

THE BACK

PUBLISHER John Fox VA3JRF

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Club Activities

Meetings are held on the Fourth Tuesday of the month at the Georgian Yacht Club at seven-thirty. Come early and get a good seat

Two Metre Net is held each Thursday night at nine. All are welcome. We are always interested in discussion topics. Club Breakfast is nourished the second and last Saturday of the month at Rockford at nine am Eighty Metre Net is held Sunday mornings at nine-thirty on 3.783 MHz.

Just a reminder: it's membership time again.

Message from the Editor

Things are returning to normal in the country as the devastation of Ice Storm 98 subsides. The Amateur community should be proud of the job the clubs in the east did reacting to the severe conditions of the storm. Many lives will have been saved by the work done by these dedicated hobbyists.

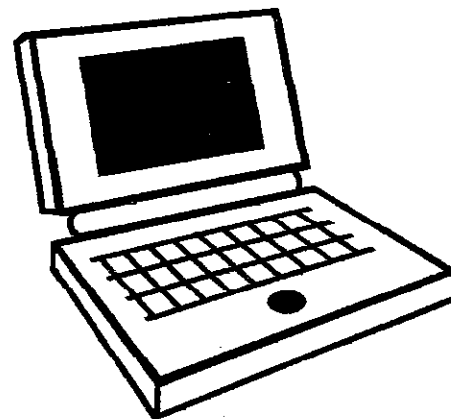
Looking at the job that was done in the east makes an active ARES system a must.

The packet radio system is now back up and running after the storm and other unforeseen situations.

Its been an exciting month!!!

73 John

E-mail addresses for gbarc members



GBARC: gbarc@sbbs.gryn.org

VA3KMS: techie@bmts.com

VE3IJD: mcdonald@bmts.com

VE3RHJ: bj@headwaters.com

VE3XOX: ve3xox@bmts.com

VA3JRF: va3jrf@bmts.com

VA3JJR:

joe.robinson@sympatico.ca

VA3CJM: va3cjm@headwaters.com

VE3BY: ve3by@bmts.com

The official newsletter of the Georgian Bay Amateur Radio Club



Amateur of the year for nineteen ninety seven was presentation to Tom VE3TSA at the Chistmas dinner. John VE3TXB was presented with his keeper trophy for Amateur of the year nineteen ninety six. Thank you to both for your contributions to the club.



The club Christmas dinner had good food and good company.



I don't know about the rest of you, but I ate too much.

SSTV, Fax & WeFax

A "Normal" television picture such as A.T.V. requires about 5MHz of space to transmit. because the largest H.F. (Short Wave) band is only 1.7MHz wide it is impossible to transmit moving pictures, they just won't fit!

It IS possible to transmit still pictures slowly.

It can take from a few seconds to a few minutes to transmit a complete picture depending on the amount of detail and whether it is black and white or colour. Compare this to normal television that transmits 30 pictures every second!

Before computers, it required much sophisticated equipment and ingenuity to use the Slow Scan and Facsimile modes. Now it's very easy. A simple interface between the computer and the radio will do the job. A computer program converts the picture to tones and sends them via the interface to the radio. When receiving, the same program analyses the tones and translates them to colours or shades of gray. One of the most popular of these programs is called JVFax and is available from many of the Links available on the Internet.

These days, SSTV pictures are usually in colour and can be sent on the H.F. bands all over the world using normal S.S.B. radios. SSTV is also used on the V.H.F bands and the U.H.F. bands via radios. Essentially, Radio Facsimile is high resolution (lots of detail) SSTV. Pictures can take up to 15 minutes to transmit but the quality is very good. WeFax is short for Weather Facsimile and is broadcast by a number of government (usually Military) stations throughout the world.

Amateur Radio Slow Scan TV Overview

There are a lot of small things to learn to be knowledgeable about SSTV but Rome wasn't built in a day as they say. You'll learn as you go like any facet of Ham Radio. Being a good listener is always a start. Tune in on the action on 20 metres (14.230 or 14.233) and listen in. There's always other beginners or experimenters, so their questions will often answer yours. There are several modes of slow scan which have been developed. Robot modes 12 second B&W to 72 second colour, Scottie modes 1 to 4, Martin modes 1 to 4, Wrasse modes 1 to 2, ATV modes 90 to 188, Colourfax, and I'm sure more on their way as programmers keep upgrading or designing new systems.

