# HAM RADIO NEWS

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# ARSI AGM at Kollam Hamfest



## PRESIDENT'S REPORT

The last three months have been quite eventful and fruitful.

ARSI organized the IARU Region 3 Conference in Bangalore, coupled with the IARU Directors meetings. By all accounts the conference was a great success and we received encomiums from many sources. It is satisfying when things go well!!

We have also managed to update our accounts almost completely and the accounts were presented at the AGM in Kollam.

The AGM itself was well attended and many useful discussions took place. One major decision was the methodology to enroll the many individual ham clubs all over India as Club Members of ARSI.

Many of our members were present at the Kollam Hamfest; a very well organized and looked forward to event. The proximity to the Onam festival did reduce the possible number of attendees as many were not able to secure return travel arrangements.

ARSI set up a display table at the Hamfest manned by GC members where information was provided, subscriptions collected and many new members enrolled.

Streamlining our systems is our main priority now and we are making good progress in that direction.

The best news which I received last week was that our efforts to get a permission from WPC to operate from Lakshadweep Islands have borne fruit. We now have permission to operate with the call sign VU7LD for the period 1st Dec. to 31st Dec. 2006.

The ARSI Governing council is committed to have a world class VU7LD operation and request ARSI members who are good operators to come forward to make this very important operation a grand success.

I would like to end by wishing all our members all the very best for Diwali, Christmas and the New Year.

## THE EDITOR SPEAKS

Hello everyone,
I am an extremely happy YL. The event that I have been planning for the past two years is finally round the corner. The International YL Meet is happening between the 26th and 29th of this month at the Hotel Intercontinental Grand, Mumbai. It would be great to catch up with all my YL friends from around the world. The icing on the cake is the fact that I will also be traveling with them on a short tour of India. More details are in this issue.

The other exciting and happy news is that ARSI has permission from the WPC to operate from Lakshadweep for a whole period from 1st-31st December 2006. The governing council of ARSI worked in unision to procure this permission and the WPC was extremely cooperative in guiding us towards this effort.

Now with the permission in hand, we are working towards setting up world class stations at Kavaratti, and a very talented group of operators will be working on the band with the special call VU7LD. Indeed it is a dream come true for ARSI and all hams in India to be able to operate from one of the most wanted prefixes in the hamworld. We request all hams in India and around the world to respond to our call.

The IARU Region 3 was an experience in the serious and official side of hamradio. I realized the immense efforts made by individuals, who keep our frequencies intact. As a delegate from India, it was a first time for me in a ham parliament and I was sometimes very sorry for my inadequacies!!!!

The best result from the IARU meeting was the election of ARSI president VU2GMN, Gopal as one of the directors. India was served well by VU2RCR, Chandru and I am sure Gopal is going to be a great asset to the IARU.

As usual I sign off with an appeal for all to contribute articles and advertisements for the HRN

Keep smiling and be on air,

Sarla

## OFFICE BEARERS

**President : Gopal Madhavan, VU2GMN**
"Shreyas" Apartments, 128 (old 63) Greenways Road,
Chennai - 600 028
LL: +91 44 2493 7724 / 4230 3129 Mobile: +91 94440 18452
E-mail:gopalmadhavan@vsnl.com

**Vice President: Ms Sarla Sharma, VU2SWS**
7,Gaurav Apts, Behind Ashok Nagar, Nahur, Mulund (West),
Mumbai 400 080.
LL: +91 22 25682361 Mobile: +91 98211 66411
E-Mail:sarla_sharma@hotmail.com

**Hon. Secretary: Rajaram K. N., VU2KKZ**
#27, Shrungar Shopping Centre, Mahatma Gandhi Road,
Bangalore - 560 001.
LL: +91 80 2558 6006, 2509 1186 Fax: +91 80 2559 4880
E-mail:secy.arsi@gmail.com

**Treasurer: R. Ramchandra (Chandru), VU2RCR**
No.488, 14th Main, 3rd Block, Koramangala, Bangalore 560 034.
LL: +91 80 2553 6853 E-mail: rcr@vsnl.com

**Editor: Ms. Sarla Sharma**

**QSL Manager: D.P.De, VU2DPD**
45/5 Moore Avenue, Kolkata-700 040. LL: +91 33 24114719.

**QSL Bureau:** P.O.Box 17116, Kolkata -700 033.

**Awards Manager & Monitoring Systems Coordinator :**
**B.L. Manohar, "Arasu" VU2UR,**
MIG-6, 80 Ft. Road, Kengeri Sattelite Town, Bangalore-560 060.

The registered address of the society is
ARSI, P. O. Box No. 3462, Bangalore- 560 034.

All payments to be made to the ARSI (Administrative Office) at Bangalore. Payment should be made by demand draft or cheque to ARSI, payable at Bangalore. For cheque payments please add Rs. 40/-.

Send to:

**K. N. Rajaram VU2KKZ**
**Hon. Secretary**
Amateur Radio Society of India
# 27, Shrungar Shopping Centre
Mahatma Gandhi Road, Bangalore - 560 001.

**W.P.C Address :**

Asst. Wireless Adviser to the Government of India,
Ministry of Communications & Information Technology,
Department of Telecommunications, WPC Wing,
COP Section, 6th Floor, Sanchar Bhavan, No.20,
Ashoka Road, New Delhi 110001.
Mr. Leeladhar D. Meghwal, is the Engineer looking after Amateur Radio matters.
LL: +91 11 2335 5441 Fax: +91 11 2371 6111

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# MINUTES OF THE ARSI AGM

Minutes of the ARSI AGM held at the Hilton Hotel, Thevally, Kollam, On Saturday the 9th September 2006 The meeting was called to order at 1800 Hrs.
The following members were present:
1) VU2SGJ 2) VU2SGQ 3) VU2GMN 4) VU2RCR 5) VU2KKZ 6) VU2GGM 7) VU2AO 8) VU2BVM 9) VU2NKS 10) VU2VQL 11) VU3OJV 12) VU2MTM 13) VU3JBA 14)VU3TGC 15) VU3RSB 16) VU2DRK 17) VU2VAU 18) VU2FI 19) VU2POP 20) VU2RO 21)VU2SDU 22) VU2MKP 23) VU2CTN 24) VU3GEN 25) VU2GUR 26) VU2SWS 27) (VU2UM also attended but he is a non Member)
1) The notice of the meeting was read out by the Secretary VU2KKZ
2) The President VU2GMN welcomed the gathering and apologized for announcing the wrong time of the meeting (1700 hrs instead of 1800 hrs as in the circulated notice resulting in many members having to wait almost an hour till the meeting was called to order).
3) The minutes of the last AGM held in Bangalore, already circulated was taken as read and adopted.
4) VU2KKZ then gave a report on activities during the year, stressing on the aspect of regularizing the paperwork as not much was handed over to the committee from earlier committees
5) VU2RCR then gave the Treasurers report and elaborated on a few points. Queries were raised on accounts for the IARU Region3 Conference- it was clarified that this would be a part of the following year's accounts. It was also pointed out that several members who had paid their subscription were being shown as being due. It was clarified that there was a problem which was being sorted out by appointing a part-time accountant who would go back into bank and other records and make records up-to date. There should be no problem in future.
VU2DRK then proposed that the accounts be adopted, seconded by VU2BVM and passed unanimously
6) The budget for the coming year was then presented by the Treasurer- After a short discussion when it was pointed out that budgets for all events organized by ARSI, even though they were self financing, should form a part of the budget in future. It was then proposed by VU2GEN, seconded by VU3RSB and passed unanimously
7) The President announced that a letter had been received from Chirag Bakshi VU2QBX regarding the method of accounting and the details needed to be provided in the accounts. Action has already been initiated to take care of most of these matters and the appointment of part time help would go a long way to do this. A detailed reply to be sent to Chirag by VU2GMN.
Any Other Matters
8) VU2SWS gave a short report on the plans for the International YL Meet which was planned for November in Mumbai. She stressed the point that all arrangements were being made by an event management company, and the event would also be self financing with no financial support from ARSI.
9) Club Membership - VU2SWS informed members that it was proposed that individual clubs be associated with ARSI by becoming members. She stressed that ARSI would in no way interfere with the functioning or finances of any club, but the club membership of ARSI would give ARSI strength to deal with the various administrations, something that was being required on a much more regular basis nowadays as our frequencies were under siege, licensing needs to be streamlined, and other matters. After a lengthy discussion it was proposed by VU2FI and seconded byVU2MPM, and passed unanimously, that the various local ham clubs in India could become members on the following terms:
a) A club was one which had a minimum of 10 members. b) Annual membership for each club would be Rs.1000.00 with an initial entrance fee of Rs. 100.00. c) Membership entitled to one vote at ARSI meetings and two copies of the HRN magazine. d) Voting by clubs would be by a member nominated in writing by the club before any ARSI meeting. (The question was raised by VU2GGM on whether two votes could be cast by a club nominated representative if he is also a member of ARSI in his own right. It was agreed that we would consult someone on the legality of this and implemented for the future meetings). A nomination form to be circulated along with the notice of AGM. e) If any club member required his individual copy of the HRN and the services of the QSL Bureau, then he would pay an additional Rs. 100.00 per year
10) National Field Day: It was suggested that the concept of an All India Field Day, to be conducted on one nominated day each year, be initiated, details are to be worked out and suggestions to be invited from members.
11) Hill Topping: The Kerala hams suggested that a Hill Topping Exercise be conducted some day in October. The suggestion was accepted and details of the event, rules with points calculation etc would be made available soon and circulated to all members
12) QSL Bureau VU3RSB kindly offered to take care of the QSL Bureau from Hyderabad, as and when VU2DPD found it difficult to run the Bureau. The President thanked VU3RSB for his kind offer which would be looked into at the appropriate time.
13) VU2FI mooted the idea of an Inter-Club annual meeting. Details would be worked out about the feasibility etc.( presumably it would be restricted to office bearers of individual clubs to work out ideas on promoting ham radio and VU2FI to give more details)

