



International HAM Magazine - **100% HAM RADIO**

A 70cm / 2m crossed satellite antenna

What is a good ground ?



9 Tips for PSK-31 !

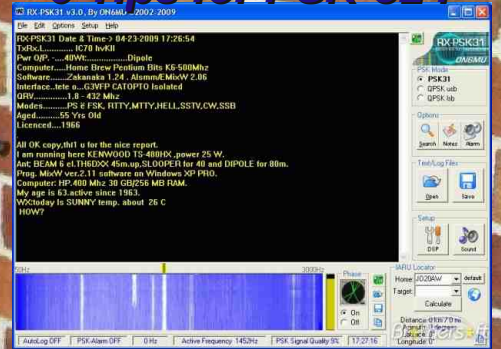


TABLE OF CONTENTS

A crossed satellite Antenna



P.15

[HOMEBREW]

RF Sniffer

21 DX Calendar

24

Second life of dead MFM
Hard drives

6

Contests of the month

28

[CATEGORIES]

A flexible digital mode
interface

10

POST IT !

3 50MHz - DX News

29

A to D conversion

4 What is a good ground ?

31

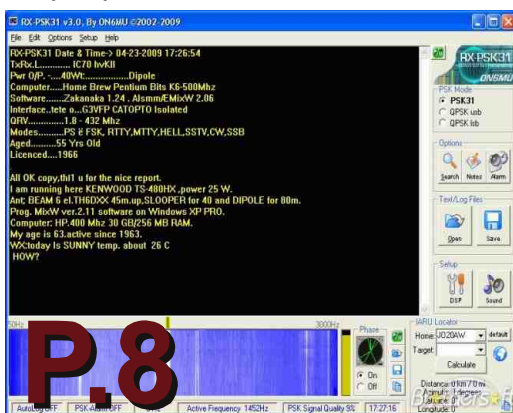
9 tips for PSK-31

8

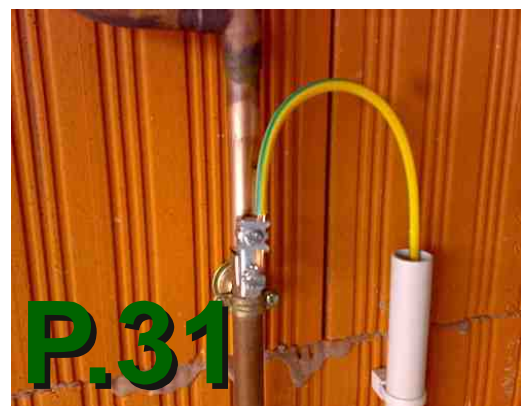


8 El. (70cm) + 7 El. (2m)
crossed satellite antenna

15



P.8



Comic's HAM

39

DX NEWS

22

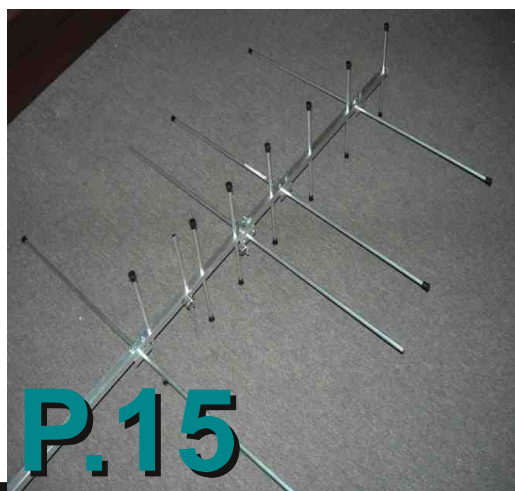


P.22

[HISTORY]

The history of Torre Bert

36



P.15



POST-IT !

The breaking News



Radio Maritime Day :

The Friendly one of old of SAINT LYS RADIO op's will take part in 4th local RADIO-MARITIME DAY of April 10, 2010 starting from 12:00 utc to April 10, 1200 utc

Created within l' AMARAD (Association of the radio operator Sailors: <http://amarad.org/>) this event annual is organized by the Officers Radios of the Merchant navy, Fishing, the Radios of the Navies and the former operators of the terrestrial Radio-maritime Stations of all the countries of the World

The Radiomarine Day points out the past to us and emphasizes the present of the maritime radiocommunications to include/understand the developments in the old, modern and future successive technologies. Contacts radio operator traditional Morse but also those by aid of computers will be done on frequencies radio hams HF especially dedicated to this occasion

A special call sign TM2FFL will be used (FFL taking again the letters of St Lys Radio) the universally known station which rendered a service priceless and recognized during 50 years from 1948 to 1998 for the sailors commercial, steamers, sinners, aviation, ONG, boating pleasure and races

An opportunity of friendly meeting again between radios and ignorant , maybe an occasion of a live radio contact with a ship?

Preferred CW fréquences 1854 3520 7020 14052 21052 28052 KHz

also DIGIMODES PSK 31 / 63 / 125 / 250 on 7047 and 14077 KHz

Hope to meet you - **vy 73 gérard f5yd**

Ham radio heroine meets The Queen

The Royal Commonwealth Society recently invited Mrs Bharathi VU2RBI, Chief Coordinator of the National Institute of Amateur Radio (NIAR) to present a testimony on the eve of Commonwealth Observance Day.

At the event, which took place on the 8th March 2010 in Westminster Abbey, London in the presence of Her Majesty Queen of England, the Duke of Edinburgh, Prince Charles, High Commissioners of Commonwealth Countries and a group of school children etc, Mrs.Bharathi narrated her experiences in the field of Amateur Radio Communication and contribution to the society for promoting Science & Technology.

It was indeed a rare honor and privilege for an Indian women amateur radio operator to receive this invitation from among the 54 Commonwealth countries.

After the ceremony, a tea party at Royal Commonwealth Society was organised, and followed by reception at Buckingham Palace, where she met Her Majesty the Queen of England.

Mrs.Bharathi told the Queen about her involvement in the promotion of Amateur Radio Communication in India and the activities of National Institute of Amateur Radio, Hyderabad in disaster management over the last three decades.

The Royal Commonwealth Foundation, London has shown great interest in promoting Amateur Radio Communication as a part of disaster management in the Commonwealth Nations.

Read more at: <http://www.niar.org/VU2RBI%20Commonwealth%20day.pdf>

(Info from G4TUT)

A to D conversion

By KA5DON

No, this isn't about the analog to digital converters or breakout boxes as some used to be called. It is trying, learning and conquering the digital modes, sometimes not new, but new to me.

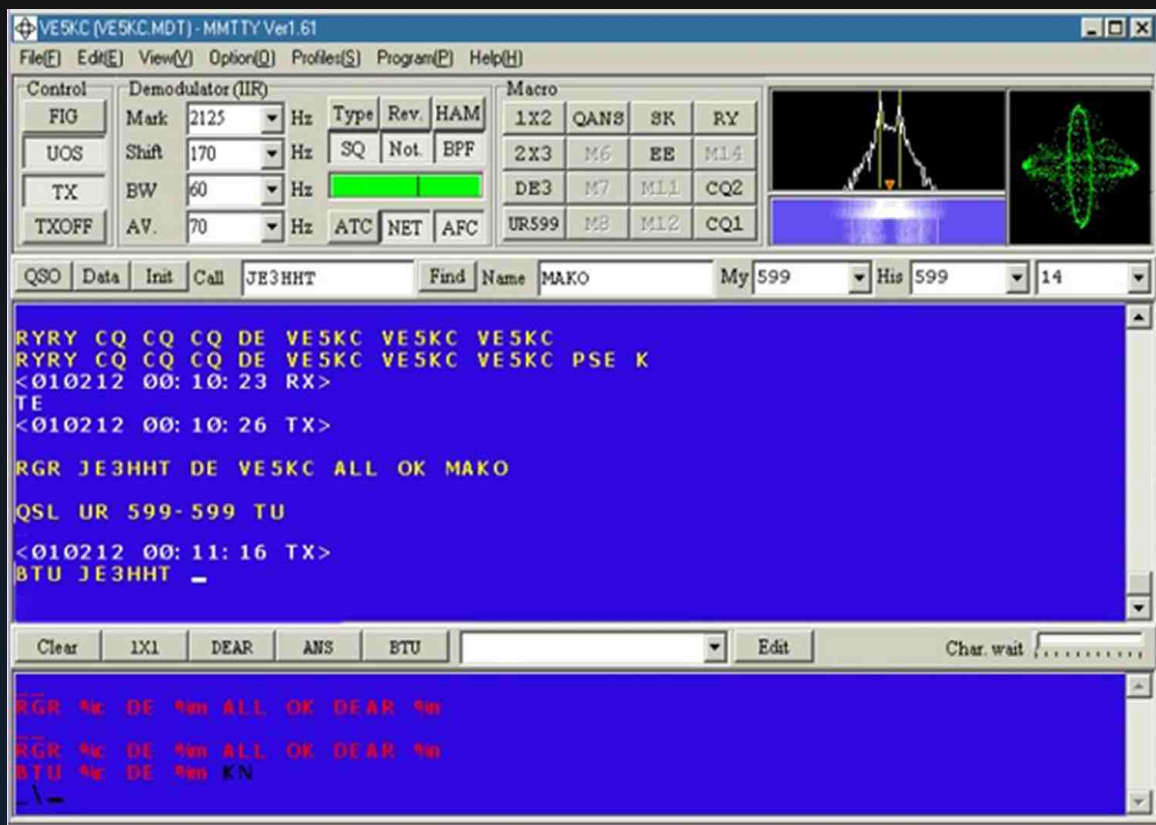
I have had to learn a number of lessons, some multiple times, to become what I call successful at some digital modes. Success my me is measured by that first QSO. But, one of the lessons is that just because it worked once, doesn't mean that it will always work, or even work the next time you turn the rig/computer on.

While the rig is important, it is perhaps the least important. You have the radio which I won't discuss, the interface, of which I will discuss a few of the commercial ones, and the most important aspect of the discussion will be the software. There I will discuss some of the single mode software, some multi mode software, and then some of the just about everything there is software.

I know many of the different email reflectors argue that CW and green key RTTY are digital and I will let them have that argument. I will be talking about computer generated, software formed modes of operation. There are tens of thousands of amateur radio operators out there with far more experience, understanding and skills at the various modes than I am and certainly do not present myself as an expert, only as an operator.

Originally licensed in 1978 in Alaska, I slowly acquired the communication skills of CW. In 1979, I started on my digital journey with the DGM electronics keyboard generated CW/RTTY modes. While I had a KSR 28 and a 28RO (receive only), I became more dependent on the DGM. In 1980, we sent over 300 ARRL Mothers Day Messages using the DGM. When we moved to Michigan in late 1980, the KSR stayed in Alaska, but the RO and DGM went with me to Michigan. In 1983 we moved to Japan and for 3 years, all the equipment stayed in storage in northern Wisconsin. Not the best environment for electronics. In 2003 I caught the bug again and after 7 months of studying the new, digital, multi-mode radios, I bought a TS-2000x. While I was learning about the different radio's, I started learning about the "new" modes of PSK and digital RTTY. I began downloading every piece of software I could find (that was free) and began the learning process.

Since I understood the concept of CW (an electrical tone turned on and off) and RTTY (single tones shifted 170Hz), I started with them. I had also done my research on interfaces. I had looked at and focused my search on the lower end of the price scale (out of necessity) and narrowed the field down to the Buxcomm or the West Mountain Radio Rigblaster Plus. I decided on the RigBlaster Plus and when it came, I stared at the cables, jumpers, and connections. The instruction book was helpful, but the picture diagram was my source of success. I now had a radio, and interface that I had tested and when I keyed the radio, the PTT light came on the interface. Now for the software. I had looked at MMTTY and HamScope. My choice became MMTTY for the single functionality of RTTY and the more than adequate help files and willingness to help new users on the email reflectors. MMTTY BY JE3HHT - Makoto Mori became my first challenge.



MMTTY has it all, clear, crisp, easily understood layout of the software. The Upper Right corner has the elliptical tuning scope, to the right are the band scope and waterfall. Center area holds the Macro's which were easy to set up. Just right click and enter the text you want for that key. Moving further to the left are some software controls for defining shift and whether you have to have the signal reversed (as Kenwood does). If someone tells you are upside down, I have learned to push the REV key. The middle area is the received portion, and the lower portion, the transmit area.

It was really easy to tune a RTTY signal. First, tune the radio frequency so the waterfall/spectrum lines are over the 2 RTTY lines, then fine adjust so the twin elliptical circles look like the ones in the picture above. The received text will magically decode in the upper text window.

Setting the macro keys is just as easy. Right click on any of them and enter your text. There are of course shortcuts and embedded text to enter contest numbers.

Within a week I was entering a RTTY contest. MMTTY has it's own logging program, so I used it. Again, the settings inside the software itself becomes paramount and must be set specific to each interface and radio. The software itself can be found at <http://mmhamsoft.amateur-radio.ca/pages/mmtty.php>. Don Hill AA5AU is the King of RTTY and his web site has the finest RTTY tutorial there is. You can find detailed information about downloading, setting up and operating MMTTY from the expert at: <http://www.aa5au.com/rtty.html>.

MMTTY, being my first computer digital mode has fueled my interest because after a few stumbles (make sure you read the section on using EXTFSK) I was able to begin my string of successes. My next article will be about my first multi-mode Software MixW.

Till then, 73, Don KA5DON

Second Life of Dead MFM Hard Drives - Iambic Paddle By UUICC



Just finished my first in life "Instructable" at the D.I.Y. host site instructables. It is short sketch about Iambic Paddle which has been made using a spare parts from the dead MFM HDD drive. I got a lot of fun posting to that site, and I think that it should be good idea to post more detailed article here. Frankly, this homebrew project is not a Pure Glowing Bug, but I'm not so puristic today.

Well, let me explain - why I decided to use HDD heads as a levers in this Iambic Paddle Project. For many years I've collected computer spare parts for no reason, just because I have a big, nearly endless Junk Box and it was impossible to me to throw such high-

tech toys in the trash. But one morning I found that my Junk Box is full and The Time of Trash Bags has come. It was a hard work, but under the tons of debris I found the treasure - my first homemade Z80 Sinclair Spectrum and five old 5 inch MFM hard drives from my second computer.

As you remember, these drives was a big rounded shaped boxes, ideal as a chassis for any homemade electronic projects, tube glowbugs as well as solid state stuff. Another interesting things - powerful electromotor and magnetic cylinders itself, thick shiny discs which are so usable as a dial or scale part, looked much better than a CD in this role. And last but not least - yes, precision bearings on the easy to mount axis in magnetic head's block. What a beautiful hardware! When I opened and totally disassembled these hard drives, I realized that I literally had a very new telegraph key, usual one lever, dual lever iambic paddle or even straight key - not so important, it is easy to make any kind of telegraph manipulator using these nice spare parts. Watch this [video](#) demonstrating a working Iambic Paddle and take a look at step by step constructing process here:

Step 1: Extracting Heads from Dead Drives



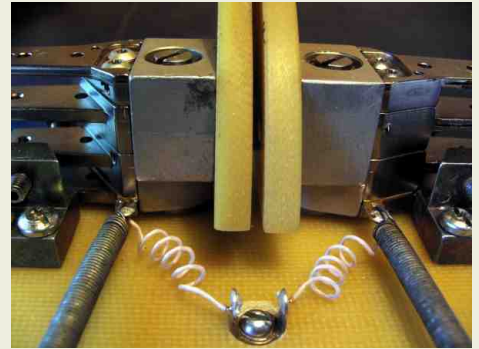
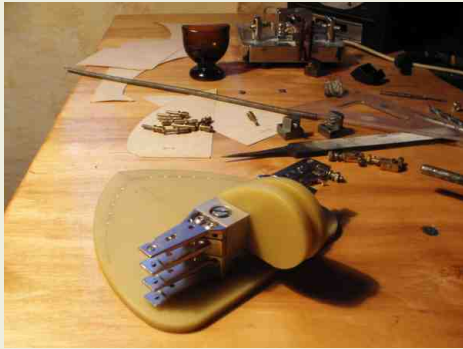
Step 2: Cut off fag end



Step 3: Breadboarding and making the plastic base



Step 4: Assembly and assembled views



And you are ready for calling CQ...
Best 73's ! UU1CC



9 TIPS FOR THE PSK31 DIGITAL MODE

BY DAN



PSK31 is arguably the most popular amateur radio digital mode. It utilized phase-shift-keying to provide robust, narrow signal width communications, and requires very little power to QSO the world!

