. An icebreaker is powered by gas turbines, diesel-electric powerplant or nuclear energy.

The concept of an ice ship is not a new one, though. It has been in use right from the 11<sup>th</sup> century. However, the technology has developed in the years following and the ice breaker ship evolved from being constructed of plain wood to being operated by steam engine in the 19<sup>th</sup> century. The City Ice Boat No. 1 was the first steam engine powered ice ship that was built in Philadelphia in 1837.

In today's times, the technology has developed to make ice ships propelled through nuclear power. The first ice ship that used nuclear power to break the ice in its route waters was the Soviet ship Lenin in the year 1959. One of the most well-known and successful boat builders who changed the way ice breaker ships were built in Europe was Mikhail Britnev of Russia. He built three famous ships: Pilot (1864), Boy - Russian for Battle - (1875) and Booy - Russian for Buoy - (1889).

Nuclear-powered icebreakers have been escorting vessels in transit between Europe and Asia in convoys in the summer of 2012 as opposed to the previous years when they lead one ship at a time. In 2011, 34 vessels sailed the whole Northern Sea Route. The total cargo transported was 8,20,000 tons.

Icebreakers, an essential requirement of the modern-day shipping industry are needed to keep trade routes open where there are either seasonal or permanent ice conditions and while manufacturing and running an ice breaker ship is a costly process, the usage and efficiency provided by these ships is tremendous. In those areas where trading is impossible without proper water transport, these ice ships help to maintain the continuity in trade and business.



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