(Many of these matters were discussed during the hour before the formal start of the meeting, but taken into the general business of the meeting)

There being no other business the meeting was closed at 1930 Hrs.

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The ARSI has been given permission by the WPC to operate from Lakshadweep islands for the period 1st December to 31st December 2006 with the call sign VU7LD. President ARSI, VU2GMN, OM Gopal will be head of operations with Vice President, ARSI, VU2SWS YL Sarla as team leader and Secretary, ARSI, VU3KKZ OM Raja as manager of the whole operations. ARSI is now busy with formation of teams and other logistics, and and making plans for a world class operation which would make India proud.

Lions Clubs International - Ham Radio Club Station - VU2LCI on invitation from Lions Club of Tirupathi operated a Special Event Station from 15th Sep to 21st Sep with a Special Callsign AT7LEO denoting Amateur Radio Station on Seven Hills "Tirumalai". This was the venue of the Lions District 324 Multiple - Leo office bearers installation function on 16th and 17th September 2006 at Kalyan Residence Hotel, Tirupathi, Chittoor District, Andhra Pradesh State in South India.Presentation of this Hobby of Amateur (Ham) Radio to youngsters 12 to 24 years of age from whole of South India under the banner of Leo Clubs was given. Plans to print Special QSL Card for all the QSOs made with this Station and for SWLs is underway. QSL Manager & Custodian of VU2LCI Lion Ajoy - VU2JHM # 9/1, "Kshitija", Opp Geetanjali, 5-Cross, Malleswaram, BANGALORE-560003 INDIA. Res. Phone +91-80-23442600. Hams at AT7LEO were VU2UR - Manohar (Arasu), VU2LX - Lakshman, VU2POP - Pratap, VU3HDP - Lion Suresh, VU3ICC - Lion Venkatesh and VU2JHM - Lion Ajoy

The Coimbatore Amateur Radio Club is organizing the Radio Sport event AMATEUR RADIO DIRECTION FINDING (ARDF) or FOX HUNT on Monday, the2nd October 2006 in Coimbatore. This is the 6th such event conducted by the club from its inception. This foxhunt to be held on Monday the 2nd October 2006 is for Coimbatore members and other amateur radio operators. The contest will start at 9.00 am and end by 12.00 noon. Details of this event on the next issue of HRN.

VU25URC Field Day Station at Yercaud:As a part of silver jubilee celebrations of the Upagrah Amateur Radio Club (VU2URC) of ISRO Satellite Centre, a field day activity was carried out. A group of 20 people consisting of Six Hams, SWLs, XYLs & Harmonics visited Yercaud during 28th 30th July 2006. A special call sign VU25URC was allotted by WPC for the special event station with the numerals '25' indicating 25 years of fruitful existence of VU2URC.

The field day station was established at RAHMS bungalow at Yercaud. Within hours, the station was established and made QRV on HF, VHF & UHF bands. The activities were carried out in a systematic and professional manner, starting on 28th afternoon and running till 30th afternoon. Regular check-in's into Charminar, Belgaum, Kodai and Thiruchengodu nets were made. The special event station was operated by Mani (VU2WMY), Amal (VU2GDX), Balaji (VU3PZA), Suresh (VU2HNS), Nataraju (VU3GFX), Unni (VU2UCI). Lots of contacts were made on VHF through Kodai repeater. The traffic on this channel kept the new call sign holders busy even after midnight. Lots of DX contacts were also made on HF bands both on voice and digital modes with good signal reports of 59.

Serious 'Ham'ing were also interspaced with many fun games, trekking, sight-seeing etc., Party games like Housie-housie, Tailing the donkey, HAM Quiz, Sudoku, Ball into the bucket etc., kept every one very busy and in good humor. A campfire, which lit the night on 28th, brought enough warmth and excitement to the team. The musical talents exhibited by the little ones were to the best of their abilities in a true professional manner and brought much cheers. The cricket matches played with a mixture of seriousness and fun gave many pleasant and happy moments to cherish later. A guided trekking of the jungle provided the much-needed inspiration to the younger lots towards our duties and responsibilities in preserving forest and wild life. In a nutshell, it was a very pleasant and fruitful event. Upon return and looking back at all that was achieved, one gets a feeling of great satisfaction; a satisfaction of having carried out a wonderful Field Day with lots and lots of fun interwoven in it.

VU2LCI, the ham radio club station of the Lions Club took part in the 3rd Asia Pacific regional Air/ Internet Jamboree (APA JAM) on 5th and 6th August 2006 with Shree Chamundi Scouts Group. This event is hosted by the scouts association of Japan. A special HF and VHF station was set up and operated by the scouts and guides. Special Guest for the occasion was VU2SWS, Vice President of the ARSI.

The event was organised by Lion Ajoy, VU2JHM, ably supported by VU2GUR, OM Guru.

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VU2GUR, OM GURU operating the APA JAM station with the Scouts and Guides

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# INTERNATIONAL NEWS

Members of the Israel Amateur Radio Club are hosting a special event museum station honoring 70 years of radio in that nation. Station 4X4IRS is located in the Holon Gallery of Design & Arts. In addition to hamn radio, there is also a display of a wide collection of old broadcast radios along with a modern FM local radio station.

4X1IRS began its operation on August 15th with the event continuing through September 30th. Most of the operations so far have been on 20 meters CW, SSB and RTTY. QSL via 4X6ZK.

The Israel Amateur Radio Club will activate 4X70R and 4Z70R. This is to commemorate 70 years of broadcasting over station "Kol Israel."

Broadcaster Kol is known world-wide as the Voice of Israel . The ham radio commemorative operation begins at 1600 UTC on October 7th and runs through 2400 UTC on October 21st. Activity will be on 160 through 10 meters using CW, SSB and some digital modes. QSL via 4Z4TL.

Ofcom has announced that lifetime licenses and the reviewed license terms and conditions have been postponed until December 2006.

However, amateur radio licenses will be issued free after 1st October, in accordance with the regulator's earlier promise. If your license is due for renewal after 1st October, you will receive a one-year license validation document as usual from the Radio Licensing Center, but no charge will be made. Ofcom will issue a lifetime license and the revised licensing terms and conditions in December, again without charge.

Free lifetime licenses will be subject to validation at least every five years via the Ofcom web site. For those unable or unwilling to validate their details electronically, it will be possible to send the details by traditional means but a £20 administration fee will be levied.

