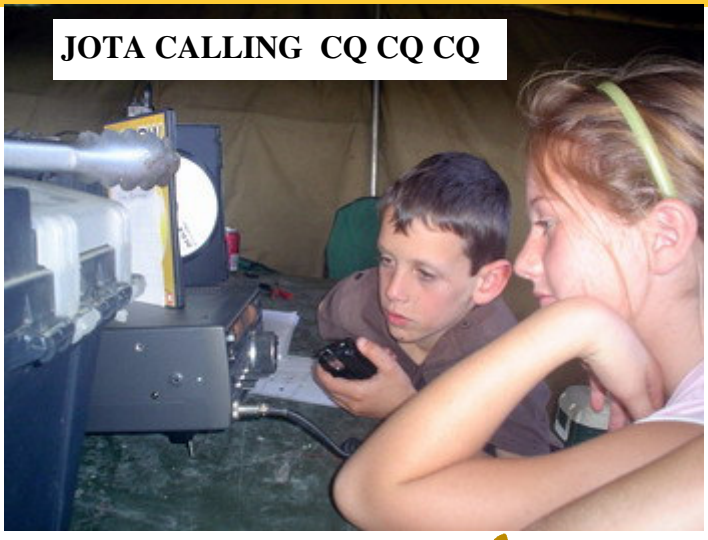
OFFICIAL NEWSLETTER OF THE

BORDER RADIO CLUB



ZS2BRC/J

RADIO AMATEURS DO IT BY FREQUENCY

Affiliated to the SARL

FEEDBACK

November 2008 Featuring Jolly JOTA

WHAT IS Dstar

D-STAR (Digital Smart Technologies for Amateur Radio) is a digital voice and data protocol specification developed as the result of research by the Japan Amateur Radio League to investigate digital technologies for amateur radio. While there are other digital on-air technologies being used by amateurs that have come from other services, D-Star is one of the first on-air standards to be widely deployed and sold by a major radio manufacturer that is designed specifically for amateur service use.

D-Star compatible radios are available on VHF and UHF and microwave amateur radio bands. In addition to the over-the-air protocol, D-Star also provides specifications for network connectivity, enabling D-Star radios to be connected to the Internet or other networks and provisions for routing data streams of voice or packet data via amateur radio call signs.

The first manufacturer to offer D-Star compatible radios is Icom, and no other amateur radio equipment manufacturer has chosen to include D-Star technology in their radios, yet. Kenwood re-brands an Icom radio and distributes it in Japan only.

History

1999 - Funded by the Japanese government and administrated by the JARL, investigation was put into finding a new way of bringing digital technology to amateur radio. 2001 - D-Star is published as the result of the research.

Unknown Date - Icom enters the construction of the new digital technology by offering the hardware necessary to create this technology.

Unknown Date - The conclusion of all this work is the digital technology for amateur radio called D-Star

February, 1 2008: Icom announces the availability of Gateway 2.0 software.

April 23, 2008: Icom and US trust server administration announce the shutdown of the Gateway 1.

Technical details

D-STAR transfers both voice and data via digital encoding over the 2 m (VHF), 70 cm (UHF), and 23 cm (1.2 GHz) amateur radio bands. There is also an interlinking radio system for creating links between systems in a local area on 10 GHz.

Within the D-Star Digital Voice protocol standards (DV), voice audio is encoded as a 3600 bit/s data stream using proprietary AMBE encoding, with 1200 bit/s FEC, leaving 1200 bit/s for an additional data "path" between radios utilizing DV mode. On air bit rates for DV mode are 4800 bit/s over the 2 m, 70 cm and 23
cm bands.

In addition to DV mode, a high speed Digital Data (DD) mode can be sent at 128 kbit/s only on the 23 cm band. A higher-rate proprietary data protocol, currently believed to be much like ATM, is used in the 10 GHz "link" radios for site-to-site links.

Radios providing DV data service within the low-speed voice protocol variant typically use an RS-232 or USB connection for low speed data (1200 bit/s), while the Icom ID-1 23 cm band radio offers a standard Ethernet connection for high speed (128 kbit/s) connections, to allow easy interfacing with computer equipment.