If your interested at all, take the time to build up the simply 741 op-amp circuit described in the JVFAX info. This system works great and is simple to setup and use. The interface circuit is made up of only a 741 op-amp, couple caps, and a couple resistors. The interface circuit plugs into a serial port (com port) of any IBM compatible type computer, 386 or up recommended. One connection from the interface to the speaker output and your copying pictures. See articles for details on connections for transmit and more info on the different systems being used. There's even software available to copy and send SSTV using your sound card.

Introduction

Slow Scan Television has been around for about 3 decades but it never got very much attention. The reason is that commercial equipment was very expensive and it was much too complicated for most people to home-brew. The situation has changed radically in the last couple years. Rather than using expensive special purpose hardware, most of the newer systems are using personal computers to do most of the work. There is

now a wide assortment of free software that uses very simple interfaces and ready-to-use commercial systems at affordable prices. New people are showing up on SSTV everyday.

Although SSTV activity has exploded during the last couple years, it's still hard to find much modern information. The most recent SSTV [hardcopy] handbook published in the U.S.A., that I know of, is now almost 20 years old. Technology has changed quite a bit since then.

A very popular introductory book about Ham Radio (no names mentioned but it's available at Radio Shack) devotes only a few sentences to SSTV and describes it as 8 second black & white pictures. It's been nearly all color pictures for many years.

The CQ 1994 Equipment Buyer's Guide lists only two SSTV products and neither is manufactured anymore.

Some outdated and just plain wrong information keeps getting passed back and forth between various lists of SSTV equipment. A while back I sent letters to 29 different suppliers asking about their SSTV and related products. This handbook contains condensed information from all the replies, magazine ads, newsletters and other sources of information.

How It All Began

by

Copthorne (Cop) Macdonald, VY2CM

I got my ham license in 1951 at age 15, and like many hams of that era, the bug hit hard. I worked my way through the University of Kentucky's engineering school, taking 5 years to go through, working nights and weekends out at the transmitter of a local 5 kW AM station. Naturally, I was hamming on the way to and from work in my oil-guzzling 1948 Chrysler. The rig was a 15 watt surplus WWII AM rig that took up most of the leg room under the dash.

One day in 1957 I was in the engineering school's library, thumbing through the Bell System Technical Journal, when I came across an article on some Bell Labs signature transmission experiments using ordinary phone lines. For the first time I realized that picture transmission didn't necessarily mean extremely wide bandwidth. And being the ardent ham I was, I instantly wondered if some sort of practical SSTV system could be worked out for ham radio.

I spent my spare time during the next few months looking into the feasibility of the idea. What sort of display tubes were available? (Ans.: P7 phosphor.) How did you get frequency response down to DC if ham rig audio response cut off at 300 Hz? (Ans.: Modulate an audio subcarrier.) I kept waiting for the fatal flaw to appear, but I saw none. The idea looked feasible.

I took my paper feasibility study to the head of the EE Department, and asked him if I could design and build such a system as part of an independent problem course. (This would give me a few credits as well as legitimize my use of school facilities for the project.) He agreed, and I ordered surplus CRTs and power transformers and such from surplus houses like Fair Radio Sales in Lima, Ohio. During the next 6 months I designed the unit stage by stage, built a "tank" of a flying spot scanner in the school's machine shop, and put it all together. I still kept waiting for the fatal flaw to appear, but it never did. The system worked!

What is now the Citizen's Band was at that time the 11 meter ham band. All sorts of strange emissions were allowed on 11 meters then, and the first on-air tests were conducted on that band. Since only one set of SSTV equipment existed, audio tape recordings of the SSTV signal were transmitted on the air by one ham station. At the receiving station we listened to this weird sound coming out of the receiver's loudspeaker as we watched the transmitted pictures being painted in light on the screen of the P7 (long-persistence phosphor, radar-type) cathode ray tube.

I wrote a paper describing the system, and entered it in the American Institute of Electrical Engineers (now IEEE) student paper competition in 1958. It won national first prize that year. The ham community first heard about the system in articles that appeared in the August and September 1958 issues of QST magazine.