German Novices class operators are now on the high frequency bands. As of September 1st, German D O prefix stations are allowed to transmit on 1.810 to 1.850 MHz with 100 watts, on 80, 15 and 10 meters also with 100 watts plus VHF on 2 meters and 70 centimeters at 75 watts. German Novices can also experiment up on the 10 GHz band but are limited to a maximum of only with 5 watts P-E-P.

Also getting a face-lift is the German class A license. Its holders now are allowed to transmit on 7.100 to 7.200 MHz with 250 W PEP and on 50 MHz -- 6 meters -- as well.

JARL administration said "YES" to PLC (Power-Line Communication) proposal, which uses 2MHz to 30MHz spectrum, to the Radiowave Regulation Council of MIC (Ministry of Internal Affairs and Communication, aka the Telecom Ministry) of Japan, in their submission of their opinion, dated August 7, 2006, for the Council Meeting held on August 23, 2006, to gather public opinions in Japan among those promote PLC and those who are against PLC.

The document submitted by JARL described that JARL accepted the legal update proposals of approving public operation of PLC submitted by MIC. While the document included a request of the government intervention if any interference issues were raised, the request was attached as a clarification, not the condition, of the approval of PLC. The document was authorized and legally signed by the following three JARL administrative officers, who are responsible for the submitted document.

Shozo Hara, JA1AN, President of JARL, Takenobu Kaieda, JH1HNH, Director and IARU Liaison of JARL, Akikazu Mori, JF1JSP, Director of JARL Technology Laboratory.

No notification to the JARL members had been issued previously, until Mr. Kaieda revealed that JARL said "YES for PLC", at the symposium on technical issues of radio interference issues, sponsored by JARL and the Technology Laboratory, held in Tokyo Ham Fair 2006, on August 20. The symposium ended in a chaos caused by the self-contradictory claim of the JARL officer. JARL administration previously announced that they were AGAINST PLC. Three major movements have already started among JARL members and other people who are against the PLC in Japan, including but not limited among the DXing and contesting communitities in Japan.

Toshikazu Kusano, JA1ELY, will file a petition to say NO to PLC against this JARL administration's position, who also attends the MIC Radiowave Regulation Council and explain his standpoint on this issue. Katsuhiro Kitagawa, JH3PRR, has publicly announced to prove the scientific consequence which PLC would raise in the technology is publicly deployed, and to defeat the supportive arguments to be made by PLC-J (PLC Promoters' Alliance in Japan) and JARL administration on the Radiowave Regulation Council.

Takao Kumagai, JE1CKA, has announced to JARL Director General that he will file a petition and a legal action for the three representatives of JARL administration to immediately resign due to the conflict of interest they raised against the Japanese Radio Amateur community, which is against the bylaws of JARL.

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## SILENT KEY

BRIG. V.M.SUNDARAM VU2SN on was silent key on 2nd June 2006. He was a life member of ARSI

OM Vasu, VU2VZ passed away on 18th September 2006 at his residence at Erode. He was 81. He was active on 40 metres with a QRP transceiver and on VHF with a handy.

OM Dr. John, VE3OGZ(VU2IWW), went silent key in Toronto Canada. He was very active with Indian hams on 20M till the time he had a stroke and became somewhat incapacitated.

VU2HSN, Dr.Hari Singh was silent key at Jaipur on 28th September 2006. He will be sorely missed on the band.

*A hearty welcome to all the delegates*
*of the* International YL Meet *in Mumbai*
*our best wishes to the*
*Amateur Radio Society of India*
*in hosting the conference*

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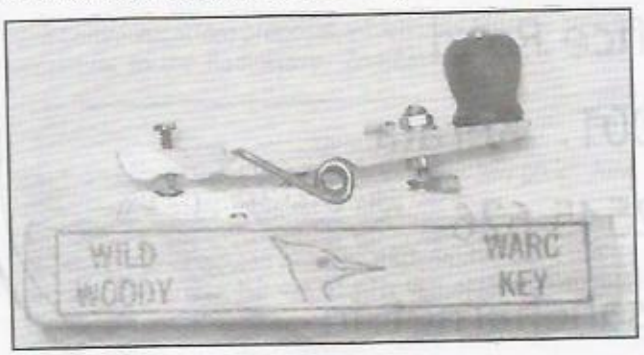
## A Twenty Rupee CPO (or a Five Rupee Morse Key)!

Figure 1: The first prototype assembled by VU2BDX (Bharat)

Figure 2
Inspired by a photograph of QSL Card of "Wild Woody" WARC Key handcrafted by K4TWJ of Birmingham QST August 1994 - the Gurgaon Chapter of ARSI decided to make this cheap and easy do-it-yourself project.




(Original Photograph of "Wild Woody" WARC Key handcrafted by K4TWJ of Birmingham QST August 1994)

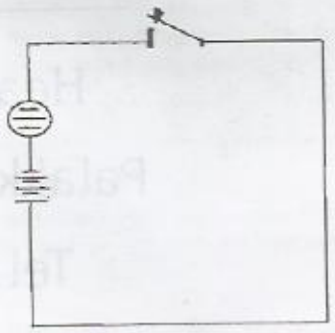
**Intentions were two-fold:**
1.Set the ball rolling for some home brewing activity of Gurgaon Hams; 2.Develop a low-cost alternative that even a 12-year-old child could build. And afford! This was with the long-term 'popularizing amongst school children' objective of the Gurgaon hams.

**Materials Required:**
This has very basic materials found around the house or easily available from neighborhoods shops:
A **wooden base**. Any scrap piece lying around the house free of cost
A **'wooden' clothesline clip** Rs 10/- per dozen. One piece works out to Eighty Paise Only;
**Three small self-tapping screws** Re. 1/-;
First one to hold the clip in place on the base.
The second screw has two functions grip the leg to the base and also the connector tag for one of the leads.
Third, to fix the other lead to the upper terminal.
A **mini buzzer** (Not of the automobile type because they have a 'tail' to the audio) Rs. 10/-; and A **battery holder**, small bits of wire, connector tags and double-sided adhesive tape Rs. 8/

**Construction:**
Construction is as shown in the photographs.
Separate the two legs of the clip from the spring.
Drill two holes - # 1 & 2 - on the leg intended to be fixed to the base. The upper leg has just one hole - # 3. All three holes are as marked and numbered in figure 2.

Screw the lower leg to the base as shown. A tag should be fixed at screw # 2.
Similarly, screw a tag at position 3 in upper leg as shown.
Put back the spring on the lower leg.
Mount the upper leg back to form the clip.
Fix the buzzer and the battery holder with double-sided adhesive tape or any other means. Connect wires as in circuit diagram. The CPO is ready!

**Modifications:**
1.With addition of DPDT switch or 'Stereo' plug and sockets, the key alone can be used for keying QRP Trx.
2.A small size furniture knob may be used additionally to give a 'real-key' feel. Happy hamming!!



*Compiled by: VU2BDX (Bharat)/VU2OEC (Rajesh)*

*A hearty welcome to all the delegates*
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# The International Mumbai YL Meet

The International YL Meet is will be held from the 26th to the 29th of October 2006 at Hotel Intercontinental Grand, Mumbai. It is organized under the aegis of the Amateur Radio Society of India, with VU2SWS, YL Sarla as the convener. It is India's honour to host a meeting of YLs, all of whom are achievers in their own right. It's a pleasure to welcome them to India.

**How it all started and how it evolved**

A group of YLs from around the world met in Hawaii just to have a good eyeball qso. After the meeting they discovered that it was a great idea to meet again, and perhaps somewhere outside of the US. The Swedish YLs offered to arrange a meeting, and we called it YL World. That was the beginning of a series of meetings all around the world. The Meeting in Sweden was held in 1991. It was a great success with YLs from all over the world participating. There was of course a radio station in operation during the meeting, with a special event callsign SK0YL.

The next meeting was held in Osaka in Japan in1993. As before all the YLs from the world attended and were given a taste of Japanese culture and hospitality.

In 1996 it was the turn of the German YLs to arrange the meeting in Berlin from June 20-23rd. Around 168 YLs attended and the excitement was sky high.

1998 saw the Svalbard YLs get into action and the meeting was held from 20th-24th August in Longyearbven, with YLs from 14 different countries participating. It was marathon experience of eyeballing and talking!