1 - Use the center of your waterfall. Testing will show that your transmit (TX) and receive (RX) will be strongest there. Don't blindly use 1000Hz tone or strictly follow the VFO 'set it and forget it' concept. You can easily lose 20% or more of your power on each edge of your pass band. Pass band centering of the signal will give the best results of both RX and TX.

2 - There's no need to have the waterfall streaking bright red. Set your rig's volume to a low level (less than 25% of max) and adjust your waterfall and soundcard levels for a good contrast. Do not overdrive your soundcard! Get the background noise and the transmit trace well defined and separate. Keep in mind, how your waterfall looks does not impact decoding, but it is harder to work it if you can't see it.

3 - Use UPPER CASE characters sparingly. Lower case text in PSK31 varicode transmits fewer bits of data, thus you'll increase transmit speed and improve the likelihood of proper decoding on the other end. For example, the difference of a lowercase e and an uppercase E is five times more bits! (e=11 vs. E=1101101101)

4 - Enable your RF Attenuation and increase the volume. This helps keep a strong signal from wiping out the weaker ones. Attenuation will probably be around 20 dB, but by dropping the noise level, the signal readability improves. AGC (auto gain control) does nothing for a weak signal; it only levels the louder ones.

5 - Use your digital modes software, or a program like Spectrogram, to see what your noise level is with the radio off. This will give you an idea of how 'clean' your soundcard is. Typically, onboard (built-in) sound hardware (as found in most 'mainstream' computers like Dell or HP) does not have a signal-to-noise ratio as good as an inexpensive (less than \$50) separate soundcard. When purchasing a soundcard, look for something with over 100 signal-to-noise ratio in the specifications.

6 - Consider dual monitors (most modern video cards have two jacks). This allows you to have the waterfall or spectrum display on one screen, and your logger, text window, etc. on the other. It makes a huge difference in speed and ease-of-use when you don't have to swap between screens or use smaller windows for your QSO.



7 - Keep your ALC reading during transmit to as close to zero as possible. This will keep your signal clean and your IMD at a good level (-20s or better is ideal). Your power output will drop, but there's no need to 'smoke' the transmit level. PSK31 is about an 80% duty cycle. Even with a full duty cycle rig, it still needs to dissipate heat! Besides, 20 watts more makes little difference. Output of around 50W is enough to work the world, and your fellow CQs will appreciate the courtesy. Also be sure your voice processor is NOT enabling when using digital modes.

8 - Ask for an RSQ (readability, strength, quality) report! When in a QSO, send just a tone and ask for your IMD and a report on how your trace looks. This will give you a better idea of adjustments needed.

9 - There are hundreds of digital modes. To get started or to learn more about the most common ones, acquire ARRL's 'HF digital handbook' by Steve Ford, WB8IMY. For the technical types, be sure to snag Roland Prosch's (DF3LZ) 'Technical Handbook for Radio Monitoring'.

- **'BONUS' TIP:**

Try 30 meters PSK31! It's a robust band, offering the best of 20M and 40M. It's a small segment of a no contesting band. Used only for digital modes and CW. Be sure to operate within your privileges. PSK31 can typically be found around 10.140.

DEFINITIONS of TERMS USED:

AGC (Auto Gain Control): The ability to reduce signal strength on-the-fly (fast or slow), giving you a more level audio reception on stronger stations.

ALC (Auto Level Control): A voltage adjustment or reading, indicating your TX signal levels. ALC is designed to control voice and carrier signal levels, not digital modes. Typically, if the ALC meter moves, then the microphone gain is too high.

Signal-to-noise (S/N) ratio: A comparison of the signal levels to the relative noise level. Ideally, a perfect signal would have no noise, but realistically, you'll want a S/N ratio well within the tolerances of the mode you're using. PSK31 tolerates about a 10dB S/N ratio.

dB: Sound level, or 'decibels' are used to measure the relative strength of a signal.

Digital Mode: A converted signal transmitted from your radio to be 'de-converted' by the receiving station. Much like a computer modem, a digital feed is converted to analog, sent across a transmission medium, then reconverted back to a readable signal at the receiving station.

Duty cycle: The total time of actual transmission levels. When your radio is transmitting, there's an on/off process that takes place. Transmitting at a 100% duty-cycle indicates that you are using 100% of your radio's power, 100% of the time. Better radios will allow this, while others will eventually fail under the pressure of such a load.

IMD (Intermodulation Distortion): The ratio, in dB, used to determine the quality of your transmission. Unwanted 'products' or signals reduces IMD levels. More power does not mean better copy!

Overdrive: Turning the volume of your radio up so high that you risk damage to the soundcard, or cause signal 'splatter'. Similar to maintaining your ALC levels.

Pass band: The range that your transceiver can receive when on a single frequency. Typically around 3000Hz wide.

PSK (Phase Shift Keying): A form of modulation that shifts the transmit signal in order to carry more information. PSK31: is a digital mode created in the 1990's by Peter Martinez (G3PLX) that is about 31Hz wide on your waterfall.

RF (Radio Frequency) Attenuation: A suppression of signals received. You'll often see a noise level reduction, with a minor sacrifice to the desired signal reception. Check your radio's manual on how to adjust it.

RSQ (Readability, Strength, Quality): Much like the familiar 'RST' reports, using a 599-type reporting scheme. Instead of 'Tone' (Morse Code), use 'Quality'. 95%+ readable, with a very strong waterfall trace, and a clean (no splatter) signal would warrant a 599 report.

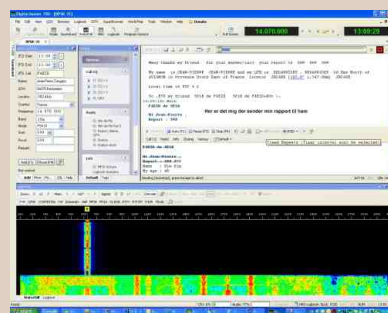
Soundcard: A piece of hardware in your computer that produces sound, and often allows input, as with a microphone.

VFO (Variable Frequency Oscillator): It's that knob you use to change frequencies on your radio.

Varicode: A streamlined coding system that allows nearly whatever your computer keyboard can type to be transmitted in shorter lengths.

Waterfall: A visual display of radio signals (and other sounds) found on the tuned frequency.

Best 73's... Dan

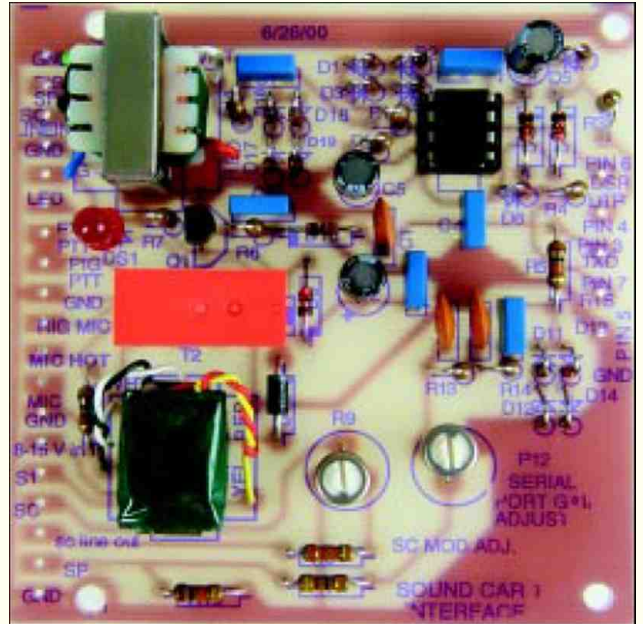


A Flexible Digital-Mode Interface

By Jim, N9ART

One interface, all the software—here's how to do it simply and inexpensively.

On seemed to be reserved for those who possessed the means to purchase and operate sometimes large—and nearly always expensive—equipment. This began to change in the early '90s when software written for home computers began to replace the expensive hardware. Programs such as HamComm1 allow operation of CW, RTTY and some 'TOR modes requiring only a few “junk-box” components to fabricate a simple comparator modem. JVFAX2 uses the same modem to give us SSTV with amazing results. These early DOS-based programs were followed by variations on the same theme, but eventually gave way to Windows-based software. Programmers writing software for Windows didn't want to continue with the sometimes- inconsistent performance of the simple comparator interfaces, so they looked to using the



sound cards with which most computers are equipped these days. A sound card can do most of the signal encoding and decoding required for these modes. Not only does the sound card do a fine job in the DSP department, it eliminates the need for some hardware. All that's necessary now is to deliver the transceiver audio to the sound card's input and send the sound card's output back to the rig's mic or accessory input. A means of keying the rig helps, too.³ Initially, I hesitated to try any of the newer SSTV programs because I didn't want to tear apart my reliable comparator modem setup to reconfigure the audio I/Os to my computer's sound card. I wanted to continue to use the DOS-based programs, but also wanted to enjoy the new modes such as PSK314 and MT635 with software running under Windows. Soon I tired of manually connecting and disconnecting wires to the rig. I realized then that I needed an interface that would allow me to use the comparator modem for DOS applications and use the same I/Os for the sound card programs.

Circuit Description

The interface I designed is shown in *Figure 1*. The comparator section employs a dual op amp (U1) operating as a limiting amplifier with full free-run amplification. This creates the required rectangular waves at an RS-232-compatible level necessary to run the DOS-based SSTV and FAX programs. The four diodes (D1-D4) in the feedback loop of U1A soft-limit the waveform, delivering a relatively symmetrical rectangular wave with rounded tops and bottoms limiting at about ± 2.8 V. U1B is another maximum-gain stage that ensures correct amplitude and rectangular waveform symmetry are presented to the serial port at J1. Open-loop gain in this stage eliminates the effects of the soft limiting at U1A. Op-amp operating voltage is supplied by the computer's serial port via the DTR and RTS lines. Diode matrix D5-D8 (a bridge circuit) ensures proper voltage polarity at the appropriate op-amp pins regardless of how the RTS and DTR lines are defined by the various programs. To perform at their best, SSTV and FAX programs such as EZ-SSTV, JV-FAX, MSCAN6 and EasyFAX7 require only a basic HamComm-style modem.

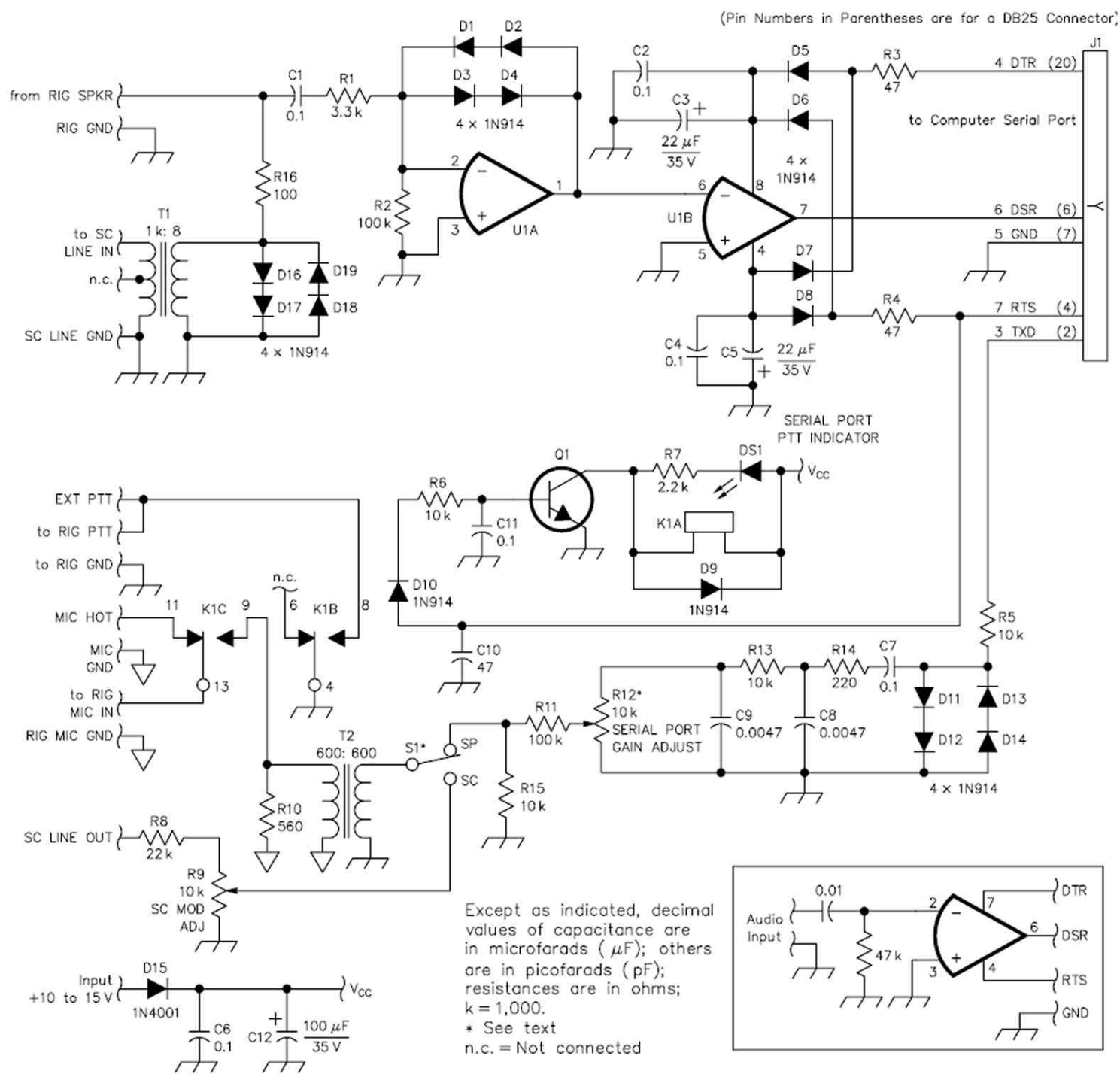


Figure 1—Schematic of the flexible digital-mode interface. Unless otherwise specified, resistors are $\frac{1}{4}$ -W, 5%-tolerance carbon-composition or metal-film units. RS part numbers in parentheses are RadioShack. (Note: All of the resistors used in this project can be found in assortment RS 271-312; specific part numbers are also given.) Equivalent parts can be substituted; n.c. indicates no connection. J1 pin numbers are for a DB9 connector; pin numbers in parentheses apply to a DB25 connector. The inset shows a basic interface referred to in the text. Note that a different ground symbol is used for the connections labeled **MIC HOT**, **MIC GND**, the bottom end of R10 and the primary of T2. These four connections are purposely isolated from the other grounds (see text) and should remain isolated from them and from the enclosure if a metal one is used. The other grounds are connected to a common bus and the FAR Circuits PC-board mounting pads and can be connected to the enclosure.