Importance of Digital Technology and D-STAR

As long as the signal strength is above a minimum threshold, and no multi-path is occurring, the quality of the data received is better than an analog signal at the same strength.

The system today is capable of linking repeaters together locally and through the Internet utilizing call signs for routing of traffic. Servers are linked via TCP/IP utilizing proprietary "gateway" software, available from Icom. This allows amateur radio operators to talk to any other amateurs participating in a particular gateway "trust" environment. The current master gateway in the United States is operated by the K5TIT group in Texas, who were the first to install a D-Star repeater system in the U.S.

Another important aspect of D-STAR technology is its ability to send large quantities of data to emergency responders in the event of a disaster. Served agencies can instantly relate to sending "email" or a "word files" to someone.

What effects Internet download Speed?

DSL and cable modems are fast, much faster than dialup modems, if you haven't used the internet over a DSL or cable line before, then they are faster than you've imagined them to be.. but are they as fast as the ISP or Telcom is telling you they are?

How are broadband lines sold?

DSL lines, following the tradition of 56k and previous modems, are sold in kilobits per second. They are sold by naming two speed quantities.. download speed and upload speed. The ISP will put more emphasis on download speed, sometimes not even mentioning upload speed at all as if that side of the equation is inconsequential to you, when in fact, upload speed can be a critical part of the performance puzzle.

The typical speed quote comes as a three and sometimes four digit number, often with the same or smaller number alongside it. This is a kilobit per second speed rating. Another way is to express speed as mbits.

How do DSL kilobits per second translate to speed?

Browsers and other file transfer agents tend to show speed in terms of kilobytes per second, usually with one or two decimal

places.. Thus, you may see your browser report a "Transfer rate:" being "XX KB/Sec", (along with the flying paper graphic as displayed to the right. Audio and video playing applications tend to report the data rates needed or used, in terms of kilobits.

Aside: Browsers sometimes use this estimated transfer rate to predict the total time a download is going to take. (For some reason, transfer rates displayed by browsers are rarely accurate .. in this example, the transfer rate displayed of 194KB/sec was not correct - data can buffer up before the timers are started, and this causes exaggerated readings, especially when only part of the download has yet been received). So.. bytes and bits? I just divide by 8 then?

DSL Speed Maximum Visible

Transfer rate

256k~28KB/sec — 384k~42KB/sec — 640k~69KB/sec - 768k~83KB/sec

Not so fast! Communications equipment vendors like to think in terms of low level ATM data rates without regard to the structure or content of the data.. ATM is a protocol for transferring data communicating, therefore, and in particular, tcp/ip. So your data is going over your DSL line via tcp/ip over ATM. TCP has an overhead in transmission that can be as low as 3%, but ATM overhead is more like 10% .. So you can expect to lose 13% of your purchased speed at least when counting application data transfer rate. Making up a rule of thumb here: Given a broadband line speed, dividing by 8 and taking off 13% is a reasonable estimate of the maximum likely data download speeds (in bytes of data) you will manage to get.

The ideal world

In an ideal world, you should be able to see in your browser download window, during a sustained transfer, a rate equal to your purchased speed, divided by 8 (to get bytes), less 13% (TCP/IP and ATM header overhead). It is unlikely you will ever see that speed though. !!!

APOLOGIES

1) In the last issue of Feedback I talked about the club obtaining a UPS (universal power supply), but I incorrectly called it a USB and a UBS. Please accept my 2 dyslexic apologies.

2) The Field Strength meter circuit diagram also seems to be suspect !. Can anyone correct the missing battery earth ?. As it looks as if the two resistors short out the battery.

Tony ZS2BQ shows them how it's done

Humor ?

1 Two antennas meet on a roof, fall in love and get married.
The ceremony wasn't much, but the reception was excellent.

2. Two hydrogen atoms walk into a bar. One says, "I've lost my electron."
The other says, "Are you sure?" The first replies, "Yes, I'm positive..."