In 2002 the YL meeting traveled to Hamilton in New Zealand with the ZL YLs in terrific action. As usual there was great participation from all over the world.

2002 saw the YLs meeting in Sicily island in Italy. That was a great island experience for all the YLs and of course a taste of the culinary and winery expertise of Italy. It was a great getaway from all troubles for the YLs, who had turned up in large numbers from all over the world.

Korean YLs did a fantastic Meeting in 2004 from the 8th to the 12th of October in Seoul. It was a taste of Korean energy for all the YLs from around the world. The Korean Ladies Amateur radio club did a fantastic job and took the event in a fantastic direction.

Now it is India's turn to welcome all the YLs of the world for this meeting. It is going to be an eventful one like all the meetings so far. A special call sign AT6MYL has been sanctioned by the government and a special cover will be released on this occasion by the Principal Chief Post Master General, Maharashtra Circle , Mrs. K. Noorjehan. Shri N.K.Mishra, Director Offshore of the The Oil and Natural Gas Commission of India has kindly consented to be the chief guest of the conference to be held on the 27th of October. All the dx YLs will be staying at the venue hotel and as usual it is going to be a great time for all the old YLs to catch up and the new YLs to make new friends. Around 10 YLs from India will be participating.

Some of the Yl's attending the meeting are:

WD8DQG , Carol, operates from the state of Montana. She has been an been an amateur radio operator since 1975, and holds an Advanced FCC license. She has served as President of the Young Ladies Radio League, Eighth District Chairwoman of YLRL, and is currently the DX-YL Receiving Treasurer of YLRL. She is qrv on 10, 15, 20, 40, and 80 meters phone, and enjoys checking into the YL nets and give out contacts in contests.

F5RPB, Evelyne lives in the south east of France in a little village, SAILLANS, between the Alps and the Rhône Valley. She is licenced since 1991 (the part of CW since 1981!) and enjoys CW and contests very much. Her OM is also a ham, with callsign F5BKU, Georges. She hails from Strasbourg and is a member of the UFT 672 Union Française des télégraphistes, CTC 871 Croatian telegraphy club, CLIPPERTON DX Club CDXC, YLRL , JARL, ALARA, WARO, SYLRA, DLYL's.

7J3AUK , Mie Okamura, ,is licenced since 1986 in Seoul.Korea. Her Korean name is Hyo Sun Kim and her previous callsign was HL1ILD. She enjoys DXing with SSB&CW on 7,14,21,28mh band. She is interested in collecting unique awards in the world. Mie became handicaped by a traffic accident when she was a college student. A person who loved mountain climbing was confined to a wheelchair. In her agony she went into deep depression. During that time she read a book about Mother Teresa, who taught her how precious life really was and ways to live on. 10 years later she could continue to study in a college again and at the same time became a HAM. Through the new hobby she met her Japanese OM, JN3GUV, and lives in Kyoto since 1988. She enjoys singing in chorus and making clay art. From this year she is helping the people who have mental disease as a volunteer. It was her dream to come to India which is fulfilled now.

DL5UF Hilde, is licensed since 1985 was a QSL-manager for 14 years in the local radio club. Together with 2 OMs she did her first DXpedition to the South Pacific. The stations were 5W1, KH8 and A35. In 1990 she was at YJ0 and H44 land. In 1991 she operated from T22 and T30. In 1995 she was QRV from 5R8. 1997 saw her operating from A35 and other islands. Hilde loves to travel and India is

her dream destination.

DJ0FR, Annemarie Föderl operates from Wolnzach. This village is about 50 km north of Munich. It is situated in the largest hop planting area of the world and produces about 30 % of the world's demand on hop. She is licenced since 1985. In her radio club she participates in different YL activities. She was on air during the Soccer-Worldchampionship 2006 with the callsign DQ2006J on several days from May to July.

In March 2005 and 2006 she was invited for activating the club station of "Council of Europe" in Strasbourg / France TP1CE for International Women's Day. It is very difficult and rare to get an invitation for operating at this club station and it is a prestigious event.

DF8MN, Cornelia Wellner, 54, is licensed since 1979. She is a teacher ( German classes for foreigners) for 30 years. She lives near Munich, in Southern Germany, in a small city called Garching. She prefers working contests, especially on 40m and 80m, and is a speaker on the weekly news on 2m and 80m and amateur television. Since 2 years she has been the YL-commissionar for the Bavarian district.

LA6RHA, Unni has for the last 12 years been attached to Norwegian National Guard as an instructor in communication/radio/antennas and things related to that. For many years she has been next in command in the communication platoon of 20 men and is now a commissioned sergeant. She loves amateur radio & is licenced since 1990. She also has a pilot's licence!!! She loves to travel and has been to over 70 countries all together. She has climbed Killimanjaro - Africa's highest mountain, a truly amazing experience. Her other experiences include riding an ostrich in South Africa, dromedars in the Sinai desert, wild elephants on Sumatra, mules to the bottom of Grand canyons and sleeping in tents with a Magnum 0.357 in the backsack and much more. Besides her traveling experiences, Unni is an expert in "casualty make-up" which really means doing make-up on people to make them look sick and injured. This is her second trip to India.

7K3EOP Noriko Tokura graduated from medical college, and was assigned by the Japanese Government as an Instructor for the Nurses in Afghanistan Government where she met her husband, who was there with the Diplomatic service in the United Nation. Noriko participated in 8N1NGO activities for international cooperation days at Hibiya Park in Tokyo. She was one of the operators to promote international cooperation. Over 200 organization countries, including India and NGO are represented there. She also participated in the T88OP..She has operated as VK9WY, YA1JA, W6RO, IQ9YL, KH6/7K3EOP and is in the honour roll of the IOTA.

VU2SWS Sarla is the Vice President of the Amateur Radio Society of India and is the editor of its magazine, the "Ham Radio News" She has operated from AT0AI, AT0EI and AT0RI island expeditions. She is qrv from texas as W5/VU2SWS when she is visiting her son and his family in the USA. In 2002 she was part of W5AW/5 in the CQ Worldwide SSB contest. She was the official Indian delegate at the IARU Region 3 meeting held in Bangalore in August 2006 and has been appointed as the Liaison officer for the IARU in India. She lives in Mumbai and is active on all bands on SSB and digital modes.

Every meeting is organized along with an optional tour of the host country. After this meeting, all the YLs will be traveling to Jaipur, Agra ,New Delhi and Goa for 1 week. ARSI promises all YLs participating, an experience of a lifetime in India.

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**The ARSI will be operating with a special call sign VU7LD from Lakshadweep Islands from 1st Dec-31st Dec.2006.**
**Members of ARSI, proficient in ssb, cw, digital modes wishing to join in this important event may please get in touch with the president ARSI, Mr. Gopal Madhavan immediately via email:gopalmadhavan@vsnl.com**

KUDOS CORNER

SWL VISWANATHAN (VU-0020)HAS RECEIVED THE FOLLOWING AWARDS:

FROM INTERNATIONAL SHORTWAVE LEAGUE (1) PACIFIC OCEAN AWARD GOLD (SL.NO.8) (2) STATES AWARD GOLD (SL.NO.10) (3) CENTURY CLUB 250 COUNTRIES (SL.NO.742) (4) CONTINENTAL AWARD SI.NO.553 (5) ZONE AWARD SL.NO. 421 (6) AFRICAN DX DIPLOMA GOLD SL.NO. 22 (7) COMMONWEALTH GOLD AWARD SL.NO. 19 (8) AMERICAS AWARD GOLD SL.NO.15 (9) EUROPEAN GOLD AWARD SL.NO.35 AND ALSO RECEIVED WORKED REPUBLIC OF INDIA AWARD.
CONGRATULATIONS!!!

ON SEPTEMBER 12TH THE MADRAS SECOND REPEATER VU3 MVR OPERATING ON 145.675MHZ - SHIFT COMPLETED 14YEARS OF SERVICETO THE HAMS. THE MEMBERS OF MADRAS VHF CLUB DETERMINED TO MAKE THIS SERVICE AVAILABLE TO MANY MORE YEARS TO COME.