C1, C2, C4, C6, C7, C11—0.1 μF

(RS 272-135)

C3, C5—22 μF , 35 V electrolytic
(RS 272-1026)

C8, C9—0.0047 μF (RS 272-130)

C10—47 pF (RS 272-121)

C12—100 μF , 35 V (RS 272-1028)

D1-D14, D16-D19—1N914 (RS 276-1122,
package of 10)

D15—1N4001 (RS 276-1101)

DS1—LED from assortment package
(RS 276-1622)

K1—DPDT 12-V dc PC-mount relay
(RS 275-249)

Q1—2N2222 (RS 276-1617)

R1—3.3 k Ω (RS 271-1328)

R2, R11—100 k Ω (RS 271-1347)

R3, R4—47 Ω (RS 271-312)

R5, R6, R13, R15—10 k Ω (RS 271-1335)

R7—2.2 k Ω (RS 271-1325)

R8—22 k Ω (RS 271-1339)

R9, R12—10-k Ω PC-mount pot
(RS 271-282) or use optional 10-k Ω pot
with SPDT switch (RS 271-215); see text.

R10—560 Ω (RS 271-312)

R14—220 Ω (RS 271-1313)

R16—100 Ω (RS 271-1311)

T1—Audio-output transformer
(RS 273-1380)

T2—1:1 isolation transformer
(RS 273-1374)

U1—TL082 dual op amp (RS 276-1715)

A HamComm modem can be as simple as a single op-amp stage, a decoupling capacitor driving the inverting input and a resistor to ground (see the inset of Figure 1). These programs can use such a modest interface because they determine the audio-input frequency by counting waveform zero crossings. A few other SSTV programs, such as GSH-PC,⁸ rely heavily on the symmetry and accuracy of the rectangular wave presented to the serial-port handshake line (DSR) to produce their best picture quality. Waveform asymmetry and inaccuracy can be caused by a number of variables: A computer's DTR and RTS lines are rarely balanced (ie, having equal voltages of opposite polarity) and op amps may exhibit a large dc-offset error.

This circuit, however, fulfills the requirements of all the DOS-based programs mentioned here by providing a very symmetrical waveform at proper RS-232 levels. Q1 is driven by the serial port RTS line via D10 and R6. K1A is energized when Q1 turns on. A PTT switch action is provided by K1B when the software signals transmit and toggles the RTS line positive.

K1C selects the interface's modulating source: the mic, sound card or TxD line of the computer's serial port. When RTS is negative, the mic is selected. When RTS is positive, the PTT line is actuated and either the sound card or serial port is selected. A PTT indicator (optional) is provided by DS1 at the collector of Q1. The modulating source of the interface is selected by S1. In the SP position, that source is the computer's serial port. The SC position selects the sound card LINE output. R8 and pot R9 (SC MOD ADJ) attenuate the sound card's LINE output. T2 isolates the interface and computer grounds from the rig's mic ground to minimize RFI problems. DOS-based digital-mode software provides modulating tones in the form of square waves at the serial port's TxD line. A brute-force low-pass filter comprised of C7, R14, C8, R13 and C9 rolls off much of the square waves to present a waveform more like a sine wave to the rig's modulator; the rig's filtering does the rest of the job. R5 and D11-D14 form a limiter stage that maintains the output of the serial port's TxD line at around ± 3 V. (This circuit is not required for the interface to function, however, and is discussed later.) C6 and C12 filter the external dc source. D15 protects the circuit from an incorrectly polarized power-supply input. R16 and D16 through D19 act as a limiting stage to protect the sound card input from excessively high audio input.

Construction

Component values and types are such that a single trip to RadioShack should be all that's necessary if you can't find the parts you need in your junk-box or that of a friend. The FAR Circuits PC board⁹ makes

building this project easy. Duplicate holes are provided on the PC board for various connections. EXT PTT can be used if an additional PTT line output is needed. Using a PC-mounted control at R12 to adjust the serial-port modulation level is adequate. Once this level is set, there is seldom any need for readjustment. On the other hand, the sound card line output might require more frequent adjustment if multiple Windows-based sound card programs are used; level requirements might vary from one program to another. Adjusting the sound card's mixer panel .WAV output is usually an acceptable means to ensure proper modulation level from the sound card's LINE output.

This could be a minor inconvenience, but I found an excellent resolution to this dilemma in a normally stocked item at RadioShack: a panel-mounted 10-kW control with a SPDT switch (RS 271-215). Using this control for R12 instead of a PC-mount pot allows not only line-output adjustment, but doubles as the modulation-source selection switch (S1). Rotating the control fully counterclockwise to the OFF position selects the serial port (SP) as the modulating source.

Rotating the control clockwise and turning the switch to its ON position selects the sound card's LINE output (SC) as the modulation source. If frequent sound card LINE output level adjustment is not necessary, the PCboard-mounted control should be adequate for your application.

An external 10 to 15-V dc source applied via D15 is required to power the relay and the optional serial port PTT LED, DS1. If the optional PTT indicator circuit is not required, omit R7 and DS1.



Component-Value Considerations

A few component values might have to be changed to accommodate your equipment's level requirements. The TxD data-leveling circuitry (R5, D11-D14) in conjunction with the insertion losses of the low-pass filter (C7, C8, C9, R13, R14) and the attenuation provided by R11, R12 and R15 sufficiently reduce the amplitude of the TxD output to microphone level. This level reduction might be excessive for some applications. If you find that your rig can't be modulated adequately, remove D11 through D14 and replace R5 with a wire jumper. Adjust R12 to see if the level has increased sufficiently to properly modulate your rig. If the level is still not high enough, you can reduce the value of R11, but not below a value of 1 kW. Similarly, R8's value may need altering to ensure proper modulation when the computer's sound card is used as the modulation source.

R8 is the only component in this part of the circuit whose value can be modified, as your computer's audio-mixer controls should be used to set these levels.

Alignment

With all components interconnected and a dummy load attached to your rig, rotate S1 to the SP position. Ensure R12 is fully counterclockwise (minimum resistance). Set your rig's microphone-level control as you normally would. Select a DOS-based SSTV program and load a picture. From within the program, select transmit. The rig should key, but should not be modulating. Slowly adjust R12 clockwise until the modulation peaks just enter the ALC region of your rig's meter. If the modulation level is high as you start to open R12, additional attenuation is required.

Select a value for R11 that allows full modulation at about mid-rotation of R12. If R12 is full clockwise (minimum resistance) and your rig lacks full modulation, try one of the steps mentioned earlier to increase the level through the TxD low-pass filter to your rig's modulating point. Unkey the transmitter.

A similar procedure is used to adjust R9. Place S1 in the SC position to select the sound card as the modulating source. Use the sound card mixer panel to adjust the .WAV output level.

Set R9 fully counterclockwise (minimum). Select a sound card program and set it up to transmit. If you choose an SSTV program for this adjustment, load a picture. From within the program, select transmit.

The rig should key, but should not be modulated. Slowly rotate R9 clockwise and note how the rig begins to modulate. If the modulation level is high as you start to open R9, increase the value of R8 or decrease the sound card's .WAV output level. Select R8's value such that full modulation is realized somewhere around midposition of R9. On the other hand, if the incoming audio level is insufficient to properly modulate the rig with R9 at minimum resistance, decrease the value of R8.

You should easily find a value for R8 that, in conjunction with adjustment of the .WAV output of your computer's sound card mixer panel, results in proper modulation. No provisions have been made to adjust the rig's audio-output level at the interface.

The input of the comparator (U1A and U1B) can handle speaker audio levels ranging from barely audible to full-room volume.

If a fixed audio-level point (such as the output at an accessory connector) is connected to this point, that should do. Use the sound card mixer LINE INPUT control to control the audio level fed to the sound card. Some SSTV programs provide a control for this audio source also.

PC-Board Pin-Out IDs

Most of the connections to the PC board are obvious, but I thought it might be a good idea to identify them here as well. The labels near the PC-board interconnection pads identify lines from the off-board source.

- **RIG SPKR**—Connection your rig's SPEAKER or LINE output (high side) to this pad.
- **SC LINE IN**—Connects to the computer's sound card LINE INPUT jack (high side).
- **RIG GND, SC LINE GND and PTT GND**— Electrically, these are all the same point on the interface. These points connect from the interface to the rig or the sound card as indicated in the labeling.

- **EXT PTT**—This pad is connected in parallel with the relay PTT contacts. This is convenient if you have a secondary PTT actuator such as a foot switch or a grounding switch on the microphone.
- **MIC HOT**—If you're using the rig's mic input as the modulating point for the interface and the microphone, connect your mic to this pad and the mic ground to MIC GND on the interface.
- **RIG MIC IN**—From the rig's modulating input point; either the mic connector, or the accessory jack
- **LINE input**. If you're using your rig's accessory connector as the modulation input to your transceiver, connecting a microphone to the interface's MIC HOT pad (as described earlier) isn't necessary as the mic is likely connected directly to the rig's mic connector.
- **SC LINE OUT**—Input from the sound card LINE OUTPUT jack (high side).
- **+10 to +15 V**—External power-supply connection. Serial-port connection labels are on the component side of the PC board opposite the rig and sound card I/Os. Pin numbers indicated are those for a 9-pin (DB9) connector at J1. If you have a 25-pin serial port connection, use the pin numbers enclosed in parentheses in Figure 1.

Summary

Now you have no excuse for not trying AMTOR, FAX, Hellschreiber, MT63, PACTOR, PSK31, RTTY and SSTV. With this interface, you can operate most of the modes by simply running the appropriate software (much of which is free) and selecting the proper interface. You're sure to have fun!

Notes

- 1 - K7SZL's Unofficial HamComm home page (<http://home.att.net/~k7szl>) contains information on nearly every aspect of the popular HamComm program.
- 2 - The JV-FAX/JV-Comm32 site is <http://www.jvcomm.de>.
- 3 - Most sound card SSTV and other digitalmode software can be found at <http://www.muenster.de/~welp/sb.htm>.
- 4 - For PSK31 information and software, visit the "Official" PSK31 Homepage at <http://aintel.bi.ehu.es/psk31.html>.
- 5 - Information on the MT63 experimental mode and software can be found at <http://members.xoom.com/ZL1BPU/MT63/MT63.html>.
- 6 - GSH-PC is available at <http://ourworld.compuserve.com/homepages/dl4saw> and <http://www.pervisell.com/ham/g1.htm>.
- 7 - PC boards are available from Far Circuits, 18N640 Field Ct, Dundee, IL 60118-9269; tel 847-836-9148 (voice and fax); <http://www.cl.ais.net/farcir/>. PC Board only, \$5 plus \$1.50 shipping for up to four boards. Visa and MasterCard accepted with a \$3 service charge.

73's from Jim, N9ART

Jim Mitrenga, N9ART, received his Technician class license in March of 1979; he upgraded to Amateur Extra class in 1981. Jim's wife, Sandy, is KB9MXF. Jim and Sandy are active on VHF and UHF FM for family communication. HF CW is Jim's favorite mode, but he's active on AM, FM, SSB, SSTV, PSK31, RTTY and packet, and enjoys Amateur Radio electronics design. Jim's other interests include fishing, hiking, bicycling, gardening, computers, audio recording and broadcast engineering. Jim is employed as a program manager at Motorola, Inc, in Schaumburg, Illinois, where he started as an RF design engineer in 1979. Currently he concentrates on digital communications audio quality.

8ele (70cm) x 4ele (2m) Crossed Satellite Yagi By Rob Greaves - VK2GOM

Firstly, I make no claims for originality for this antenna! The basic design was arrived at using the DL6WU DOS-based Yagi designer program, which is freely available on the internet. The finished antenna provides around 10.5dBd gain on 70cm, and 6.5dBd gain on 2m, which is more than adequate to work the FM satellites with a handheld dual band radio (or two mono-band radios) and a couple of Watts.

The antenna design parameters can be tweaked in software, based on the materials you have available. I used aluminium from Bunnings (popular Australian store) tube and section, which was all sized in metric.

All elements are 10mm diameter, and the boom is 19.05mm square x 1.2mm wall, which is actually 3/4" tube that has been 'metrified'!

The Bunnings aluminium is available in 3m lengths, or 1m lengths. For the boom, you will need a single 3m length, cut down of course, and the elements can be cut from the 3m lengths. Careful planning will ensure minimum wastage. One and a bit 3m pieces will do all the 2m elements, and the remaining 70cm elements can be cut from another 3m length of tube, and perhaps another 1m length, if required.

I built my antenna such that the 70cm elements are permanently fixed to the boom, but all 2m elements (including the driven element) are removable to make for easier transport.

All elements are electrically bonded to the boom, which again the DL6WU software can take account of for the necessary boom correction factor.

The driven elements in each case are fed by a simple Gamma match, which is easy to tune using nothing more than an rf source – your hand held radio – and an SWR meter.

OK. Let's build the antenna!

Depending on whether you wish to hand-hold the boom, or mount it on some sort of support or field tripod determines the boom length you will need. My advice is start long – you can always trim it later. My particular antenna is handheld for /P use, which makes for easier operation, since it's not usually a case of simply pointing the antenna at the satellite; quite often you need to compensate for changes in polarisation by twisting the antenna about its boom axis.

First start by cutting the elements. D6, D5, D4 etc. = Directors. DE = Driven Element. Ref = Reflector.

Where necessary, I will refer to each band as 145MHz and 436MHz where confusion could occur with measurements.

For the 145MHz elements, you will need:

D2	=	900.0mm
D1	=	911.5mm
DE	=	972.0mm
Ref	=	1013.0mm

And for the 436MHz elements, you will need:

D6	=	278.4mm
D5	=	280.8mm
D4	=	283.2mm
D3	=	288.0mm
D2	=	294.1mm
D1	=	299.0mm
DE	=	324.6mm
Ref	=	345.9mm

The calculated figures from the DL6WU software come out to two decimal places, which is impractical for home based metalwork, so I have rounded them to one decimal place. Just cut them as accurately as you can. I suggest using a rotating tube cutter to ensure the cuts are absolutely square and neat.

The boom can now be drilled.

It may be prudent to mark with a marker pen which edge of the boom will be drilled for the 436MHz elements, and the other edge for the 145MHz to avoid getting mixed up.

Both sets of elements live on the same boom of course, but 90deg apart. It is normal for the 145MHz elements to be horizontal when the boom is held, and the 436MHz elements vertical.

Choose a side of the boom, and mark it '436MHz'. Now, from one end, measure back 10mm and mark a line. This is your datum point from which the measurements will be made. This is also the point that 436MHz D6 fits through the boom.

For the remaining elements, measure back from the datum point:

From D6 (Datum point), 207.0mm for D5

From D5, 192.8mm for D4

From D4, 172.9mm for D3

From D3, 148.2mm for D2

From D2, 123.5mm for D1

From D1, 54.2mm for DE

From DE, 127.0mm for Ref

Now, centre punch the boom gently at each of these points, mid-width of the boom. Using a sharp 10mm drill bit, drill each hole through both sides of the boom. Here, it is critical to use a bench mounted pillar drill. Do not hope to achieve perpendicular holes with a hand held drill. Bench mount pillar drills are a cheap investment – mine was about \$50 from Super Cheap Auto, and ensures perpendicular holes and a straight antenna.

Each 436MHz element can then be slid into the boom, such that the same amount protrudes each side. Eventually, they will be fixed by drilling a small hole through the boom and into one side of the element, and securing with a self-tapping screw, but do not do that yet – we have to deal with the 145MHz elements first.

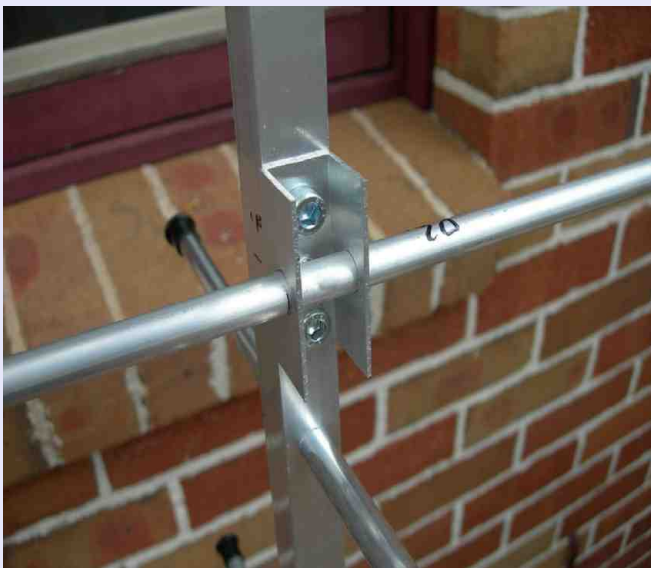
Your antenna should so far look like this. You will note I have fitted white plastic boom plugs (Bunnings) and plastic end caps to each element (again from Bunnings) except for the driven element. I would suggest only fitting the bung plugs after you have shaken all the swarf out!