Shortly thereafter we hams lost the 11 meter band to CB, and had no long-distance HF frequencies on which to use SSTV. I spent the next 10 years working with hams like Don Miller, W9NCP, and Robert Gervenack, W7FEN in specially authorized on-air tests to convince the FCC that slow-scan would cause no problems to regular ham activities and should be permitted in the 75- to 10-meter voice bands as a regular operating activity. In 1968 the FCC finally authorized SSTV operation on a regular basis in the HF bands. In the 1970s my interests shifted to the USES of ham radio -- to "New Directions Radio" -- ham radio for personal growth and social change. Since 1985, I've been spending most of my time writing -- some of it for rent and food money, some on dear-to-my-heart subjects like the development of wisdom, and strategies for living the most effective life possible

Frequently Asked Questions about SSTV

Why send pictures over the radio?

The ancient Chinese proverb, "a picture is worth a thousand words," is just as true today as it was thousands of years ago. Vision is our highest bandwidth sense and the primary source of information about the world around us. Material is easier to understand and more enjoyable when images accompany verbal descriptions. Would you watch television with your eyes closed? Why not make your ham radio contacts more interesting by including pictures?

How much does it cost to get started?

If you already have a voice transceiver and a computer, you can send and receive pictures at zero cost or very close to it. If you're impatient, skip to the last question for details.

How does SSTV differ from ATV?

There are basically two methods used to send pictures over ham radio. Fast Scan TV is very similar to broadcast TV: full motion color images. This requires a few megahertz of bandwidth so it is used only on UHF. A single transmission is wider than the entire 2 meter ham band.

The other method is Slow Scan TV: still images sent through voice transceivers over a period of a few seconds to a couple minutes. Early pictures were low resolution black and white. Now nearly all images are higher resolution color.

You'd expect the term Amateur Television to apply to both Fast Scan and Slow Scan but it generally means only Fast Scan TV.

What kinds of pictures are sent?

Reviewing pictures saved during the last few weeks I found: Hams in their shacks, lots of pet dogs, a frog, kangaroo, astronauts in the Space Shuttle (SSTV has been transmitted from some missions!!!), bridges, birds, Elvis Presley, rock formations, an old fashioned microphone wearing a Santa Claus hat, antique cars, flowers, children, Jupiter, a cow, someone playing bagpipes, a UFO, many colorful butterflies, boats, and cartoon characters with personalized messages. Many SSTV'ers show off their artistic abilities by sending pictures they made with paint programs.

Will future Space Shuttle (SAREX) missions transmit SSTV?

A few years ago there were only several thousand people with the facilities to receive SSTV images. The effort to transmit SSTV from a Space Shuttle benefited very few people. Today, anyone with a VHF scanner, a computer, and a few cheap parts can receive full color SSTV images. Now, millions of people could benefit from these transmissions.

Contact the SAREX committee members with your thoughts on this topic. Tell them how you can help by donating equipment, educating your local club members about SSTV, or setting up a Space Shuttle SSTV demonstration at a school or shopping mall.

How is the image quality?

There is a tradeoff between image quality and time. At one extreme we have low resolution (120 line) black and white images which take only 8 seconds. At the other end we have the new Pasokon TV high resolution "P" modes with 16 million colors at 640 x 480 resolution which take up to 7 minutes. Most images these days are full color 320 x 240 resolution taking almost 2 minutes to transmit.

What frequencies are used?

Some countries are more restrictive, but in the U.S. SSTV can be used anywhere voice is allowed. Traditionally, certain frequencies have been used as meeting frequencies:

•3.845 •3.857 •7.171 •14.230 •14.233 •21.340 •28.680 •145.5 MHz

20 meters is generally your best bet for finding activity. 80 meters is also popular. Recently, most of the growth has been on 2 meters.

What class of ham license is required?

If you are allowed to transmit voice, you are allowed to transmit SSTV on the same frequencies.

Are there any nets?

Saturdays at 15:00 and 18:00 UTC on 14.230 MHz.

Are there SSTV contests?

There are the usual types of contests where participants try to make the maximum number of contacts in a certain amount of time.

There are also contests for the best pictures. The theme is usually the nearest holiday. For example, around Halloween there is a contest for the best images with a Halloween subject matter. There are different categories for natural and computer generated images.

There is also an award for contacting at least 50 different countries with SSTV.