*CONGRATULATIONS TO THE MADRAS VHF CLUB!*

*A hearty welcome to all the delegates*
*of the* International YL Meet *in Mumbai*
*our best wishes to the*
*Amateur Radio Society of India*
*in hosting the conference*

# A V THOMAS GROUP COMPANIES

64 Rukmani Lakshmipathy Salai
Chennai - 600 006.

## AWARD NEWS

On behalf of the JAMSAT(Japan-AMSAT) board, it is my great honor to draw your attention to our brand new award, named JAMSAT Five Stars Award.
Issuing of this award is intended to get more higher activity of radio amateur communication over satellites and eventually to have more fellows in this field and protect the frequency allocation given to the amateur satellites use.
This Award is opened for world wide, with following terms and conditions.
1.The applicant is required to establish a QSO with five(5) different stations over five (5) different Satellites.(Total 25 QSL Cards required)
2. One specific satellite is counted once, even the QSO was made on different mode or band on the same satellite.
3. Valid only 2way QSOs. Cross mode QSOs are not valid on this award.
4.The QSOs using Digital mode and SSTV are valid, however you are requested to get QSL Cards. (e-QSL is not acceptable)
5.No specific endosement (eg. CW, SSB) is provided.
6. QSOs made after the January 1st, 2006 00:00 UTC are valid.
7. As for the application, no specific format is provided. You can use your own QSO list, however it is recommended to use a format of ARRL or JARL. Please send your GCR, certified by 2 radio amateurs, but please DO NOT send QSL cards to us. (We can not take any responsibility against it)
8. Fee on the application From abroad, Ten(10) "NEW" IRCs should be sent with the application form. For the domestic application, 800yen should be remited by Postal Money Order. (If you were member of the JAMSAT, then 400yen is applicable)
9. Donations are welcomed This is not a duty, but your any donations to build new amateur satellites will be most welcomed by us. If you were agree with this, then please add some amount on top of the award application fee. JAMSAT will surely remit those your warm donations to the AMSAT-DL and/or AMSAT-NA accordingly. (Please understand that the JAMSAT-Board is entitled to divide the sum of donations for each party and project.) 10. Mailing address--Please forward your application to the following.
JAMSAT AWARD OFFICE
For the attention of Mr. S. Murakami
PO Box 26, Mizushima Post Office, Kurashiki, Okayama 712-8691, Japan
11. Query e-mail to: madoguchi@jamsat.or.jp
Mikio Mouri JA3GEP
President of the Japan-AMSAT (JAMSAT)

## SATELLITE NEWS

The ARISS team does not plan to use the 144.49 downlink for SSTV for the long term. The ARISS team fully understands the Region 1 band allocations and wishes to abide by them. It should be noted that amateur satellite communications are allowed by ITU rules in the 144-146 segment. The reason that we have different uplinks in different regions is that the three ITU regions do not have consistent frequency allocations per mode. As an international team, ARISS and many ham radio entities worked hard to clear as many systems (repeaters, APRS, etc) from the lower edge of the AMSAT Satellite band segment (145.80-146) as possible. This enabled ARISS to have a dedicated downlink on 2 meters 145.80.

Our Russian team members were running some initial tests on SSTV. They utilized 144.49 for these initial tests because they wanted to do a full checkout of the SSTV downlink and there are still a few repeaters on 145.80 in Russia. These tests were successful. We appreciate the amateur community's patience on this while our Russian colleagues were running these tests. Based on these initial tests, the ARISS international team has been working on some procedures for long-term use of SSTV. This includes the use of SSTV on the 145.80 international downlink. As we get closer to final checkout of the system, you will see these changes made.

How to Decode SSTV from Space:

http://www.marexmg.org/fileshtml/howtouseiss.html All SSTV transmissions will be in FM mode and will most likely be on the 2-meter band. This means that the Doppler frequency drift will not be much of a problem and you will be able to use your existing 2-meter station or a police scanner to hear and decode the signals from ISS.

If you have already have been successful in working the Packet station or talked to the ISS crew on 2-meter voice, than you already have most of what you need. What's left is to connect your computer to the speaker of your radio and some SSTV decoding software, such as ChromaPix or similar software.
Http://www.barberdsp.com/

There are many choices in SSTV software, some Free, others with more features cost a few bucks.
Http://www.marexmg.org/fileshtml/sstvlinkpage.html So have fun, find your best setup and start practicing how to decode SSTV on 2-meters. Location of Hardware on ISS This link will show you images of some of the amateur radio hardware already installed on ISS
http://www.marexmg.org/fileshtml/radiohardware.html
Marexmg Web page http://www.marexmg.org

**How is the IARU Managed and Administered?**

The IARU is co-ordinated by an Administrative Council (AC) with a President, Vice President and two representatives from each of the three Regions. One society provides the IARU secretary and the International Secretariat (IS) that provides administrative services. The American Radio Relay League (ARRL) carries out these tasks from their headquarters in Newington, Connecticut. They make a major contribution to amateur radio on our behalf. We need to acknowledge the support given to the IARU by the amateurs in the USA who are members of ARRL.

A 31/2 BAND YAGI

# *KC6T builds an elegant 10/15/20 meter triband beam, with bonus "backwards" coverage of 12 meters.*

**Bill Stein, KC6T**

*Article reprinted from QST*

Some years ago I had a great time constructing a five band, 2 element cubical quad antenna.[1] But I have always wanted to try my hand at a competitive multiband Yagi, one that could be constructed with commonly available materials. Because of my space limitations, a 14 foot maximum boom length was placed on my list of wants, along with the ability to operate on at least 10, 15 and 20 meters. In addition, I expanded the list to include full legal-limit operation, a wide SWR bandwidth and low losses consistent with moderate antenna weight and wind loading.

The usual suspects were considered, including log-Yagi designs, the Log Periodic Dipole Array (LPDA), the traditional trapped antenna and open-sleeve designs—each having its own advantages. I modeled the antenna configurations using *EZNEC*,[2] and ended up combining features found in two basic antenna types: a trapped tribander and an open-sleeve design.

- It is a tribander, covering all of the 20 and 15 meter bands, and 1 MHz of the 10 meter band, with a wide SWR operating bandwidth, low losses and a competitive gain and front-to-back ratio.
- It also operates on 12 meters, but with a level of SWR across the band that is high enough to require a tuner. Here it also has a competitive gain and front-to-back ratio—but the pattern is *reversed*. The front for this portion of the antenna is the back of the triband portion. So I call this my "3½ band antenna."
- It weighs about 65 pounds, has a calculated wind loading (at 45° to the boom) of 121 pounds at 70 mph, and has a center of weight balance and a center of wind balance that are very close to each other.
- Boom length is 14 feet, with a turning radius of 18 feet.
- The antenna features 3 elements with a single, low-loss 15 meter trap in each element half (of the 15 and 20 meter elements), plus an open-sleeve, parasitically driven 4 element, 10 meter array—this is effectively a 3 element array as well.
- It has a single coaxial feed line, coupled to the driven element through a commercially available choke balun. It needs no feed-point matching system, such as a beta or hairpin match.
- A wide SWR operating bandwidth is achieved without trap losses usually encountered with conventional trapped antennas. More on this later.
- The number and length of the individual element parts takes into consideration that 6 foot lengths of aluminum tubing may be more economical in the quantities required.
- The antenna is shown schematically in Figure 1.