436MHz elements installed

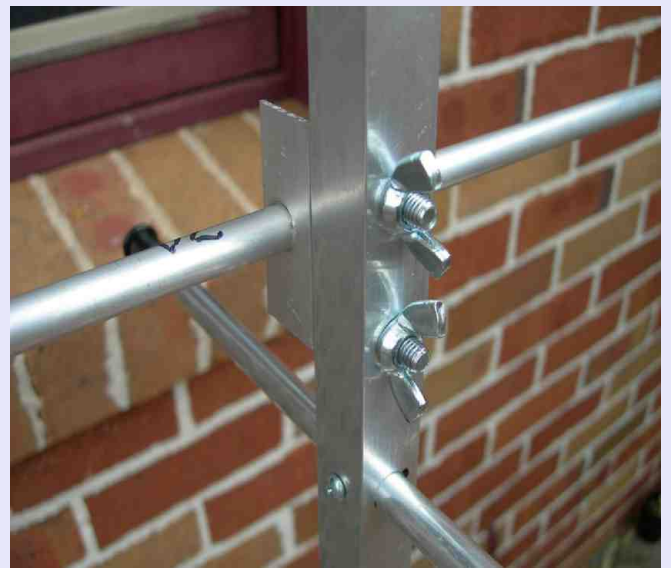
On my antenna, I made all the 145MHz elements removable for ease of transport. I achieved this by making a 'sub mount' for each element from a 50mm length of 20mm U channel aluminium from (you guessed it) Bunnings. A picture explains a thousand words, which is shown overleaf:

(see next page)





2m element mount from top side



2m element mount from lower side

To drill the U channel, slide each 50mm long section of U channel onto a piece of scrap wood trimmed to size, then centre punch the metal, and drill through both sides with a 10mm drill bit. The U channel is then drilled on the base, as per the pictures, each side of where the element passes through. I used M6 bolts and wing nuts. Each element is secured to the U channel by a small self-tapper from the underside (hence invisible in the pictures) of the U channel, and into one edge of the 10mm element. When it comes to getting the element to sit flush on the boom, you will have to counter-drill a hole slightly larger than the screw head on the boom to accommodate the protruding screw thread. Alternatively, you could use an Aluminium pop rivet and then perhaps just a dimple on the boom surface. All the U channel mounts for the 145MHz elements are drilled with M6 holes 30mm apart, so exactly between those two holes is the centreline on which the element holes lie, and where the element spacings are measured when mounted on the boom.

Again, looking from the 'far' end of the boom, the 145MHz elements mount thus:

From the very end of the boom, 160.0mm for D2

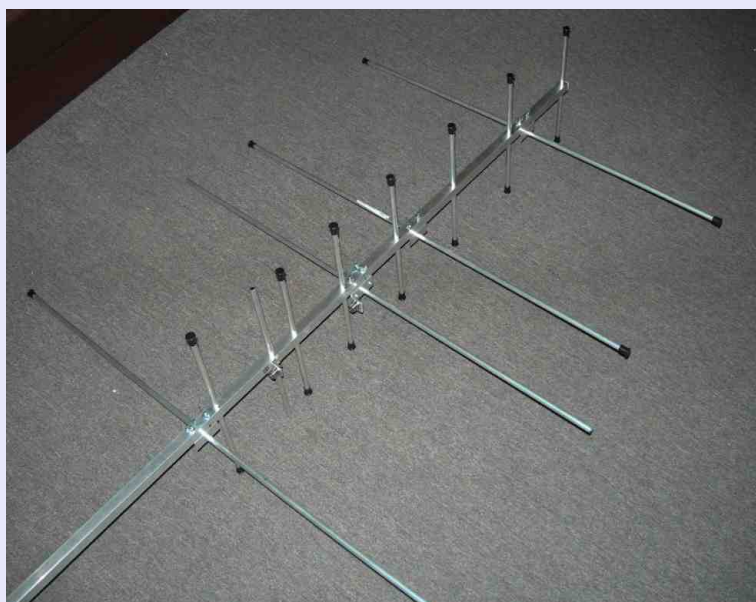
From D2, 373.0mm for D1

From D1, 162.5mm for DE

From DE, 379.5mm for Ref

You should find the 145MHz elements fit neatly between the 436MHz elements, as per the picture overleaf:

145MHz and 436MHz elements fitted

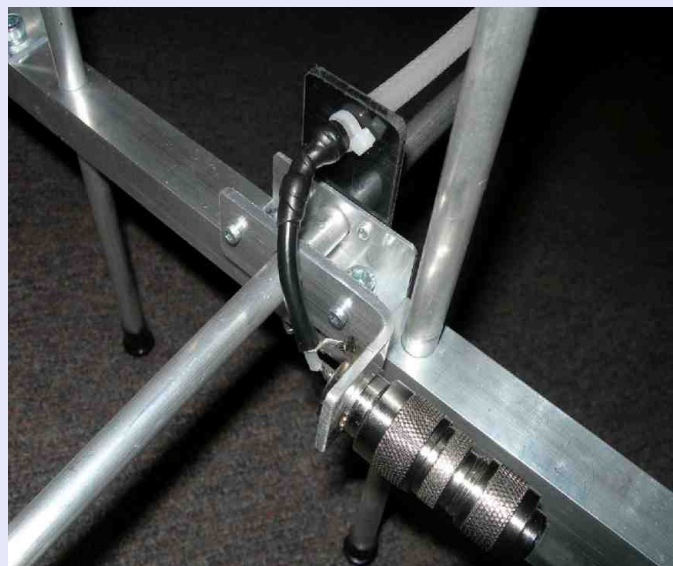


Again, you will see plastic end caps have been fitted to all but the driven elements.

I used N socket connectors for each driven element as shown in the picture above. The 436MHz N socket mounts on a small piece of angle aluminium (from Bunnings!) pop riveted or screwed to the boom just behind the driven element, as shown in the picture above. Try and aim that the brass solderable part on the back of the socket is 20mm out, radially, from the element when measured centre to centre.

The 145MHz N socket is slightly different – it has to be mounted on a small bracket fixed to the side of the U channel element holder, such that when the element is removed, the N socket comes with it. I used a piece of flat strip aluminium, bent 90deg, then drilled 10mm to slide over the element. This bent strip was then pop riveted to the side of the U channel. The photo below shows the 145MHz element with the N socket (and the gamma match) which we will come to shortly.

N socket mounting on 145MHz element



Now is the time to build the gamma matches. You will need approx 1m length of RG213, stripped of its insulation and braid, to leave just the insulated core. This is a nice sliding fit inside the 10mm tube. For the 145MHz gamma match, cut 230mm of this inner section of the coax, and for 436MHz cut 68mm of coax inner.

You will also need to cut some more sections of 10mm tubing from the scrap left over. For 145MHz, cut 150mm of tube, and for 436MHz, cut 50mm of tube.

Dealing with the 145MHz Gamma match first, as you will see from the photo above, I used a small scrap piece of 3mm thick Perspex, pop riveted to the side of the U channel element holder, drilled to slip over the element, and also drilled to allow the RG213 coax inner to pass through. This RG213 inner needs to be supported 30mm from the aluminium element when measured centre to centre. The short protruding end of the RG213 where it passes through the perspex plate is held in place with a cable zip tie, and the centre conductor is connected to the N socket with a short piece of RG58C coax.

The braid of the RG58C is only connected at the N socket end, and ends just before where the RG58C inner is soldered to the RG213. The whole lot is then wrapped in self-amalgamating tape to protect it. The 150mm length of Gamma tube is then slid over the RG213 inner.

At the other end of the Gamma tube, a moveable shorting bar is used, which during tuning is carefully moved to achieve best SWR before being clamped into position. Rather than a flimsy aluminium strap, I made some solid structural blocks from some scrap 50mm or so lengths of 16mm square section solid aluminium I already had (no luck this time, Bunnings!). I drilled two 10mm holes, 30mm apart (centre to centre) – one for the element, one for the gamma tube. I then drilled a 2.5mm hole through the centre that will take the clamp bolt, then carefully hack-sawed along the length of the shorting block, through the centreline of each 10mm hole. You now you have two halves, which can be clamped together with a bolt. In my case, I tapped one side so the bolt threaded into it, but you could enlarge the hole slightly, and use a small nut and bolt.

The 145MHz Gamma shorting bar looks like this, when mounted on the end of the gamma tube:

145MHz Gamma shorting block

The 436MHz gamma match is made the same way, except the RG213 coax inner is soldered directly to the brass centre pin of the N socket, to lie parallel to the element, this time spaced 20mm from the element, measured centre to centre, as shown below.



Direct connection to N Socket for 436MHz

As far as the positions of the Gamma parts go, my antenna tunes nicely as follows:

145MHz: The gamma tube is slid over the outer 48mm of RG213 coax inner, and the clamp is fitted 321mm out from the centre of the boom to the centre of the clamp.

436MHz: The gamma tube is slid over the outer 29mm of RG213 coax inner, and the clamp fitted 74mm out from the centre of the boom to the centre of the clamp.

Of course, your tuning may be slightly different based on your construction or measurement tolerances. To set up the Gamma matches, you will need an SWR meter, and a handheld radio. Tune the antenna by a combination of moving the shorting bar and the tube over the RG213 inner by small amounts, and finally clamping the shorting bar when you are happy at the lowest SWR at the desired satellite operating frequencies. The process is the same for both bands.

As far as operation with the antenna goes, initially I used a dual band hand held (Icom ICW-32E) with an Andrews duplexer. However, I still suffered de-sensitising on the 70cm Rx frequency when Tx'ing on 2m. I then came by another hand held, this time a Yaesu VX-6R. I have mounted this radio on the boom, for easy adjustment as the Rx radio for 70cm. The 2m radio now simply sits on my belt on a clip, and I use a speaker mic. The 2m radio needs no adjustment during the course of a satellite QSO, but the 70cm radio will need tuning to cater for Doppler shift during the pass. Having the radio in front of you mounted on the boom helps immensely. Also, using a speaker mic allows you to control audio feedback that might otherwise occur when you are hearing your downlink on a separate radio real-time as you are transmitting.

I also mounted a plastic handle that was taken from an old electric drill, and also an arm rest from a metal detector, to ease with holding and aiming the antenna during the satellite pass.



***Yaesu VX-6R (70cm Rx) mounted on the boom, with
Icom ICW-32E (2m Tx) that I clip onto my belt***

I won't go into how to operate the FM satellites, CTCSS access tones (like the ground based repeaters) or the theory of Doppler shift etc. etc. as this is all information that can be easily gleaned from the internet, as well as the AMSAT website.

However, I do encourage you to give the FM satellites a go with this antenna. I have worked VK's 1 to 8 and ZL with this antenna. All with an FM hand-held! It also makes a useful portable antenna for terrestrial use, although it may require a little re-tuning to work well in the SSB portions of each band.

If anyone needs any further information on the antenna, please drop me a line. I can be contacted via vklogger.com.au, or vk2gom@wia.org.au

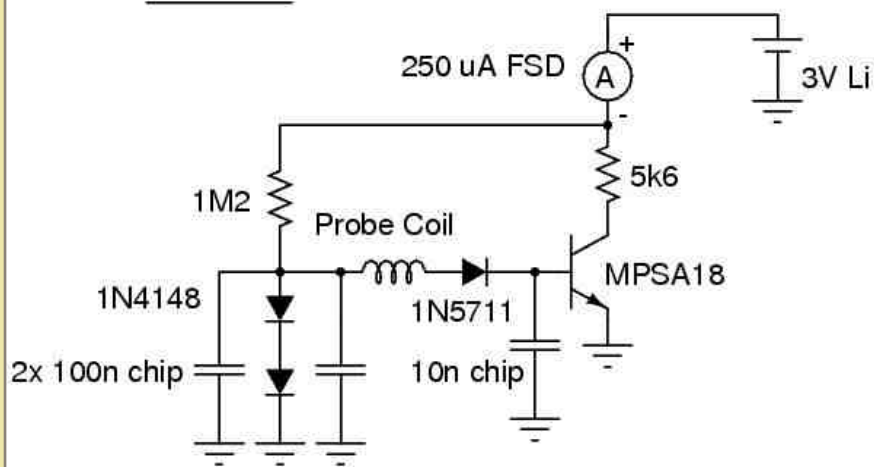
***73 – and hopefully see you on the air!
Rob VK2GOM***

RF SNIFFER

By Alan, VK2ZAY



RF Sniffer



Yet another circuit based on the biased 1N5711 detector topology. The only two differences in this circuit are the lack of a capacitor to resonate the pickup coil and I didn't add the pot to set the quiescent current, using just the 1M2 resistor to the diodes produced a reading just beyond "1" on the scale with the particular MPSA18 I used. Unplugging the coil is the off-switch, but the current consumption is tiny so I usually leave it plugged in.

The pickup coil is slightly exotic, having a jumble-wound LF/MF choke in series with a HF/VHF coil with a varying pitch along its length. The general idea was to try and produce a probe with several resonances in key bands to make the unit more generally usable with the single probe coil. The turns are held in place by dipping the coil in molten wax. Other coils can be attached, it uses an RCA socket like the HF wavemeter and the two units can share coils. I have several for specific purposes. Sensitivity peaks at the self-resonance of the coil and the stray capacitance of the circuit. The hybrid choke probe works fairly well from LF to SHF.

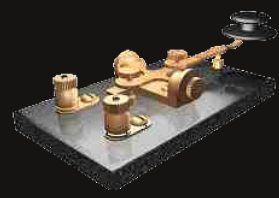


The microwave oven and WiFi base station are easily detected, showing the units SHF response. My various HAM transmitters happily slam the needle across HF to VHF and UHF. It picks up SAW-locked UHF keyfob transmitters, and even stray MF radiation from the LED multiplexing on the air conditioner control panel. LF radiation from 256 kHz contact-less proximity card readers is detectable quite a distance with the hybrid coil. It is often too sensitive, and a way to vary the sensitivity would be useful. A 5-10k pot in the right place would do the trick if you are building your own. This would increase its usability as a stray-current tracking tool in antenna work. A probe comprising a split ferrite toroid (clamp-on current probe) would also be quite useful but I haven't had the need to build one yet.

73 ! VK2ZAY



DX NEWS From the Web (opdx)



3B8, MAURITIUS (AF-049)

Mart, DL6UAA, will once again be back in Mauritius as 3B8MM beginning April 4th; duration will be 3 weeks. Activity will be on 160-10 meters mostly CW. Some SSB and Digital will be possible. QSL via DL6UAA, by the Bureau or direct.



3B8, MAURITIUS (AF-049)

Slavo, SP2JMB, will once again be active from here between April 7-14th, but as 3B8SC this time. Activity will be on all HF bands using CW. QSL via his home callsign. View photos of Slavo's 2008 trip and operation as 3B8/SP2JMB at:

http://www.sp2jmb.pl/index.php?page=g_mauritius_04.2008&LANG=eng



9H, MALTA

Steve, G0SGB, will be active as 9H3/G0SGB/p from Malta (EU-023, MIA MM-001, WLOTA LH-1113) between June 12-25th. He will also be active from Gozo Island (EU-023, MIA MM-004, WLOTA LH-0046) as 9H4/G0SGB/p. (No specific dates were provided). His activity will focus on lighthouse activations from Malta. QSL via his home callsign, direct only.