3. A jumper cable walks into a bar. The bartender says, "I'll serve you,
but don't start anything."

4. A sandwich walks into a bar. The bartender says, "Sorry we don't serve
food in here."

5. A dyslexic man walks into a bra.

6. A man walks into a bar with a slab of asphalt under his arm and says:
"A beer please, and one for the road."

7. Two cannibals are eating a clown. One says to the other: "Does this
taste funny to you?"

8. A man complains, "Doc, I can't stop singing 'The Green, Green Grass
of Home.'"
"That's the Tom Jones Syndrome," explains the doc.
"Is it common?" asks the man. "It's not unusual," says the doc.

9. Two cows are standing in a field.
Daisy says to Dolly, "I was artificially inseminated this morning."
"I don't believe you," said Dolly. "It's true, no bull!" exclaimed Daisy.

10. An invisible man marries an invisible woman. The kids were nothing
to look at, either.

11. Deja Moo: The feeling that you've heard this bull before.

12. A man takes his Rottweiler to the vet and says,
"My dog's cross-eyed, is there any thing you can do?"
"Let's have a look at him." says the vet. So he picks the dog up and
examines his eyes. Finally, he says "I'm going to have to put him down."
"Just because he's cross-eyed?" asks the man.
"No, because he's really heavy," says the vet.

13. I went to buy some camouflage trousers the other day but I couldn't
find any.

14. I went to a seafood disco last week and pulled a mussel.

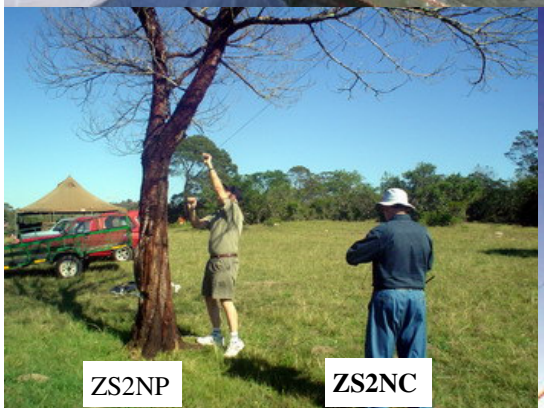
15. Two Eskimos sitting in a kayak were chilly; but when they lit a
fire in
the craft, it sank, proving that you can't have your kayak and heat it too!

16. Two fish swim into a concrete wall. One turns to the other and says, Dam.

Setting up camp. ZS2ILN– ZS2NP-ZS2BQ

AWAY WE GO WITH THE
1st CAMBRIDGE SCOUTS

ZS2BQ OPENS THE JOTA WEEKEND



ZS2NP ZS2NC

Setting up the Trapped Dipole Tarzan style Tree to Tree

JOTA CAMP SITE

A CUB IS SHOWN HOW TO HOLD THE MIC.

PHIL'S SMILING FACE—ZS2NP

THE JOTA TEAM
HAVING A WELL EARNED LUNCH BREAK
ZS2NP-ZS2ILN-ZS2NC-ZS2ABF-ZS2BQ

THE SCOUTS COOKING LUNCH

NICO ZS2NC SUPERVISORS THE BRC ELECTRONICS KIT BIULDING PROJECT

The Cubs and Scouts came to the shack in groups of 4 and built a Burglar Alarm. Great fun was had by all and off they went proud to have completed all the insertion/soldering/testing tasks. We are sure they should receive an Electronics Badge. (One or two even got a First Aid one due to the burnt fingers. Hi)

ZS2ILN ALSO GIVES A HAND TO HELP AND GUIDE THE VINCENT CUBS WITH THEIR KIT BUILDING PROJECT

Vincent Cubs busy with another more Basic Electrical project

JOTA Camp 18th October 2008. **Vincent Cubs and 1st Cambridge Scouts held their camp on a farm 25 Km out of town. The Border Radio Club set up an HF field station running on batteries and feeding into a Trapped Dipole, slung between 2 trees at a height of 7 Mts.**