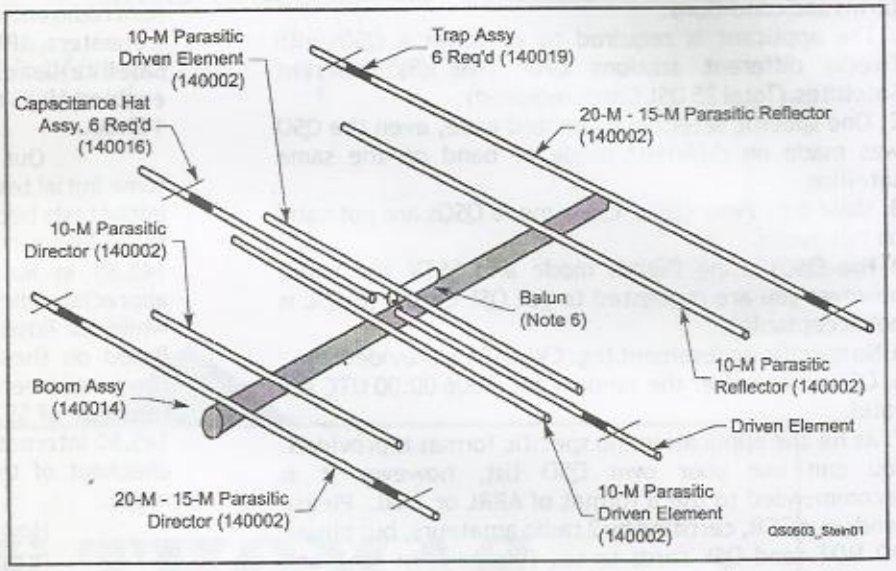



**Figure 1—Schematic layout of KC6T 3½ band beam. Numbers in parentheses refer to drawings available on the ARRLWeb.[3]**

## Why Use Traps?

There is much discussion about lossy traps in today's ham community and about the advantages of a trapless antenna. There is an excellent selection of commercial antennas available that include arrays of 2 element antennas on a common boom, log periodic dipole arrays (LPDA), hybrid log-Yagi systems, the familiar triband trapped array and others. All choices incorporate trade-offs—whether they be mechanical sturdiness versus weight, gain versus boom length, operating SWR bandwidth versus gain bandwidth, the number of bands in a single antenna array versus other performance figures—and this antenna is no different. Traps can be lossy—but even the mechanical joints where antenna sections are joined together can be lossy, especially after some weathering. What is interesting is just how lossy a system might be and what, if anything, can be done about the losses.

With a conventional trapped triband Yagi each element half has two traps. The trap closest to the boom is a parallel L-C circuit that resonates in the 10 meter band. It acts to *disconnect* the portion of the element extending beyond the proper length for 10 meter operation. When I operate on 15 meters, the 15 meter trap

[1]Notes appear on page 37.

acts in the same way but the 10 meter trap (which is still in the circuit) acts as a loading coil, shortening the required physical length of the 15 meter section for resonance. The loading also causes the SWR bandwidth of the resulting 15 meter antenna to be somewhat narrower compared to an unloaded antenna. When I operate on 20 meters, both traps act like loading coils, resulting in more physical shortening of the required 20 meter elements and further narrowing of the SWR bandwidth on 20 meters. Trap unloaded Q has an effect on these properties, but regardless of the Q, the trade-offs tend to make the operating SWR bandwidth more limited compared to a full-size antenna system. Adding more bands by adding more parallel-resonant traps in series compounds the problem further.

This antenna uses only a single, high-Q trap in each element half for the 15 and 20 meter bands. This improves SWR bandwidth on these bands significantly, while minimizing the total losses attributable to traps. The calculated total trap losses for all six traps is about 0.1 dB, and the operating SWR bandwidth is the whole 20 meter band and most of the 15 meter band.[4,5] The 10 meter portion of the antenna is an open-sleeve driven array with no traps that yields an operating SWR bandwidth of 1 MHz.

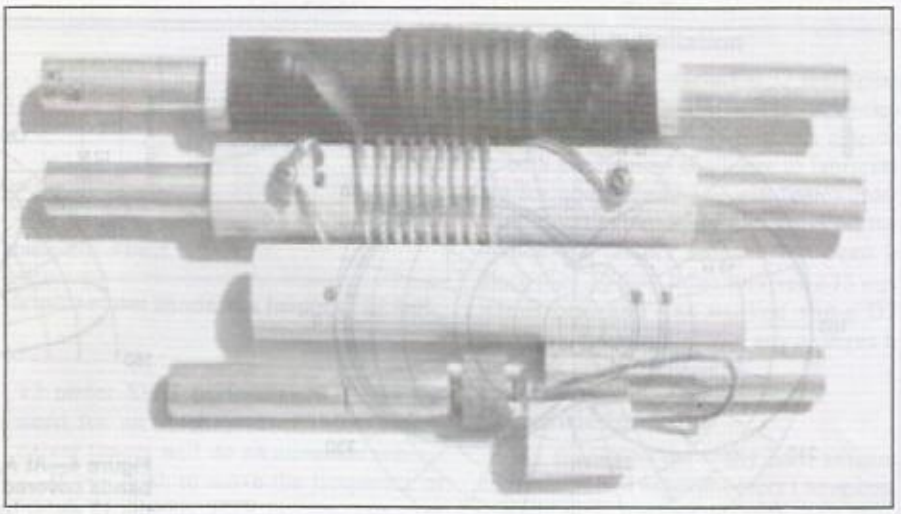


Figure 2—The trap assembly is shown in various stages of fabrication. The mechanical components are detailed in the drawing package available on the ARRLWeb site. This photo shows the 50 pF NPO capacitor attached to its trap terminal, complete with a flexible wire. The coil form and insert are also shown. Although this particular design used a shrink-sleeve cover, the final design used two coats of gray epoxy paint instead.

Figure 3—The area around the boom-to-mast plate for the KC6T beam. The Cal-Av Labs balun is mounted under the rearward 10 meter open-sleeve driver. All elements are mounted on the boom-to-element plates using cast acrylic-insulating blocks.

## Trap Construction

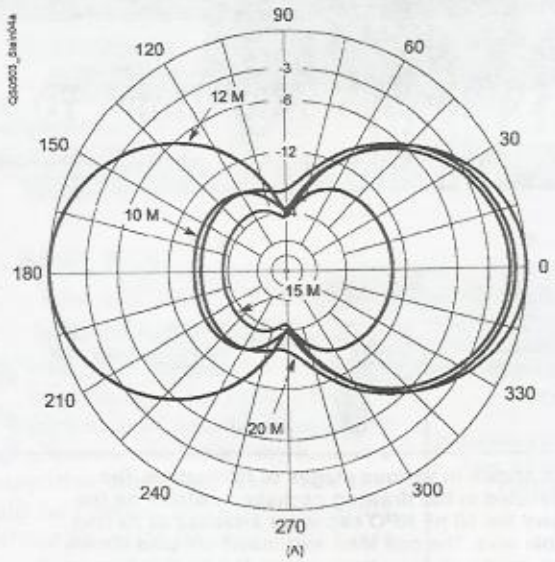
Careful attention to the step-by-step instructions will permit trap construction with a minimum of difficulty, since all six traps are identical. The completed trap consists of a 10 turn inductor[6] wound on a ¾ inch schedule 40 PVC water pipe coil form and a parallel-connected 50 pF, 7500 V NP0 transmitting capacitor.[7] PVC is not the ideal material from which to make the coil form in terms of electrical losses, but it is readily available and more than strong enough.

Figure 2 shows a trap assembly in various phases of construction. In this early model I used shrink sleeving over the completed assembly, but this was not included for the final design. Heat from the shrinking operation caused the PVC to take a slight set, resulting in loosened electrical connections.

A complete set of fabrication drawings for this antenna can be downloaded from the ARRLWeb.[8] Preparation of the PVC forms and other trap components is detailed in these drawings. The basic idea is to make the coil form from ¾ inch PVC and the inserts from ½ inch PVC. The inserts are split axially with a single-width hacksaw blade, then placed in a fixture and drilled for ⅝ inch ID holes. The fixture is simply a ¾ inch diameter piece of PVC that is also split axially with a single-width hacksaw blade cut and then held together with a pair of hose clamps until the insert has been drilled.

After you have fabricated the trap components, start construction by assembling the transmitting capacitor to the trap terminal/capacitor mount. Attach a flexible multi-strand copper lead, about 8 inches long, to the second capacitor terminal. Next, install one of the coil-form inserts into the end of the coil form that has a single hole through the sidewall. Press the coil form in until it is flush with the end of the coil form. Insert the capacitor/terminal tube assembly into the opposite end of the coil form, terminal tube first. Gently press the assembly terminal tube through the installed coil form insert until the terminal tube extends beyond the coil form by 2½ inches. Do not force the terminal through the insert, since damage to the capacitor may result. If required, redrill the bore of the installed insert until the capacitor terminal tube can be inserted with moderate pressure. Feed the capacitor flexible wire lead through the inside hole at the open end of the coil form.