A5, BHUTAN

Steve, W7VOA, is scheduled to be active again as A52SW next month in Thimpu from about April 23rd until, at least, May 1st. Activity is planned for CW and SSB, primarily 80-10 meters. RF output is limited to 100w, and his planned antenna is a full-length G5RV. Steve informs OPDX that he will be the sole operator. This is a work trip, so his activity will be limited mainly on the weekends and during the evening weekday hours. Paper QSLs go to his QSL Manager K2AU and e-QSLs via the LoTW only. Steve states (edited), "Although my goal is to complete DXCC for the A52SW callsign. I'll be happy to work as many North American and JA stations as I possibly can."



A7, QATAR (Special Event)

Look for special event station A71RCAR to be active during the "2010 Regional Conference on Amateur Radio" in Doha, April 4-6th. This year's event is being hosted by the "Qatar Amateur Radio Society (QARS - A71A) in collaboration with the International Amateur Radio Union (IARU) in Region 1. A special QSL card will be available to commemorate this event. QSL via QARS Bureau: Qatar Amateur Radio Society (QARS), PO Box 22122, Doha, Qatar.



GB8, SCOTLAND (WFF Op)

Members of the GMFF team have applied for official permission to visit Rum National Nature Reserve (GMFF-058) located on the same name Isle of Rum (IOTA EU-008) and are planning to activate it between April 30th and May 3rd. They have applied for the special callsign GB8RUM to be used from the island during the DXpedition. More details are forthcoming on this WFF (New One) DXpedition. More information is available at: <http://www.gmff.org>



HB0, LIECHTENSTEIN

Marc, OZ1MDX, will be active as HB0/OU4U between June 22-27th. Activity will be on the HF bands using CW, SSB, RTTY and possibly PSK31. Direct QSL for HB0/OU4U is via Tim, M0URX (United Radio QSL Bureau). For Bureau QSL by E-mail requests, please visit:

<http://www.m0urx.com/qsl-request-form.html>



PJ5, ST. EUSTATIUS (NETHERLANDS ANTILLES)

Joe/W8GEX has announced (along w/co-leader Joe/AA4NN) that plans are in the works to activate St. Eustatius this autumn when it becomes a new country. Their plans include 10 days of operations, with an international crew of operators, and at least four stations on the air 24/7. Look for more details to be forthcoming.



T30, WESTERN KIRIBATI

Haru, JA1XGI/W8XGI, informs OPDX that he will be active once again from Western Kiribati as T30XG or T30/T32XG between June 3-9th. Activity will be on 40-6 meters, including 30/17/12m, using CW and the Digital modes. QSL via JA1XGI, direct or by the Bureau.



TM8, FRANCE (Special Event)

Members of the Radio Club Haut-Rhin (REF68) will activate special event station TM68X between April 5-18th. Activity is to celebrate "World Amateur Radio Day" on April 18th. The club will also organize a special exhibit at the MJC Fernand Anna de Wittenheim in Upper Rhine. QSL via F8BUO. Visit their Web page at: <http://www.ref68.com/expo>

For details on the IARU's "World Amateur Radio Day", see: <http://www.iaru.org/rel030418.html>



V2, BARBUDA AND ANTIQUA

Randy, WD8MGZ, will be active as V25WV from Codrington Village on Barbuda (NA-100) between April 24th and May 1st. For frequencies and schedules, use Twitter.com and search wd8mgz. Also, contact Randy via echolink (V21RW-R). He will be using a Icom 706 and a Yaseu 2 meter mobile. For more information, use the Web site: <http://home.comcast.net/~randylwilliams/site>



VP8, FALKLAND ISLANDS

Iain, M0PCB, is now active from the RAF Amateur Radio Club Station located at Mount Pleasant Airport using the callsigns VP8FIR or VP8RAF until April 7th. QSNs show that he has been on 15 meters CW. QSL via his home callsign. QSL cards will be printed once Iain is back in the UK.



WH0, MARIANA ISLANDS

Kuro, AL5A (JH0MGJ), will once again be active as WH0/AL5A from Saipan Island (OC-086), Northern Mariana Islands (KH0), between April 24-26th. Activity will be on 80-10 meters using CW and SSB. He plans to listen especially for "weak" European stations. QSL direct to JA7JEC. Send Bureau QSLs to the JARL Bureau to JH0MGJ.



ZL7, CHATHAM ISLAND

Operator Kaz Oya, ZL3JP, will be active from here between April 28th and May 3rd. He will use ZL7J, a special and temporary callsign issued only to ZL3JP for this operation from Chatham Island. Kaz is planning to arrive on Chatham Island (OC-038) on April 27th, and will be leaving on May 4th. Activity will be on 160-10 meters using CW and SSB. His QSL Manager is JH1HRJ. QSL by the Bureau, direct (w/SASE) and/or e-QSL is also planned.



ZS8M PIRATE?

Pierre, ZS1HF, reports this past week: "Hi All, Yes, in true tradition, we will have an idiot pirating my callsign - ZS8M. Shame on you! Please note....ZS8M will only be operational from approx 15 May 2010. Before I get operational, I will notify you all via qrz.com once I am ready. Please do not entertain any idiot pirating my call sign before I make the announcement. My technical training is progressing well. The complete team gathers on Tuesday 23 March in Cape Town to start team training - fire fighting, first aid and cooking.

73 for now..... Pierre ZS1HF"



THE DXCALENDAR

- 1/4 SEYCHELLES; S79GM

by GM0GAV and GM3YTS. Activity will be on all bands with an emphasis on the lower bands. Operations will be mainly CW with a possibility of some RTTY. They have tried to gain access to 7000-7050 kHz without any success, so look for them on 7050 or above and listening around 7025 kHz. They do have full access to 80m. There is a S79GM blog and the operators plan to update their QSX frequencies on that page. The blog page is <http://s79gm.blogspot.com/>

All QSOs will be uploaded to LoTW immediately upon their return home and they hope to be able to upload their logs during the DXpedition to <http://www.clublog.org/charts/?c=S79GM/>

- 1/4 BONAIRE, CURACAO; PJ4/OK7MT and PJ4/OK5MM SA-006

from Bonaire. They will participate in the Russian DX Contest (20-21 March) and the CQ WW WPX SSB Contest as PJ4L. QSL via OK7MT, direct or bureau.

- 1/4 GUATEMALA; TG9IRP

by IV3IYH including an entry in the CQ WPX SSB Contest. He will operate CW, SSB and RTTY on 80-10 metres. QSL via IK2ILH, direct or bureau (e-mail requests for bureau cards can be sent to ik2ilh@libero.it), or LoTW.

- 1/4 ARUBA; P4/DK1MM SA-036

including an entry in the CQ WW WPX SSB Contest as P41M. QSL for both callsigns via DK1MM.

1/4 - 2/4 COLOMBIA; 5K7SNC

from the Laguna Grande de la Sierra. Announced hours of operation frequency are:

April 1st - 7140 kHz between 1700-2400z

April 2nd - 7140 kHz between 0000-1700z

QSL via HK3OCH. For more details and possible updates, visit <http://www.qrz.com/> under 5K7SNC.

2/4 - 12/4 IRAQ; YI9PSE

A group of operators called the "YI9PSE DXpedition team" are planning to operate from Kurdistan. The team will receive a ten day visa issued by the Government of Kurdistan. A band/mode survey is available on their Web site at : <http://www.yi9pse.com/survey.html>

Suggested frequencies are also published on their Web page. The current updated YI9PSE Team consists of the following operators: N6PSE (Team Leader), N6NU, N6OX, W8HW, NI6T, AH6HY, N2WB, K3VN, JH4RHF and YI1UNH. Pilot stations are: N1DG, AA6G and JA1ELY. Online logs will be available during and after the DXpedition. QSL via N6NKT. For more details and updates, visit <http://www.yi9pse.com/>

- 2/4 TONGA; A33A OC-049, OC-123 and OC-064

by K6HFA. He will operate CW, SSB and maybe RTTY on 80, 40, 30, 20, 17 and 15 metres, with 100 watts and a vertical. Further information is expected in due course. QSL via home call.

2/4 RODRIGUES I; 3B9WR AF-017

from Cotton Bay, Rodrigues Island by G3LZQ. Activity will be on all bands 160-10 meters, probably and mainly CW, but with a focus on the lower band (QRN permitting). He plans to be on the air daily during his sunrise and sunsets (01.45 UTC and 13.45 UTC) and occasionally during his daytime Look for him to be in the RSGB's 73rd Commonwealth Contest (March 13-14th). QSL via his home callsign.

2/4 - 12/4 IRAQ; YI9PSE

A group of operators called the "YI9PSE DXpedition team" are planning to operate from Kurdistan. The team will receive a ten day visa issued by the Government of Kurdistan. A band/mode survey is available on their Web site at : <http://www.yi9pse.com/survey.html>

Suggested frequencies are also published on their Web page. The current updated YI9PSE Team consists of the following operators: N6PSE (Team Leader), N6NU, N6OX, W8HW, NI6T, AH6HY, N2WB, K3VN, JH4RHF and YI1UNH. Pilot stations are: N1DG, AA6G and JA1ELY. Online logs will be available during and after the DXpedition. QSL via N6NKT. For more details and updates, visit <http://www.yi9pse.com/>

4/4 - 6/4 QUATAR; A71RCAR

Special event station for the 2010 Regional Conference on Amateur Radio (RCAR), hosted by the Qatar Amateur Radio Society (QARS) in cooperation with the International Amateur Radio Union. QSL via the QARS bureau.

- 4/4 MALDIVES; 8Q7QX AS-013

by DL3OCH. He plans to operate mainly CW on 40-12 metres, with some activity on 80m, RTTY and PSK31. QSL via DL3OCH direct or bureau and LoTW. He will also operate EME along with 8Q7QQ (HB9QQ), 8Q7RQ (HB9CRQ) and 8Q7HP (DL2NUD). Information on the EME activity can be found at <http://mmonvhf.de/>

4/4 COLOMBIA; HK3JCL

by DK8LRF. He will operate SSB, Pactor, RTTY and PSK31 mainly on 20 and 40 metres. QSL via DK8LRF, bureau preferred.

4/4 ANTIGUA & BARBUDA; V21ZG NA-100

from Antigua by DL7AFS and DJ7ZG. Activity will be on 80-6 meters with operations mainly on RTTY, PSK and SSB. They plan to look for JA stations and QRP stations. QSL via DL7AFS.

6/4 - 12/4 WALLIS & FUTUNA IS; FW OC-054

by K6HFA. He will operate CW, SSB and maybe RTTY on 80, 40, 30, 20, 17 and 15 metres, with 100 watts and a vertical. Further information is expected in due course. QSL via home call.

7/4 SRI LANKA; 4S7ULG AS-003

by UX4UL. He operates BPSK, RTTY, CW on 20-10 metres. QSL via UY5ZZ.

9/4 - 2/5 REUNION I; FR/F5UOW AF-016

will operate mostly CW. He will be active on 20 metres until 17 April, then he will move to another QTH and operate as TO2R on 80-10 metres. QSL via home call.

11/4 - 17/4 MICRONESIA; V63DX, V63DQ and V63T OC-010

from Pohnpei by JA7HMZ (V63DX), JA1ADT (V63DQ) and JA7GYP (V63T). Activity will be on all bands and modes. QSL via their home callsigns.

7/4 SRI LANKA; 4S7ULG AS-003

by UX4UL. He operates BPSK, RTTY, CW on 20-10 metres. QSL via UY5ZZ.

13/4 - 21/4 TUVALU; T2 OC-015

by K6HFA. He will operate CW, SSB and maybe RTTY on 80, 40, 30, 20, 17 and 15 metres, with 100 watts and a vertical. Further information is expected in due course. QSL via home call.

14/4 - 19/4 TAIWAN; BW1/K8QKY

Activity will be on 160-6 meters using CW. QSL via his home callsign.

15/4 - 20/4 CANADA; CK8G NA-182

from Greens Island by VE8EV. Activated only once back in 1993, this IOTA group has been claimed by only 5.3% of current IOTA participants. He expects "around-the-clock propagation on 20m and will concentrate on Europe during their sunrise and sunset, North America during their sunset, and Asia right after their sunrise". He will operate SSB only using a 3-element yagi antenna and an amplifier. QSL via VE8EV direct or bureau. Updates and further information, including details on how contribute to this expensive operation, can be found at <http://ve8ev.blogspot.com/search/label/IOTA/>

20/4 SOLOMON IS; H44MS

by DL2GAC. On 6-19 February he will be going to the Reef Islands (OC-065), Temotu Province. QSL via home call.

ca 30/4 E. KIRIBATI; T32MI, T32SI, T32CI and T32VI IOTA NEW OC-279, OC-280, OC-281, OC-282

from Malden Island (T32MI), Starbuck Island (T32SI), Caroline Island (T32CI) and Vostok Island (T32VI) by SM6CAS, G3KHZ, G4EDG, 9M6DXX and K9AJ plus five Kiribati Government officials, will be leaving Christmas Island on a long voyage to the Southern Line Islands. They plan to be active on each island for four days with four stations from two operating sites on each island. QSL direct via SM6CAS. The voyage will be almost 1,800 nautical miles. Further information is expected in due course, bookmark <http://t32line.webnode.com/> for updates.

23/4 - 26/4 FIJI; 3D2 OC-016

by K6HFA. He will operate CW, SSB and maybe RTTY on 80, 40, 30, 20, 17 and 15 metres, with 100 watts and a vertical. Further information is expected in due course. QSL via home call.

23/4 - 1/5 BHUTAN; A52SW

by W7VOA. He will operate CW and SSB on 80-10 metres with 100 watts and a full-length. It will be a business trip and he will be active mainly on weekends and during his evening weekday hours. QSL via K2AU and LoTW.

24/4 - 26/4 MARIANA IS; AL5A/WHØ

from Saipan by JH0MGJ. He plans to operate CW, SSB and possibly other modes on 80-10 metres, with a focus on Europe. QSL via JA7JEC.

25/4 - 6/5 MARTINIQUE; FM/F5TGR

Activity will be limited to his spare time (holiday style) on 40-10 meters using CW and SSB. QSL via his home callsign, direct or by the Bureau.

25/4 - 16/5 CHINA; BY1DX/IØSNY

from Beijing. He will focus on 40 and 17 metres. QSL via IØSNY (direct only).

27/4 - 4/5 TUNISIA: TS8P and TS8P/p IOTA AF-083 and IOTA AF-092

from Djerba Island and Kuriat Island by IK7JWX, I8LWL, IC8ATA, IK8GQY (YL), IK8BPY, IS0AGY, IK2DUW, IW2NLC (YL), IK2GPQ, IZ7ATN, IK2PZC and IZ2GRG. Activity will be on all HF bands and 6 meters, using CW, SSB, RTTY and PSK31. QSL via IK7JWY.

30/4 - 2/5 UNITED STATES OF AMERICA; W1ACT NA-046

from Martha's Vineyard. Activity will include the New England QSO Party (May 1-2nd). Suggested frequencies are: 3540, 7040, 14040 and 14280 kHz. QSL via N1JOY: Roland Daignault, 19 Davis Rd, Westport, MA 02790-3433.

30/4 BAHAMAS; C6ANM NA-001

primarily from Nassau, 160-6 metres CW and SSB, including participation in the CQ WW 160-Meter DX Contests (CW and SSB) and in the ARRL DX SSB Contest. QSL via LoTW (preferably) or direct to WA2IYO.

1/5 WILLIS I.; VK9WBM

HF and 6 meter with 2 ele quad. QRV as time permits. QSL via VK4DMC.

1/5 - 27/5 GREENLAND; OX/KØKU NA-018

from Thule by NØRC. Activity will be limited as work permits, but he plans to be on every other day and try to get on the air for contest weekends, but he cannot guarantee this. Look for the log to be uploaded to LoTW and EQSL. QSL direct to NØRC or by the Bureau.