Is SSTV new or has it been around for a while?

Amateur SSTV has been around since 1958.

Why do the magazines and handbooks ignore this fascinating mode?

There were many articles in the early days when most people home-brewed their own equipment. In the 1970's and 1980's most people bought commercial equipment and exchanged pictures. Few people could afford the expensive equipment and there really wasn't much to write about.

In the last couple years, many new low cost SSTV systems have become available and tens of thousands of hams have discovered the fun of SSTV despite the difficulty in finding information. Ham radio magazines in Europe and Japan constantly have articles on SSTV. I have no idea why the American publishers continue to ignore it.

How has equipment changed over the years?

SSTV started out with surplus radar display tubes with very long persistence ("P7") phosphors. This allowed an image to be painted on the screen over a period of a few seconds.

When memory chips became affordable, scan converters became feasible. Scan converters translate one TV standard to another. In this case the scan converter takes video from a TV camera (e.g. camcorder) and translates it for SSTV transmission. In the other direction, it stores an SSTV image in memory and allows it to be displayed on an ordinary TV set.

The latest trend is to use a personal computer, software, and an interface attached to your transceiver. This is much less expensive and much more flexible.

What kinds of commercial equipment are available?

There are basically two types: Dedicated scan converters and PC-based systems. The legendary Robot 1200C scan converter was discontinued in 1992 but other new products such as the SUPERSCAN 2001 and TSC-70 have moved in.

PC-based SSTV systems abound: Pasokon TV, SSTV Explorer, ViewPort VGA, MSCAN, and PC SSTV 5 all have their own hardware interface that connects the computer to a transceiver. Some Multi-mode TNC's can handle SSTV with optional software. You can even use a Sound Blaster with the Slow Scan II software.

What are trade-offs between special purpose scan converters and PC-based systems?

Dedicated scan converters offer some advantages: You plug in the cables, turn on the power, and they work. You don't need a computer. They are expensive.

Most people with scan converters use a computer anyhow, to store images, so why not use a low cost interface and let the computer do most of the work? This is also more flexible, new features are distributed by floppy disk instead of hardware changes. There are two major disadvantages. First, none of the current systems allow you to run SSTV concurrently with other applications. Second, there are occasional conflicts or incompatibilities when adding new hardware and software to a computer system.

Although the single op-amp receive interface is popular due to its extremely low cost, results aren't that good under noisy conditions. Those who have run other systems, such as Viewport VGA or Pasokon TV, side-by-side with the cheap interfaces consistently report that the systems with more filtering and hardware demodulation perform much better with poor signals.

Where do I plug in my TV camera?

The dedicated scan converters all have video input but none of the current PC-based systems do. Capturing an image from a TV camera, such as a camcorder, requires an extra device called a frame grabber. Of course, frame grabbers have many other uses besides SSTV and new models are continually being introduced by many manufacturers.

The bad news is that frame grabbers require a fair amount of high speed specialized circuitry and memory. The good news is that prices are tumbling due to new technology and increased competition. A few years ago you had to pay \$600 for a decent framegrabber. Now less than \$200.

What should I look out for when buying new or used equipment?

There are many transmission modes in use. Make sure the system can receive all the popular ones. If you were to pick up an old Robot 400 (black & white only) system at a flea market, you'd be very disappointed to find out no one sends B&W pictures any more. There is a wide variety in features, ease of use, documentation, price, and so on. Get on the air. Talk to people. Ask what they are using and how they like it.

What plans are available for home-brewing?

Magazine articles in the last couple years:

- 73 Amateur Radio Today -- August 1992 •QST -- January 1993 •QST -- January 1994
- Radio Fun -- February 1995

Is SSTV software available for the Macintosh?

The MFJ Mac Multicomm software for the MFJ 1278 includes SSTV.

Are there any handbooks or newsletters dedicated to SSTV?

- There are only two modern SSTV handbooks:

Slow Scan Television Explained

by Mike Wooding G6IQM

(1992 -- ISBN 0-9513779-3-0)

SSTV HANDBOOK

The primary author is JA6OAC but the rest is hard to decipher because it is in Japanese.)
(1994 -- ISBN 4-7898-1011-9 C3055 P4500E)

- The International Visual Communications Association (IVCA) has a newsletter in addition to its nets, contests, Dayton booth and other activities:

IVCA

P.O. Box 140336

Nashville, TN 37214

How can I get started with little or no investment?