Now install the remaining coil form insert into the open end of the coil form and press in the plain terminal tube until it extends beyond the coil form by 2½ inches. Using 5 minute epoxy and a small screwdriver, apply the glue to the aluminum reinforcement pieces and insert them until they are flush with the inside end of the terminal tubes. Allow the glue to set. Using the end holes in the coil form as a guide, drill the appropriate size hole through the coil form insert, the terminal tube and the reinforcement tube. This gives a screw on each end of the coil form to electrically connect the terminal tubes, the capacitor and the coil. A #8 pan-head self-tapping screw could be used, although I prefer to use #8-32 stainless-steel machine



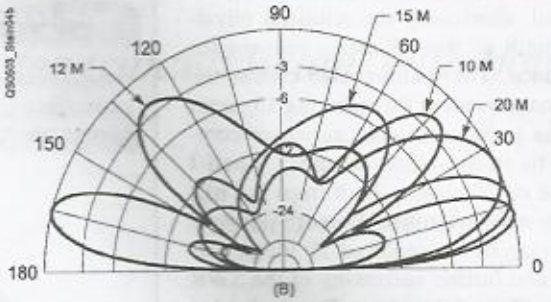




**Figure 4—At A, azimuth plots for the four frequency bands covered by the KC6T beam. The response for the 12 meter band is reversed compared to the 10/15/20 meter bands. At B, elevation plots for the same bands at a height of 37 feet above flat ground.**

screws and washers, requiring me to use the correct size drill and tap. These screws also act to secure the terminal tubes to the coil form assembly.

Form an "eye" in one end of the coil wire and attach to the terminal screw on the capacitor side of the coil form. Carefully route the first turn to provide for the main body of coil turns to be away from the internal capacitor body. Wind 10 turns as evenly as possible, forming another eye to terminate the coil on the opposite end of the coil form. Trim off excess length from the flexible wire from the internal capacitor and attach a terminal lug. Attach the lug to the adjacent coil terminal.

Using a grid dip oscillator, carefully adjust the trap windings until the assemblies resonate between 21.175 and 21.200 MHz. This is done by either squeezing or prying apart the coil turns as evenly as possible. In this process, a coil should be as far removed from metallic working surfaces or other electrical components as possible. Make sure that the coil forms and coils are free of grease and dirt. Then use masking tape to cover the exposed trap terminals. Paint the assemblies with two coats of epoxy spray paint, allowing the first coat to dry thoroughly before applying the second. Remove the masking tape when the trap assemblies are completely dry.

When installing the trap assemblies to their respective elements, the screw terminals should be oriented toward the ground (facing down). The end of the coil form through which the capacitor flexible wire protrudes should also be oriented toward the antenna element tip. This arrangement provides a convenient drain for any moisture that might appear inside the trap coil form.

## Remaining Antenna Components

I made the boom-to-mast plate from a T-6061 $^5/_{16}$ inch thick aluminum blank, 17$^3/_4$ inches long by 9 inches wide. It is a complex part because the center of weight and wind load is where the driven element and the close-spaced 10 meter parasitic driven elements are all located. This plate does not permit the mast to extend above the boom of the antenna. See Figure 3 for a close-up of the center of the boom.

All U bolts are 2 inch by $^5/_{16}$ inch. I fabricated and installed a pair of metal strips for each boom-to element plate as insurance that they will remain aligned perpendicular to the boom, even though this was probably overkill.

I made the element-support insulators from cast acrylic material that has a UV inhibitor. Figure 3 shows how each element is supported on an insulator. Notice how the balun[9] is fitted underneath the rear 10 meter parasitic driven element. The insulators are attached to the element-to-boom plates with #10-32 stainless-steel screws, as are the elements attached to the insulators.

A generous amount of overlap between the telescoping aluminum tubes is used for mechanical strength. The trapped driven element is split at the center for the antenna feed point. An insulating coupler is inserted inside the two halves. I used a fiberglass tube but you could also use a solid acrylic plastic rod with a 1 inch OD. The two center holes (#18 drill through) are provided for two #8-32 stainless-steel machine screws, nuts and washers to connect the two feed wires from the balun.

The center sections of the parasitic elements are reinforced with smaller OD aluminum tubing, as is the center of the boom. Reinforcement pieces ("BE" in the drawing package) provide added strength to the boom wall where the four outer elements are attached. An additional 8 inches of 2 inch OD tubing will be required to make the four pieces needed.

All boom-to-element support plates are made from $^3/_8$ inch thick, 2 inch wide 6061-T6 aluminum. A different boom-to-element plate is used for the trapped driven element, while the remaining six elements use the same design for their plates.

The two outer boom sections are each attached to the boom's center section with a $^1/_4$-20 stainless-steel machine bolt, lock washer and nut. After placing the two internal boom reinforcement sections ("BE"), drill a small hole through the outer boom section and reinforcement, add a small sheet-metal screw to hold each of the reinforcement sections in place during assembly of the boom to the boom-to-mast plate.

I used a capacitance-hat assembly shown in the drawing package. An even simpler capacitance hat is also suggested in that package. The design of the balun mount depends on the balun you choose to use. To keep feed lines short at the attachment point to the trapped driven element, choose a balun that will fit along the top of the boom. Mine was mounted underneath the rearmost 10 meter parasitic driven element.

## Buying the Aluminum Tubing

The required quantity of tubing de-

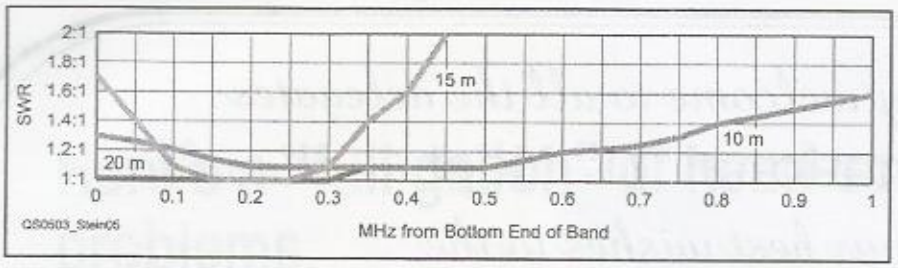



**Figure 5—Measured SWR plots across the 10/15/20 meter bands at a height of 37 feet.**

pends on the number of antennas being fabricated but also on the available lengths of each piece. In general, longer tubing lengths will result in less scrap. But shipping costs and minimum-order requirements may more than offset any scrap material savings. Six-foot lengths of tubing can be shipped for modest cost by UPS. I chose to buy tubing in these lengths as a reasonable trade-off between (large) minimum quantities, shipping costs and tubing prices.[10]

## Antenna Assembly

When you assemble each element, remember to use conductive compound at all the tubing interfaces. The trap assemblies are inserted in the appropriate element section until the trap body is flush against the mating antenna element sections. Place the capacitance-hat assemblies on the ends of the trapped elements where shown.

The boom center section (2 inch diameter by 72 inches long) has internal reinforcement pieces ("BC"). Note that these are *not* placed in the center of the 2 inch diameter center portion of the boom. Assemble the element insulators to the element-to-boom plates and then mount the elements to their respective element plates. Then install the completed element assemblies to the boom. Install the boom-to-element plate reinforcement parts ("BE"). These help keep the boom from being crushed by the element plate-to-boom U bolts. Assemble the boom-to-mast clamp to the boom and double-check the element-to-element spacings. Finally, install the balun to the boom such that the balun body passes under the rear 10 meter parasitic driver. Connect the short balun leads to each side of the split driven element.

## Antenna Adjustment

Figure 5 shows the measured SWR curves across the frequency bands covered. This shows a slightly narrower SWR operating bandwidth for the 15 meter band than the computer model, but the 20 and 10 meter SWR data are in close agreement with the calculated values. The 12 meter SWR performance shows the need for an antenna tuner. Most transceiver tuners will do an adequate job.

If you wish to move the frequency at which the lowest SWR occurs, you may do so, using the information in the drawing package. Because the 10 meter portion of this antenna is parasitically driven, changes in the lengths of both the 15 and 20 meter elements will have minimal effect on the 10 meter performance. But changes to the 15 meter section will affect the SWR characteristics of the 20 meter section.