2/5 - 14/5 OGASAWARA; JD1BMH AS-031

from Chichijima Island by JG7PSJ. Activity will be on 40-10 meters (possibly 80m) using CW, SSB and the Digital modes. QSL via his home callsign. Visit his Web page for more details at <http://sapphire.es.tohoku.ac.jp/jd1bhm/index.html>

11/5 KENYA; 5Z4/LA9PF

He plans to operate on all bands and modes running 100 watts into a 3-element beam or a loop. He also expects to operate as 7Q7PF from Malawi during that time frame. QSLing information at qrz.com under LA9PF.

13/5 - 16/5 NEW CALEDONIA; FK/W3HQ OC-033

from Lifou, Loyalty Islands by W3HQ and VK2DON. Their activity will be on 40/30/20 meters using CW only. QSL via W3HQ.

15/5 PERU; OA4/DL5YWM

He plans to operate in his free time from Lima. Side trips to different call areas are possible, as well a "last minute" operation from an island.

18/5 - 19/5 SAMOA; 5WØOX OC-097

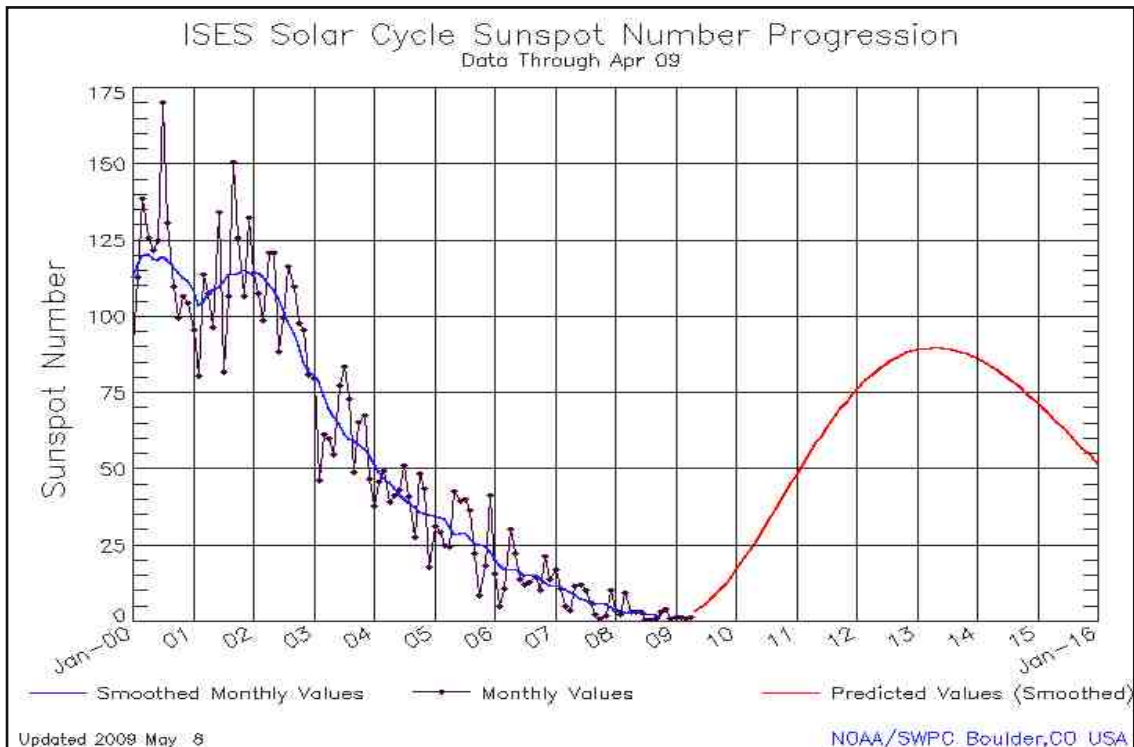
by UX0HX, RK3FA, UR3HR, US7UX, UT1HF and UT5UY. They will operate CW, SSB and digital modes on 160-10 metres. QSL via UR3HR, direct or bureau. More information, including details on how contribute to the expedition, at <http://www.uz1hz.com/pacificodyssey.html>

18/5 MALDIVES; 8Q7IA AS-013

by UX4UL. He operates CW, SSB and BPSK on 40, 20 and 17 metres. QSL via UY5ZZ.

CONTESTS OF APRIL

From	To	Contest	Mode
3/04/2010 00:00	3/04/2010 04:00	LZ Open 40m Sprint Contest	CW
3/04/2010 15:00	4/04/2010 15:00	SP DX Contest	CW/SSB
3/04/2010 16:00	4/04/2010 16:00	EA RTTY Contest	RTTY
3/04/2010 18:00	4/04/2010 24:00	Missouri QSO Party	CW/Phone
10/04/2010 07:00	11/04/2010 13:00	Japan International DX Contest	CW
10/04/2010 12:00	11/04/2010 12:00	Radio Maritime Comm. Day	CW
10/04/2010 12:00	10/04/2010 17:00	DIG QSO Party (10-20m)	CW
10/04/2010 16:00	10/04/2010 19:59	EU Sprint Spring	CW
10/04/2010 18:00	11/04/2010 23:59	Georgia QSO Party	CW/Phone
11/04/2010 06:00	11/04/2010 10:00	UBA Spring Contest 80m	SSB
11/04/2010 08:00	11/04/2010 18:00	International Vintage Contest	SSB/CW/AM
11/04/2010 07:00	11/04/2010 09:00	DIG QSO Party (80m)	CW
11/04/2010 09:00	11/04/2010 11:00	DIG QSO Party (40m)	CW
17/04/2010 00:00	17/04/2010 23:59	Holyland DX Contest	ALL
17/04/2010 00:00	17/04/2010 24:00	TARA Skirmish Digital Prefix	DIGITAL
17/04/2010 05:00	17/04/2010 8:59	ES Open HF Championship	CW/SSB
17/04/2010 16:00	17/04/2010 19:59	EU Sprint Spring	SSB
17/04/2010 16:00	18/04/2010 04:00	Michigan QSO Party	CW/SSB
17/04/2010 17:00	17/04/2010 20:00	EA-QRP CW Contest (1)	CW
17/04/2010 18:00	18/04/2010 18:00	Ontario QSO Party	CW/Phone
17/04/2010 20:00	17/04/2010 23:00	EA-QRP CW Contest (2)	CW
18/04/2010 07:00	18/04/2010 11:00	EA-QRP CW Contest (3)	CW
18/04/2010 11:00	18/04/2010 13:00	EA-QRP CW Contest (4)	CW
24/04/2010 12:00	25/04/2010 12:00	SP DX RTTY Contest	RTTY
24/04/2010 13:00	25/04/2010 12:59	Helvetia DX Contest	ALL
24/04/2010 16:00	25/04/2010 21:59	Florida QSO Party	CW/Phone
24/04/2010 17:00	25/04/2010 17:00	Nebraska QSO Party	CW/Phone
26/04/2010 00:00	30/04/2010 23:59	EUCW/FISTS QRS Party	CW



GO SW - SOME DX NEWS BY OZ6OM

Tonga, A3, [Update].

Paul, A35A, informs OPDX on December 2nd, that Dave/W6ZL (A35KL) was leaving Ha'apai on December 3rd. Dave should be in New Zealand by the time you read this. Paul states, "Dave probably won't be QRV again from Tonga until perhaps April 2010. He may be able to get on the air from ZL, when he visits some of his radio buddies down there. I'll let him fill you in if/when that happens." He also mentions, "All antenna work here at A35A is 99% complete. The SteppIR yagi (w/6m add-on) is up and working fine; the 4 element 6m beam has been cleaned up and is working fine; the SteppIR BigIR vertical (w/80M add-on) is up, but I still have some tweaking to do on the elevated radials to get a good impedance match. I intend to be more active from now on, especially on 80m. I want to finish up on 5BDXCC before my QSL manager (W7TSQ) gets tired of waiting! HI... The 6m Es season is fast approaching down here, so that should provide some excitement...especially since both North and South Cook Islands (E51CG and E51WL) are now QRV. Incidentally, our announced move to Vava'u has been postponed indefinitely, and perhaps cancelled altogether. A35A remains QRV from Lifuka Island, Ha'apai until further notice. QSL via W7TSQ or LoTW

Antigua, V2.

Operators Babs/DL7AFS and Lot/DJ7ZG will be going on another DXpedition, but this time to the Caribbean region. Look for them to be active as V21ZG from Antigua between March 16th and April 4th. Activity will be on 80-6 meters with operations mainly on RTTY, PSK and SSB. They plan to look for JA stations and QRP stations. QSL via DL7AFS.

Maldives, 8Q. [Update].

As well the Team will try to setup a MMonVHF DXBlog to spread their latest News: <http://www.mmonvhf.de/showblog.php?ca=8Q7QQ> We are now in the final stage of preparations for our Maldives Islands 2010 DXpedition. QTH: Island of Velidhu, Ari Atoll (MJ64je) Date: We arrive on the island March 21st. Once there we will start to build the 4 stations. We expect to be QRV from March 23rd moon-rise to March 31st moon-set. On April 4th we will be flying back to HB9. Team: HB9QQ Pierre, HB9CRQ Dan, HB9EHJ/DL3OCH Bodo and DL2NUD Hermann and Silvana (XYL of Dan) - Call: All operators will have a 8Q7 license and call. We expect to use 8Q7QQ on all the bands. For more detail do have a look at: <http://www.mmonvhf.de/latest.php?id=2896>

Maldives, 8Q.

Dan, HB9CRQ, did send MMonVHF an first Pre-Announce for the upcoming EME Expedition to th Maledives Islands in march 2010. Operator will be of Pierre, HB9QQ and Dan, HB9CRQ and maybe other Members of the HB9Q Team. Mainwork will be 144 MHz but as well 6m and 23cm band will be joined. If there are more Operators maybe as well 70cm will be activated (if any OP will have interest to join the Team please pass an info to Dan, HB9CRQ). Flights and Bungalows are booked already. Soon MMonVHF will spread out more detailed informations (<http://www.mmonvhf.de/latest.php?id=2896>) tnx to Dan, HB9CRQ, Team of HB9Q direct to MMonVHF

Turks & Caicos, VP5.

By W5CW; QRV Mar 23 - April 6 as VP5/W5CW before/after WPX on 160 - 6 Meters CW/SSB; focus on WARC. Special Callsign in WPX will be VP50V (VP Fifty V.) QSL via Box 88, Morris, OK 74445-0088. (Maurice, F5NQL)

Denmark, OZ.

Hello Guys, I (OZ6OM) will be QRV in the Nordic Activity Contest Thursday evening (April 8th.) between 18 and 22 UT. I intend to be QRV from JO55EJ at an alternate QTH running 100 w. into a 5 or 6 element Yagi. In any case I intend to keep activity round 50.173 MHz (SSB/CW) and 50.230 MHz / 50.236 (JT6m). I'm open for skeds at CW/SSB the first 2 hours, and JT6m the last 2 hours. I can be reached at email oz6om(at) uksmg.net prior to the contest and SMS +45 2066 7388 during the contest.

(One of the reasons I'm operating this way is, my attempt at setting up reasonable antennas at my QTH have so far ended in a law suit (Latest, case filed at the domestic court) Hope to see You down the log ...

vy 73 de Matt OZ6OM - 8 Apr. 2010

England.

G. Ian G6TGO writes, I am arranging a UKSMG Stand at the NARSA Exhibition in the North Western part of England, on the 11Th of April 2010. This will be the very first UKSMG Stand at this Rally. I will be arranging a live WSPR station however it is unlikely that there will be many people about on WSPR as here in the north we do not have any WSPR stations on 6m, except me and G3ZOD 11Km away!

So I have arranged possible (EI) Irish help in ensuring some activity on the day for demonstration purposes. A Halo will be the Aerial in use.

Ogasawara, JD.

Operators Stan/AC8W (JD1BNK), Ted/K8AQM (JD1BNM), Steve/K8QKY (JD1BNQ) and Brian/KG8CO (JD1BNJ) will be active from Chichijima Island as part of the "JD1 Project 2010" between March 28th and April 12th. Activity will be on 160-10 meters using CW, SSB and RTTY.

Each operator will be active as follows: JD1BNJ - Only RTTY and PSK31. JD1BNK - Mainly CW on the HF bands. JD1BNM - Mainly CW on the lower bands. JD1BNQ - Mainly CW on the HFbands and 6m.

QSL via K8AQM, direct, by the Bureau or LOTW

France, F.

The French TM5EL DX Group will be active on Sein Island in France on 7 - 14 April (Loc: IN78NA) TM5EL will be active on the HF bands, 6m, 2 m, 70 cm, and 23cm using SSB, CW and digital modes. QSL via F6KHI, direct o via bureau. Operators: F4BCG, F4FCS, F5RAB, F6AXN, F6DXE, D6DPD, F8AEJ

Taiwan, BV.

Steve, K8QKY will be active from the island of Taiwan (Grid square PL04) as BW1/K8QKY from 14-19th April 2010 QRV 160-6 metres, CW only. QSL via home call

Solemon Isl., H40. [Update].

After the great success of his last H40FN DXpedition to Temotu OM Siegfried,DK9FN, decided to make another DXpedition there this year. He will be accompanied by Hans-Peter,DG1FK (H40FK), and Bernhard,DL2GAC (H40MS), who is staying in the Solomon Islands since Jan 21 and will be QRV again as H44MS after Temotu until Apr 19. The trio will show up from Ngarando Reef from Feb 6-19. H40MS will be active in SSB, H40FN in CW and H40FK in digital modes. Their antenna is a multiband 2 ele vertical "Lobster" for 160m-6m. The antenna was described in the German magazine CQDL 12/2009. QSL cards for H40MS and H40FK should be sent via their homecalls. The QSL manager for H40FN is HA8FW.

Updates can be found online at: http://www.hari-ham.com/seiten/h40fn_2010/index.php

Bahama Isl., C6.

Tom, C6ANM will be active from January through April 160-6 metres CW and SSB, including participation in the CQ WW 160-Meter DX Contests (CW and SSB) and in the ARRL DX SSB Contest. He will primarily operate from Nassau. QSL via LoTW (preferably) or direct to WA2IYO

What is a "Good Ground?"

By Joseph J. Carr



One of the universal bits of advice given to amateur radio operators and shortwave listeners is to provide a "good ground" for their transmitters, receivers and antennas. A number of antenna designs, especially those that are unbalanced with respect to ground (e.g. Marconi style antennas), require a connection to ground in order to function correctly. Even balanced or "Hertzian" antennas work better if the receiver or transmitter is grounded.

The problem is that many books and equipment user manuals ask you to provide a "good ground" but don't say what constitutes a "good ground." Let's take a look at the issue.

A Good Ground Connection

A good ground is one that has a low resistance to the Earth at radio frequencies. A ground that is good enough for DC or low frequency power lines (60 Hz) is not necessarily a good ground at radio frequencies.