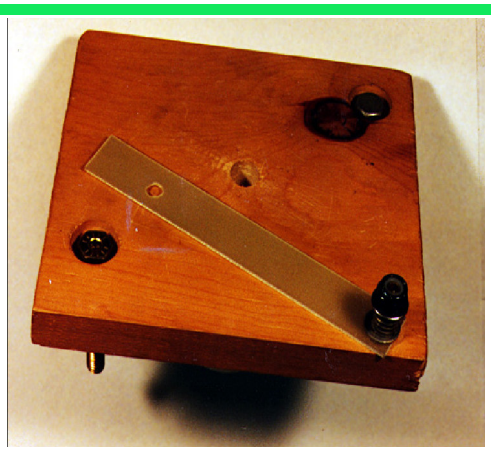
The main object was to let as many Cubs/Scouts talk to as many JOTA stations as possible. This they did and even the Scout Masters talked to other Scout Masters around South Africa. We mainly worked on 40 Mts. In the afternoon we switched to 20 and 15 Mts. To catch some DX. Some of the stations worked were;

KH7TV/P on SAIPAN Island in the Pacific Ocean. HS0ZHC in the North of Thailand and DQ4W in Germany. Then it was back to 40 and more talking to other JOTA stations.

The highlight of the day was to see the Cubs and Scouts learn to put components into a PCB then cut and solder them in place. All were successful but, a faulty new speaker gave the tutors a hard time fault finding Hi. Even the Cub mistresses got involved in the building so as not to be out done by the youngsters. Thanks go to Nico for organizing the project so well.

The Cubs and scouts were informally dressed during this relaxed weekend.

1st Cambridge scout talking to other JOTA stations around the country



Drilling a PC Board

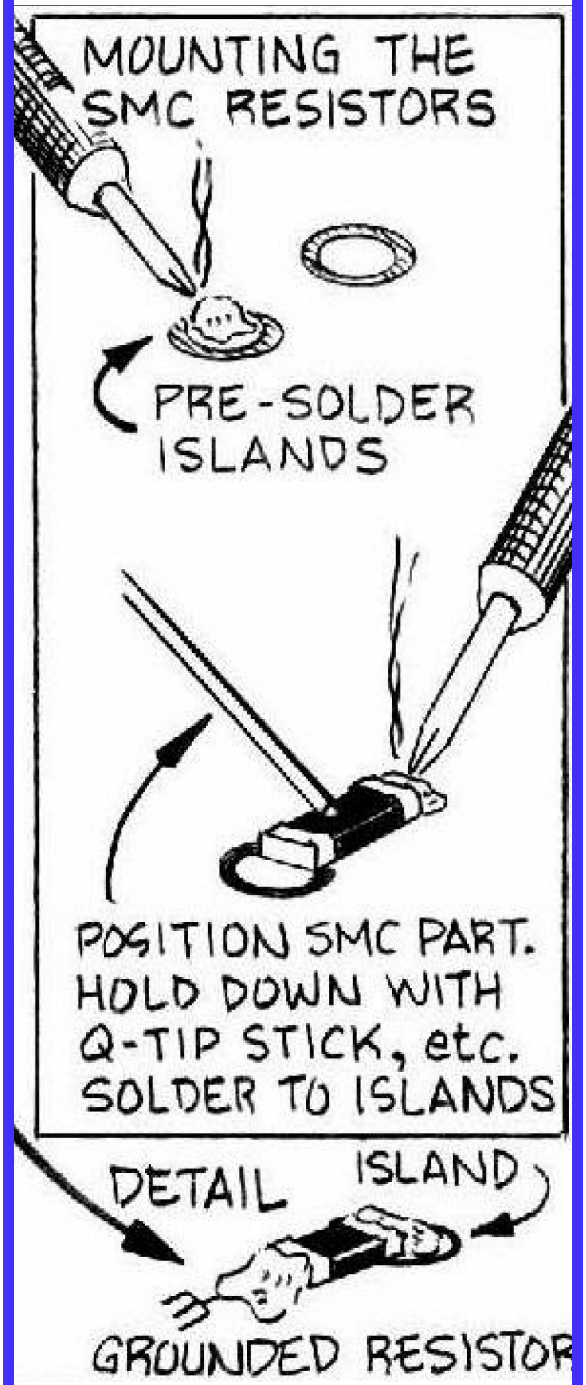
After you make a PC board using one of the above techniques, you need to drill holes in the board for the components. Use a drill press, or at least improvise one. Boards can be drilled entirely "free hand" with a hand-held drill but the potential for error is great. A drill press or a small Moto-Tool in an accessory drill press makes the job a lot easier. A single-sided board should be drilled after it is etched; the easiest way to do a double-sided board is to do it before the resist is applied.