Either dip into your junk box or take a few dollars to your local Radio Shack store, and build the circuit in figure 1. This circuit simply takes the received audio, amplifies the signal, and sticks it into a status line of a serial port. Software measures the time between the zero crossings to determine the frequency. The software converts these tones into images on the screen.

Where can I get more information on this fascinating mode?

- For a more detailed information package, send a large self-addressed stamped envelope with postage for 3 ounces (that's currently 32 + 23 + 23 = 78 cents in the U.S.) to:

John Langner WB2OSZ
115 Stedman St. #A
Chelmsford, MA 01824-1823

RAC Late Breaking News

(These two letters were found at the RAC website)

Radio Amateurs playing key roles in emergency communications in

Montreal and Ottawa Ice storm

Mon, 12 Jan 1998 20:43:23

Here in Cumberland just east of Ottawa, through the Cumberland Emergency Radio Group, communications support was set up early and has been running around the clock. This has been the centre of all Amateur Radio and even official civil and military emergency comms in the Capital Region. The Red Cross, Cumberland Mayor Brian Coburn, Cumberland Fire Chief Gordon Mills, Regional Police, Hydro and even high-ranking military COs, are absolutely raving about the role hams have played. There is absolutely no way that many emergency and support activities could have taken place without the Amateur Radio infrastructure of repeaters, trained operators, many volunteers, their equipment, and associated HF links and nets etc.

The Amateur Radio comms room became the hub of activity with fire, police, hydro and military officials constantly running in with messages that needed to be relayed to the growing official and volunteer infrastructure on the ground. We were even controlling and dispatching military patrol, pump, fuel and generator units...repeaters were absolutely necessary...HF or direct VHF/UHF would not have cut it. I was out Saturday night on patrol in Clarence Township east of Rockland with a number of other volunteer Amateurs. We were part of the military briefing and army staff were assigned to our vehicles for door-to-door search and safety checks...all comms going through Amateur repeaters and back to the military.

We had media crawling all over us all weekend and today - print reporters plus local CBC TV and CTV and French CBC TV. There has been quite good exposure of the Amateur Radio involvement in the Capital Region but I'm not sure how much of it, if any, was fed to the networks. Pat Doherty says Daniel has been on the front lines in Montreal so hopefully there will be some media exposure there also...

The message in all this...if Industry Canada feels less committed to the Amateur Service and our spectrum, here is a golden, made-for-the-purpose example of how hams spring into action and provide immediate comms....we don't just talk about how great we are in emergencies. We actually do it...it works..and soon everyone is coming to us

because we have working comms and are able to fan out, deploy, and set up on short notice in hard-pressed areas. I know personally that hundreds of people in this immediate area alone would have been freezing in the dark with flooded basements and perhaps dead from carbon monoxide poisoning if it had not been for the very real, direct, immediate, effective and practical contribution of Amateur Radio. We should now have so much support that no one will dare mess with Amateur Radio or the spectrum. We should be able to come out of this shining, golden and untouchable so that any minion or public servant who wants to monkey with or neglect the Amateur Service would have a lot of explaining to do and fear for his job.

73, Rob

Robin Ludlow, VE3YE, Editor, The Canadian Amateur;

From: dlamour@total.net

Tue, 13 Jan 1998 14:46:11

I am writing this from the storm crisis center in the offices of the Securite Civile in Montreal where I am since last Thursday afternoon. We are managing up to 15 simultaneous nets depending on the time of day. Our nets are set up in a pyramid fashion and it is working super well. The room next to ours is the media room where all the press conferences originate.

Needless to say, we are shoulder to shoulder with the world media. In order to be able to be effective, we are hiding from these people. The scope of this emergency is beyond the meaning of the word catastrophic. Personally, we lost our power last Thursday and it just came back late last night. Remember, we live downtown Montreal. Imagine the people living in the country. They are speaking of weeks before they get their power back. We expect to have to man this station for another one or two weeks at least.

At this moment, it is raining in Montreal with freezing rain in the outskirts... I'll get back to you when I have a minute.

73,

Daniel, VE2ZDL

Daniel Lamoureux, President RAQI and RAC Director for the Quebec Region