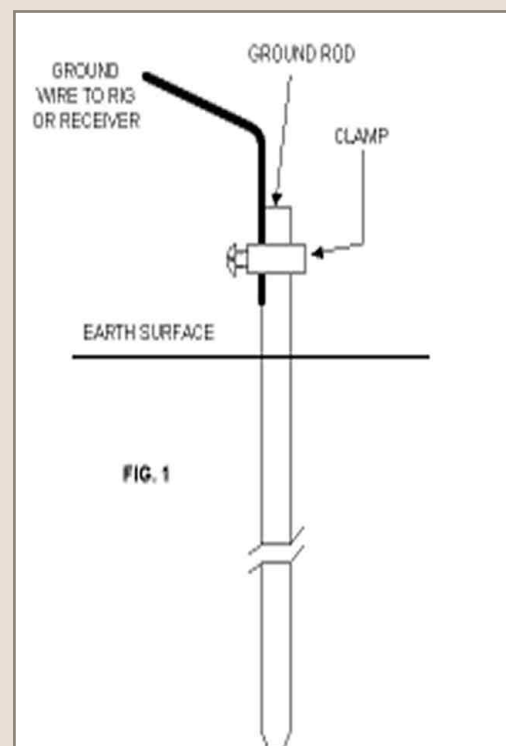
Figure 1 shows the most basic form of radio antenna ground. A conductive ground rod is driven into the Earth for a certain distance. Some people use short rods, such as the 3-foot ground rods used for television antennas, but that is not the best solution. A proper radio ground for high frequency (HF) band operations should be 8-feet long. Anything less than that usually results in poorer performance, and may not provide proper lightning protection. Indeed, the shorter size ground rods might not even be legal (your local electrical inspector may have an opinion or two on this matter!).

Some ground rods are made of copper, but many of them are made of copper clad steel. Such rods are made of a steel core with a thin layer of copper on the outer surface. The low resistance copper is sufficient because RF currents flow on the outside of a conductor (a phenomenon called "skin effect").

The ground rod is driven into the Earth within a few inches of its top, and then a wire clamp is fastened. This clamp is used to hold the ground wire fast to the ground rod.

Soldering is usually out of the question because the Earth and the rod make a dandy heat sink, making unlikely that you can reach solder melt temperatures with anything less than propane torch (it can be done, however).

Hint: From harsh experience let me give you one pointer: slip the wire clamp over the ground rod before you start pounding the rod into the Earth. Repeated blows with a hand sledge hammer are required to drive the rod down into the soil, and those blows will splay the top end of the rod. When this happens the clamp will not have sufficient inside diameter to slip over the top of the rod. If you wish to keep the wire clamp from banging around as you hammer, then temporarily fasten it to the rod with its own screw, or with some masking tape.



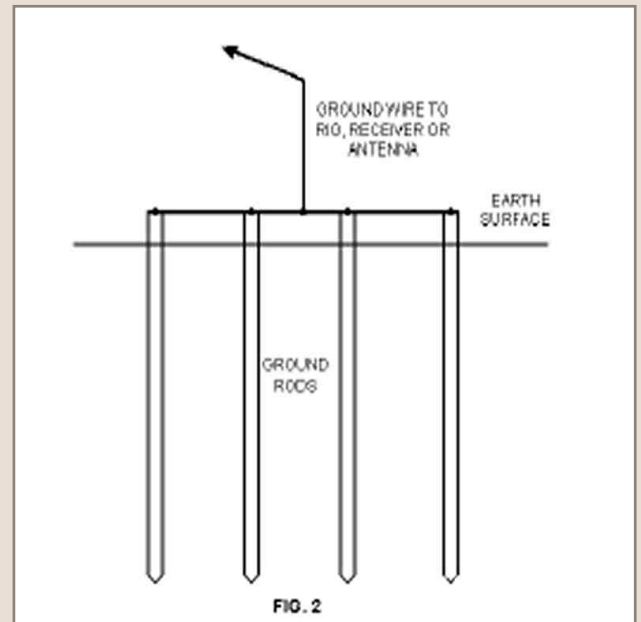
A few ground rods are made of copper tubing. These grounds are made of 1-inch or larger copper pipe, and should be of thick wall stock rather than ordinary plumbing water pipes. While there is an argument that copper tubing makes a better ground than rods, they are also the very devil to install (later we will deal with an exception).

The ground system shown in **Fig. 1** will suffice for most amateur and SWL applications. Some people go to extremes, however. When I was a Novice ham operator in the late 1950s there was a senior ham ("two-letter call") named Abe in our neighborhood. He made his living building houses, so had built his own. When he had the backhoe dig the basement and foundation footers, he also had it hog out a subterranean alcove for his special breed of "ground rod." Abe placed an antique copper or brass bathtub in the hole, and then covered it with earth when he back filled against the foundation. Of course, the future monetary value of that buried antique bathtub was not a consideration to a died-in-the-wool ham operator!

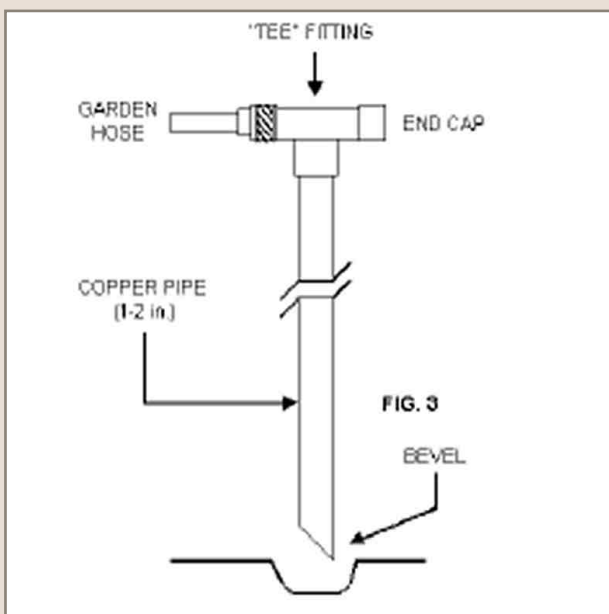
Another chap went to his newly built house before the sod was laid down. He installed a grid of bare copper wires spaced about one yard (36-inches) apart. At each crossover juncture the wires were silver-soldered together. At the entrance of the house where the ham rig's wires would emerge he installed a series of six eight-foot ground rods arranged in a triangle like the Greek letter delta (D) when viewed from above. Both of those approaches may be a bit of overkill.

The wire clamp is a special fitting intended to fasten the ground wire from the receiver, transmitter or antenna to the ground rod. The clamp is a collar that goes around the ground rod, and has a set screw on one side. When the set screw is tightened it forces the wire tightly against the pipe.

A lower RF resistance can be obtained by using multiple ground rods (**Fig. 2**). This system is recommended by some lightning protection experts. Each ground rod is the normal 8-foot long. They are joined together at the top by a heavy copper wire that shorts all four rods together. The best operation is afforded when there is a spacing of 1 to 3 yards between rods. This spacing argues for the triangular or circular pattern, rather than the inline. You will find such systems discussed in books on lightning protection.



The Hard Cases



I live in northern Virginia, where my cattle thief ancestors settled after being run out of Scotland before the American Revolution. A large amount of land in this area consists of an overburden of good, rich soil...about 12 to 36 inches deep. Underneath that wonderful soil is a couple meters of white marine clay that is as hard as nails. When I moved my family into our first house, I attempted to install an eight-foot copper clad steel ground rod beneath the window where my ham shack would be located. After three hours of unaccustomed hard labor my son ran into the house yelling "...Mommy! Daddy's using those words again!" That marine clay would not budge!

Some years later, when I built an addition on the house, a contractor lost his shirt on digging the footers for the concrete slab the addition rested on.

He bid the job assuming that two laborers with shovels could dig out the required 28-inch deep by 12-inch wide trench in about three hours. It took two days...pick and spade work against that marine clay for the last few inches.

Later, before I tried to install another ground rod, I got some advice from a reader of one of my magazine columns. He recommended using a homebrew water drill (**Fig. 3**). The “drill” is a 1.5-inch diameter copper pipe (plumbing pipe will do), bevelled at one end by a hacksaw. At the other end a “tee” junction is sweat soldered. One side of the tee is fitted with an end cap (also sweat soldered). The other end is fitted with a standard nipple for a garden hose. By placing the beveled end into the soil, and then turning on the water at its 5 highest pressure, the pipe was able to slip into the ground at a rate of about half inch per second. Slow, but one heckuva lot faster than the “bang-bang” method.

Artificial Ground Tuners

Sometimes the reason why a ground is not so good is that the ground wire is too long. Any time the wire is an appreciable fraction of one wavelength, it will be a poor ground at least on some frequencies. One approach is to insert an artificial ground tuner between the ground side of the antenna tuner or transmitter. The artificial ground tuner consists of a series resonant tank circuit and an RF ammeter. The tuner is adjusted to maximize the flow of current in the ground wire.

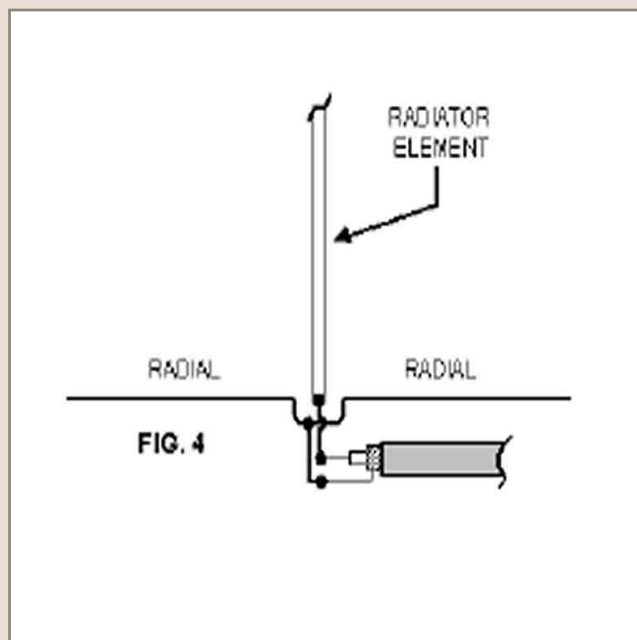
Counterpoise Grounds

A “counterpoise” ground (**Fig. 4**) is one that is an artificial ground plane. The vertical antenna is familiar to most ham operators and SWLs. It consists of a vertical radiator (usually, but not always, quarter wavelength long). The center conductor of the coaxial cable feedline is connected to the vertical radiator, while the shield is connected to ground.

In some cases, especially if the vertical is mounted above the surface of the Earth, a “good ground” is virtually impossible. As a result, antenna installers use a system of radials (**Fig. 4**), each quarter wavelength long, all tied to the ground point of the vertical, as the counterpoise ground. Use at least two radials per band, although the more the merrier. Medium wave AM broadcast stations in the USA must install 120 radials to comply with engineering standards, but ham/SWL sources usually recommend sixteen or less. The reason is that it is a lot of effort to install more than that, yet there is a “knee” in the performance gain experienced over that number so a “diminishing returns” situation exists. The radials can be either perpendicular to the radiator element or, as shown, they can droop up to 60 degrees from horizontal.

It is also possible to install the radials on the surface, or buried a few centimeters below the surface. The latter is preferred for safety reasons. Pedestrian traffic in the yard can easily trip over the wires laid on the surface. Indeed, it could be you! In that case, while you are waiting for the emergency medical technicians to arrive with their splints, bandages and ambulance, you can hear your kid say: “Mommy, what’s those words Daddy’s yelling?” To which mom replies: “He’s inventing new curve words.”

Figure 5 shows the method for connecting ground level or buried radials. The ground rod is a standard 8-foot or longer ground rod (again, copper clad steel). The radials are fastened under a wire clamp. Either the same one as the ground wire to the antenna and/or rig can be used, or a separate clamp provided.



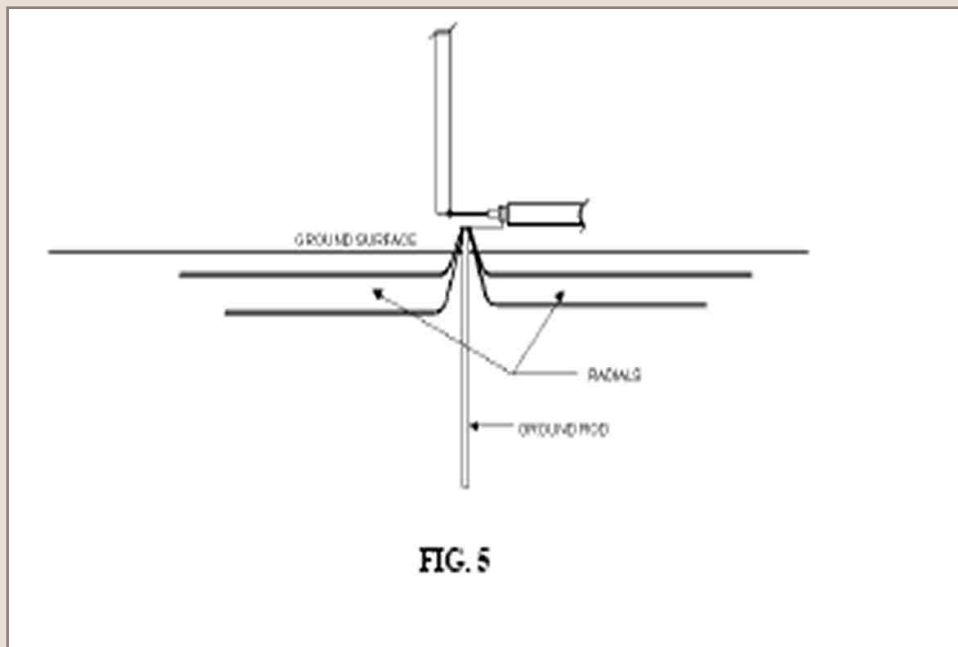


FIG. 5

The same ground system can be used for nearly all Marconi style antennas, not just verticals.

Lightning Arrestors

Lightning is not attracted to radio antennas unless the antenna is one of the highest points around. Unfortunately, that's where antennas work best: up high. Because of this problem, it is necessary to provide some protection against lightning strikes.

Get one thing straight right away: a direct hit on your antenna will destroy the antenna and the radio equipment connected to it. It might also set fire to your house. No amount of protection will guarantee that no damage will occur, but you can mitigate the damage by taking certain steps. Also, a lightning bolt need not strike the antenna to damage radio equipment. A lightning bolt that strikes the ground nearby, or strikes between two clouds overhead, will produce a high enough electrical field to put very high voltage spikes into the receiver front-end. Older vacuum tube equipment was relatively immune to such transient voltages, but modern solid-state equipment is sensitive.

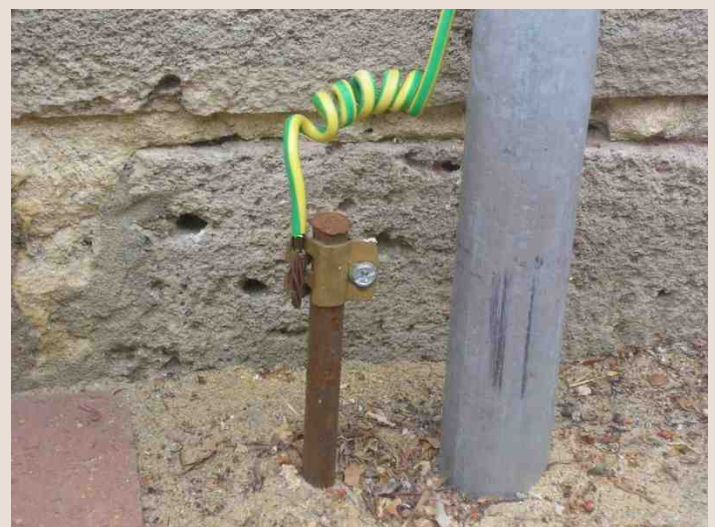
All antenna installations should have a lightning arrestor either in the feedline or at the base of the antenna in the case of verticals. Your radio dealer can sell you approved types. The lightning arrestor should be installed outside of the house, and be well grounded.

Note: In many cases your homeowners insurance may not pay off in the case of lightning damage if you failed to use an approved lightning arrestor properly installed. Some companies also require that the installation be inspected by the local government electrical inspector.

Conclusion

If you follow the principles discussed in this paper, you should achieve a good ground, with the expected improvement in the performance of receivers, transmitters and antennas.

Best regards.