Calculated azimuth and elevation patterns are shown in Figure 5. The performance of the Yagi on 12 meters is quite respectable, even though the forward direction is off the backside of the antenna.

On 10 meters the spacing between the trapped driven element and the two 10 meter open-sleeve driven elements is quite sensitive. The SWR on 10 meters can be shifted to another frequency by altering the length of the two 10 meter parasitic driven elements equally, and altering the 10 meter director and reflector proportionally. For example, the lengths of each 10 meter element half-length are:

- Parasitic reflector: 111 inches
- Parasitic driven: 100 inches
- Parasitic director: 96 inches

If you decide to shorten the driven element by 1 inch (99/100 = 99% of the original length):

- New parasitic reflector: 0.99 × 111 inches = 110 inches
- New parasitic driven: 99 inches
- New parasitic director: 0.99 × 96 inches = 95 inches

The SWR characteristics for the 15 meter band can be shifted in frequency by the same means suggested for 10 meters. A shift in the SWR characteristics for 20 meters section can best be accomplished for small changes by changing each of the 20 meter element lengths after the trap by the same length. Thus if you shorten each tip of the 20 meter driven element by 1 inch, you should also shorten each tip of the 20 meter reflector and director by 1 inch.

## The Final Installation

I mounted my antenna at 37 feet, using a guyed tubular crank-up tower—a vintage Tristao model. You may find this antenna to be a mechanical challenge to fabricate, but for your efforts you will be rewarded with electrical stability and good performance. So far my antenna has been in place over 3 years. It has survived a 75 mph windstorm and has worked some DX toughies. It has not shown any changes in its SWR characteristics.

## Acknowledgments

My thanks to the many ham antenna enthusiasts and experimenters I have contacted, each willing to exchange their views and antenna experiences during many enjoyable QSOs. My special thanks to my wife, Diane, who encouraged me to design and build this antenna. She put up with a huge number of hours spent over a hot computer and a similarly large number of hours spent fabricating and installing this beauty on my tower.

### Notes

[1]"A Five-Band, Two Element Quad for 20 through 10 Meters," W. Stein, *QST*, Apr 1992, p 52.

[2]*EZNEC 3.0*, Roy Lewallen, W7EL, PO Box 6658, Beaverton, OR 97007; **www.eznec.com**.

[3]See **www.arrl.org/files/qst-binaries/stein_yagi.zip**.

[4]See Note 2.

[5]*Reference Data for Radio Engineers*, Howard W. Sams & Co., 6th edition, 1975, pp 6-4 to 6-8.

[6]#8 solid aluminum ground wire is available in 40 foot lengths from RadioShack, catalog no.15-035.

[7]Available from Surplus Sales of Nebraska, 1502 Jones St, Omaha, NE 68102. Their Web site is **www.surplussales.com**.

[8]See Note 3.

[9]The balun I used was a Model EB-1, manufactured by CAL-AV Labs Inc, 1802 W Grant Rd, #116, Tucson, AZ 85745, purchased at HRO.

[10]I purchased aluminum tubing in 6 foot lengths from Texas Towers, 1108 Summit Ave #4, Plano, TX 75074.

*Photos by the author.*

*Bill Stein, KC6T, was first licensed in 1954, and enjoys both ragchewing and chasing DX, operating CW, SSB and PSK31. He is an active designer and homebrewer, having built not only antennas, but also a microcontroller based SWR/power meter, a solid-state audio record/playback device integrated with his HF transceiver, and the usual solid-state keyer projects. He is especially fond of restoring and operating vintage ham equipment. Bill received his BSE from UCLA in 1958, and spent most of his career working in the computer peripherals field. For the last 7 years, Bill has been self-employed as a consultant to management and is involved with industrial electronic products. You can reach the author at* **steinwa@earthlink.net**. QST

*A hearty welcome to all the delegates*
*of the* International YL Meet *in Mumbai*
*our best wishes to the*
*Amateur Radio Society of India*
*in hosting the conference*

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# Here's a "full gallon" of head-scratching problems.

One of the most popular homebrew projects is the RF power amplifier. They're simple, give on-the-air results, heat the shack and provide a place for the cat to snooze in the winter. Amplifiers are cornerstones of radio from the lowest of the low bands to microest of the microwaves. How's your amplifier IQ?

1. If an amplifier would increase your power output from 100 to 500 W, while a new tribander would add 6 dB of forward gain over your existing dipole, which device will make your signal louder?

2. Will a fan capable of moving air through an amplifier's cooling system at a rate of 1 cubic meter per minute be able to cool a tube that needs 25 cubic *feet* per minute?

3. The heaviest circuit available in the shack is rated at 20 A, 115 Vac. Your new amplifier consumes a maximum of 3 kW. Will the circuit handle the load?

4. To reduce the second-harmonic interference from a 20-meter amplifer to a nearby station operating on 10 meters, a quarter-wavelength stub is added at the amplifier's output. Should the stub be open or shorted? What length should the stub be if the amplifier is operating on 14.200 MHz and the coaxial cable's velocity of propagation is 66%?

5. A transmit/receive relay has a 12 Vdc coil with a resistance of 50 Ω. If your transceiver's keying line is rated at 100 mA, will it be able to switch the relay?

6. To combine the output from four solid-state amplifier modules, you decide to use a power combiner that has an insertion loss of 1.5 dB at each of its four inputs. If each module provides 100 W of power, how much is available at the combiner's output?

7. To avoid overdriving the amplifier input, the output of your 200-W transceiver must be reduced to 50 W. How much attenuation is required (in dB) to achieve this?

8. FCC Rules state that all harmonics must be at least 40 dB below the fundamental signal. You are transmitting on 20 meters using a triband Yagi antenna. A friend nearby using another triband Yagi informs you that your second harmonic on 10 meters is S3 at her house while your fundamental is S8. Without considering any mitigating propagation factors, are you legal?

**Total Your Score!**

There are a total of 10 possible answers in this quiz. Give yourself one point for each correct answer.

8—10 Your knowledge is in the "high power" category!

5—7 Not quite a full gallon of expertise, but not bad.

1—4 Maybe QRO isn't for you.

**Answers**

1. The amplifier provides a gain of 10 log (500/100) = 6.9 dB.
2. Yes—one cubic meter equals 35.3 cubic feet.
3. Three kilowatts at 115 V ac translates to a current flow of 26 A—operating the amplifier on this circuit is dangerous! Run a separate, heavy-duty circuit to the shack just for the amplifier. If the amplifier can be powered from a 240-V line, use a 240-V circuit to cut the current in half. Check your local electrical codes as well.
4. While there are a number of possible combinations of stub designs, the most straightforward is a shorted stub, cut to ¼-wavelength at 14.200 MHz. The stub acts like an open circuit at the 14.200 MHz and like a short at the second harmonic, at which it is ½-wavelength long, 28.400 MHz, attenuating the undesired signal. The length of the stub is 0.66 × ¼ × (300 / 14.2) = 3.49 meters. Shorted stubs also have the added feature of not presenting high RF voltages at an exposed open circuit.
5. The coil current is 12 V / 50 W = 240 mA. Your keying circuit won't last long!
6. A dissipation of 1.5 dB passes 70.7% of the input power to the output. The 400 W going into the combiner results in 400 x 0.707 = 283 W at the output.
7. The attenuation must be −10 log (50/200) = 6.02 dB. A 6-dB pad will be fine. Note—the minus sign is required to calculate attenuation. The power ratio could also have been reversed.
8. If each S-unit is 6 dB, your harmonic is 5 × 6 dB = 30 dB below the fundamental. You have a problem!
9. At 35 WPM, each dit is about 25 ms. This relay will do the job.
10. Thirty kg is equivalent to 66 lb. Subtract the weight of the transformer and you have 26 lb for cable, four feet of which weighs 1 lb. You can carry 104 feet of cable (without connectors).

9. Can a relay that switches in 5 msec support full-QSK at 35 WPM?

10. You're a member of a DXpedition team and you're assigned to carry the 40-pound amplifier power transformer along with several lengths of coaxial cable. The flight to the island allows 30 kg of carry-on weight. If your coax weighs 4 ounces per foot, how many feet of cable can you carry on board?

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