To drill in straight lines, build a small movable guide for the drill press so you can slide one edge of the board against it and line up all of the holes on one grid line at a time. **See Fig 1 Above.**

This is similar to the "rip fence" set up by most woodworkers to cut accurately and repeat ably with a table saw.

TIP OF THE MONTH

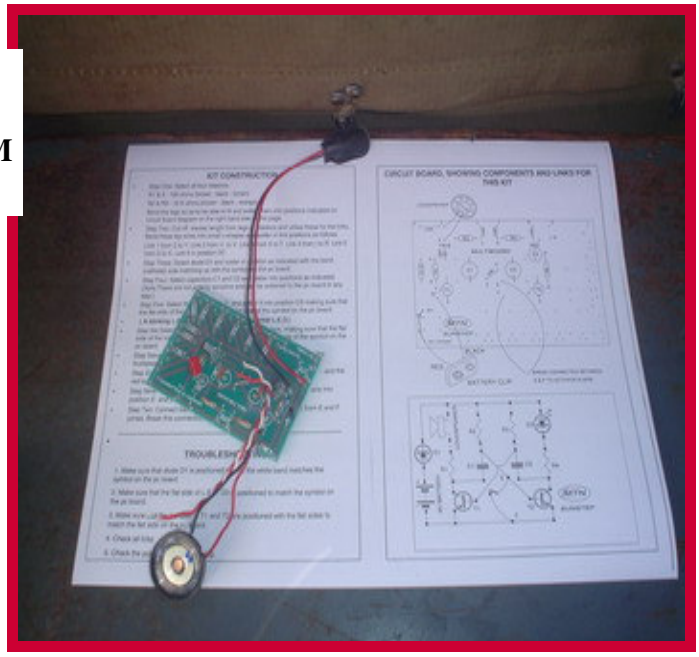
SOLDERING SURFACE MOUNT COMPONENTS



Attaching an SMT part. Things are a lot easier attaching capacitors, resistors and other discrete components compared to multi-pinICs. Carefully hold the component in place and properly aligned using needle-nose pliers or tweezers and then solder one end of the component. Then reheat the joint while gently pushing down on the component with the pliers or a Q-tip stick to ensure it is lying flat on the board. Finally, solder the other side of the component.

“Talk & Solder” were the orders of the day

THE COMPLETED ALARM KIT WITH CIRCUIT DIAGRAM



EVEN THE "BIG BOYS" PLAYED WITH THEIR TOYS

SCOUTS TOYS
"FOOFIE SLIDE"

EAST LONDON HAM'S OF YESTER YEAR
Can you remember this display, and the Amateurs that manned it . Is the small boy today's local Ham ?

Honorary Life Members

ZS2BV Trevor Foxcroft
ZS2KW Ken Wood

Your Committee

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Fred Pike	ZS2AP	043 - 7270744	082-3741265	082-3741265	alfredp@telkomsa.net

The Border Radio Club holds monthly General Meetings every third Tuesday of the month at The Gatehouse, Eskom's Sunilaws Office Park, Quenera Drive, Beacon Bay at 19:30 for 19:45. Anyone is welcome to attend. The Club can be contacted via e-mail to ivan3@telkomsa.net. Listen to our Sunday bulletins at 07:45 on 145.650 MHz. Visit our website at www.sa-eastcape.co.za/brc. The South African Radio League's website can be found at www.sarl.org.za.