The History of Torre Bert From Astrosurf



PART 2

Analyze and reactions

What to think about these alleged "tovaritch kosmonautov" in distress ? We know indeed that some Russian crews and even a dog, Laïka, died during the first missions but these news facts reported by the Judica-Cordiglia brothers are unknown from archives. The sole sources converging in this direction are... TASS and the Chinese Space Agency that recently claimed that the Soviets launched and lost several "secret cosmonauts" before and after the flight of Gagarin. Who can ever confirm these facts ?... We need proofs and evidences, not speeches !

The records made by Judica-Cordiglia brothers highlight another problem. At the beginning of the space conquest, heartbeats rate and breathing were never transmitted to ground stations using the audio downlink, there was only one case, in 1979 by Salyut-6.

On the Vostok-1 and Voskhod-1 orbiters for example used in 1961 and 1964, these biomedical data were transmitted through the telemetry at 19,9994 MHz. Only audio contacts, like this one between Bykovsky and Krutchev in 1963 where established on AM at 20 MHz with visual control on TV cameras transmitting images by shortwaves, then demodulated. Let's recall in a few lines how worked this communication network.

Short history reminder

First soviet space communications like the ones of the other nations were established on HF and VHF frequencies. The cosmonaut ensured a two-way radio communication link with soviet ground stations located at the Central Control Room in Moscow, at the cosmodrome, as well as at remote sites located across Russia : Novosibirsk, Kolpashevo, Khabarovsk and Yelizovo.

The radio communication links were carried out on various frequencies ranging between 9 and 20 MHz, as well as on VHF on 121.750 and 143.625 MHz. They never transmitted voice on higher frequencies. UHF bands were used to transmit telemetry during the Moon missions (e.g. on 768 and 922 MHz) while microwaves were used with transponders tuned on S-band between 2.8-2.9 GHz. Some landing radar installed onboard the first Luna spaceprobes worked also on X-band at 9.2 GHz..

To come back to Vostoks, the satellite tracking was carried out from ground stations on the HF frequency of 19.995 MHz or 20.008 MHz in FM mode. This channel was used for reliable contact up to distances of 1937 km (1204 miles). When the crew was out of this range an onboard tape recorder was used. The same frequencies could be also used for the audio but then in AM mode. No Soviet crew never worked in SSB mode, excepting the american Apollo crews.

Usually audio signals were transmitted on 20.006 or 18.035 MHz, sometimes on 17.365 MHz. Gagarin for example transmitted his famous comments on 19.995-20.005 MHz in AM mode, conversations that any listener could easily capture on a portable receiver equipped with a longwire antenna as soon as the orbiter was over the horizon.

Beside the tracking and the audio channels, telemetric medical datasets were sent in FSK-PDM or CW-PDM mode. FSK mode is a very efficient method of transmission because, like CW, it uses a very narrow bandwidth (~1 kHz) and could easily be heard far beyond the horizon and through interference. At some occasions, FSK signals travelled all around the Earth thanks to ducting properties of the ionosphere layers.

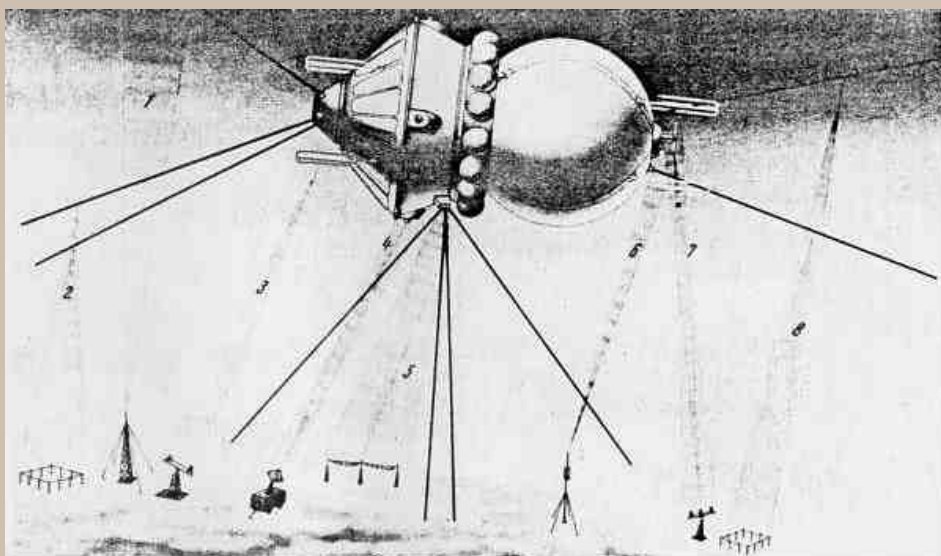
The FSK-PDM mode was supplemented by the two TV cameras (remember videos of Gagarin), which provided a frontal and a profile view of the actions and reactions of the cosmonaut in orbit.

We can see on the drawing displayed at right that Vostok orbiter was equipped of four large stick antennas of approximately one meter long, displaying thus broadband characteristics (tubing of large diameter), and tuned on VHF frequencies. From a CIA article entitled "Snooping on Space Picture" published in "Studies in Intelligence" in 1964, we learnt that these TV antennas worked on 83 MHz, thus the antennas were cut at $l/4$.

The telemetry was sent on 19.995 MHz or 20.008 MHz or a near frequency. Later, telemetry signals from Cosmos orbiters were sent at 66.2 MHz wideband (Cosmos 353, 1970) as well as on digital format at 19.150 MHz (Cosmos 376, 1970). A two-tone biomedical beacon sounding like CW was also transmitted at 19.948 or 19.995 MHz or a near frequency.

Sensors attached to the cosmonaut's body under the suit recorded pulse, respiration, blood pressure and electrocardiogram. It is obvious that these data cannot be transmitted by voice. There is however one mission at least during which the voice channel carried out biomedical data; on May 11, 1979 Salyut-6 transmitted electrocardiograms on the voice channel on 121.75 MHz. But at that time Torre Bert was already dismantled for a decade.

Drawing, which source is unknown, showing the various communication links installed on Vostok orbiters. The four large sticks set up at the ends of the orbiter ensured TV transmissions and maybe other services with ground stations in VHF frequencies. Clic of the drawing for the legend associated to each number.



1. Transmission of operational telemetry from onboard the spacecraft
2. Reception of terrestrial broadcasting stations
3. Transmission of telemetry and television images from onboard the spacecraft
4. Measurement of the orbit of the spacecraft
5. Two-way telephony and telegraphy shortwave communications
6. Command reception
7. Two-way VHF telephony
8. Transmission of operational telemetry and telegraphy information during the landing phase

About the antennas and frequencies

In some interviews, Gian Battista Judica-Cordiglia said that his dipoles arrays were not very efficient. If we check the building (see previous page) it is a fact that the gain could never reach high values. The "parabolic dish" 12 meters wide looks more like a plane surface - and it is - or even more to a ground plane antenna ! Radiation pattern was directional of course, but with a wide open lobe and vertically polarized... Not much relations with space communications, excepted that it is tilted on its base to track easier satellites crossing the sky over northern Italy. According to Judica-Cordiglia brothers, this antenna was modeled after one used by a NASA tracking station in Africa and was modified after the initial trials.

Remember however that Torre Bert used also an helical antenna system placed at center of the "ground plane", more suited to capture satellite emissions on VHF bands as well as several other short VHF Yagis.

But even if the six stacked Yagis are well cut on the respective working frequencies, the complete system could not work on the alleged bands. Let's check each of them.

108 MHz was indeed a space radio band in the 60's for the US spacecrafts. 137 MHz also, this is a standard space frequency, mainly use by weather satellites.

405 MHz has never been a band allocated to space communications. It was a military band (Army), then shared with private services (today meteorology and medicine).

145.8 MHz at last, is a primary ham band not reserved to space communications. More, the facsimiles transmitted by Kosmos and other spacecrafts were sent on 163 MHz and on 183.5 or 183.6 MHz for the Luna E-6 serie probes... This last frequency was confirmed on April 8, 1963 in the article published in "Aviation Week & Space Technology" entitled "Soviets Launch Lunik 4" . In these conditions how Torre Bert could receive their so-called "APT-like" pictures on 145.8 ?

In addition, as far as we know, these lunar probes never transmitted image (ATP) during the approach phase but only after their soft landing.

Torre Bert needed also of a demodulator to process the ATP signal, then they had to re-compose the tape recording on a TV monitor, and from there, record the signal with a camera (plugged in aux or directly from the screen). Gian confirmed that this is well what they did but he didn't never extend on the frequencies used.

At last, and this will close the discussion, with their receive system there are few chance that Torre Bert was capable to pick up the weak signals sent with a power of 10 W by Luna-4 orbiting the Moon. It should arrive at their antenna with a power of only 0.1 microwatt, the equivalent of a loss of 80 dB !

With such losses it was impossible for them to receive slow-scan pictures from over 100 km away in such conditions. They 'd use many more stacked antennas using many more elements, equipped of efficient preamplifiers and very sensitive receivers. Only a radiotelescope or a very expensive amateur installations (EME) equipped with weak signal processing systems could ensure such tasks. In the 1960's only national agencies could support such projects and some fortunate radio amateurs able to build an array of some tens of Yagis steerable in azimuth and elevation.

Extract of the The Electromagnetic spectrum PDF file. The alleged 405 MHz band used by Torre Bert for space communication falls just in a military band... Even in 1961 they had not a chance to capture here the least audio, telemetry, video or APT signal from a spacecraft !



Sven Grahn works for the swedish space program and has recorded many transmissions from various spacecrafts since 1966 using commercial receivers and Yagis. He checked also Judica-Cordiglia brothers' claims, and does not believe either that Torre Bert recorded the sensational messages that they claim (dying cosmonauts, etc), or if they did, they have denied to explain him how they exactly proceeded for an obscure reason that has probably nothing to do with their work. For Sven, "such extraordinary claims require extraordinary evidence to be believed. The two brothers never have produced such extraordinary evidence, details about reception frequencies, log books, etc".

I did my own investigations too. In fact the few frequencies that Judica-Cordiglia brothers provided to inquirers are those publically released by Moscow, and thus nothing convincing.

From the pictures released in the press, and the scare interviews we had of the brothers, it is no any doubt that Judica-Cordiglia brothers emphasized their activities and that their network was poorly performing. As we told previously, this later fact was even confirmed by the Gian Battista himself.

Even today, using a quarter-length vertical and a mid-range receiver, a hardware configuration probably close to the efficiency of their so-called Zeus network, an European amateur will experience much difficulties to reach another station located in Angola, Argentina or Tahiti where Judica-Cordiglia brothers claimed have contacts in the years 65's. If they worked with such gears, the results were probably not very convincing, mainly in phone, excepting if they worked in CW or RTTY mode, more suited to pass through QRM and the other difficulties like QSB (fading).

But in 1965-1966 when the Zeus network was active, the Sun activity was quiet ! The Sun reached its minimum activity, with a Wolf number less than 30 as confirms this graph extracted from the World Data Center for Sunspot Index in Belgium. The propagation conditions to the South hemisphere was thus poor at daytime, and at night, the MUF must not be higher than 7 MHz or even less, closing all upper bands to DX.

In the 65's, nowhere on the roof of Judica-Cordiglia brothers' House in Turino there were the appropriate cumbersome HF antennas to contact these stations by shortwaves. No vintage picture taken during that period shows a Marconi vertical, a ground plane, a dipole or a beam antenna cut for HF frequencies to work these remote stations. Nowhere in their tracking station there was a mike or a key connected to an HF transmitter, there was only telemetry and other receivers.

It is surely not in using their VHF dipoles arrays that our two brothers worked these DX stations sometimes located 15000 km away. There were large antennas on the roof of their Turino house, but in the 90's only, as we can see on the picture displayed at left. We see several VHF antennas and what looks to be a ground plane vertical cut at 1/4 or so but of short size, not efficient for DXing. The two brothers never confirm either that they were licensed radio amateurs; they have never provided any license to anybody. Strange organization for a so-called international network.

The Zeus network probably existed well, I don't know if it was really efficient, but it worked only one year and probably outside the amateur bands and without permission or only for listening purposes. It was managed by Gian's fiancée Laura, today became his wife. If they infringed the law in emitting without license that could explain its sudden stop, all the more that it seems that the two brothers were still students at that time and could not ruin their studies. In the best case they were only listeners of HF and VHF bands like many SWLs.

The rumor

It is very easy to build a fake story or to make information retention, and let the time play in your favor in releasing from time to time a bit of information or peace-meal documents, or to pretend that the Italian intelligence confiscated all pictures, even if this is partly true. It is also very easy to get the support of friends and reporters who share ideas similar to yours about the so-called conspiracy and disinformation maintained by authorities.

Such cases count by thousands, specially in the field of ufology and paleontology, and the web, out of any control, is the perfect place to create a rumor and amplify such phenomena up to a world scale through dedicated websites. To complexify a bit more this problematic, as I introduced, in April 1965 J.D. Radcliff published the Torre Bert story in the "Reader's Digest". The text was addressed to a general audience and mainly to youngs. It was translated some months later in French and many other languages, and reprinted in their annual album. This is at this occasion that I discovered this story that partly encouraged me to become amateur radio. "Fate" magazine and the "Washington Post" published also those alleged claims. If these publications influenced me at that time, these three famous magazines are probably not without have produced a big impact on many readers too, amplifying what is today considered as a rumor, because never confirmed.

To be continued



Sven Grahm did a study of Torre Bert claims and does not share at all their enthusiasm.

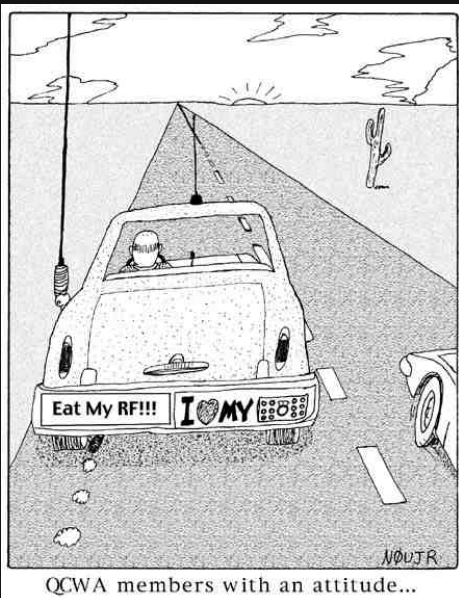
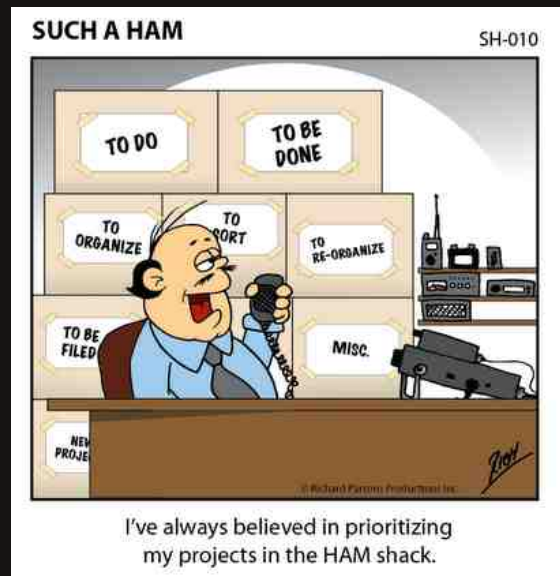


COMIC'S HAM

Have some fun...



Hams 'n cartoons



HAM-MAG N.15 - APRIL 2010

Chief Editor : Vincent Faucheur **F 5 S L D**

Design & conception : V.N.A.C.E.

This issue does exist thanks to : KA5DON, N9ARI, SM3CVM, OPDX, OZ6OM, UU1CC, VK2GOM, VK2ZAY, , Astrosurf, Dan, Joseph Carr.

Send your informations to : f5sld@free.fr
Website : <http://www.ham-mag.com>

This magazine has been sent to 190 members