Spread Spectrum Scene

Build Something for Spread Spectrum

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"Build Something SS!"

Editor's Note: This article by Randy Roberts was originally printed in SSS Online's "What's New" magazine of August 6, 1997.

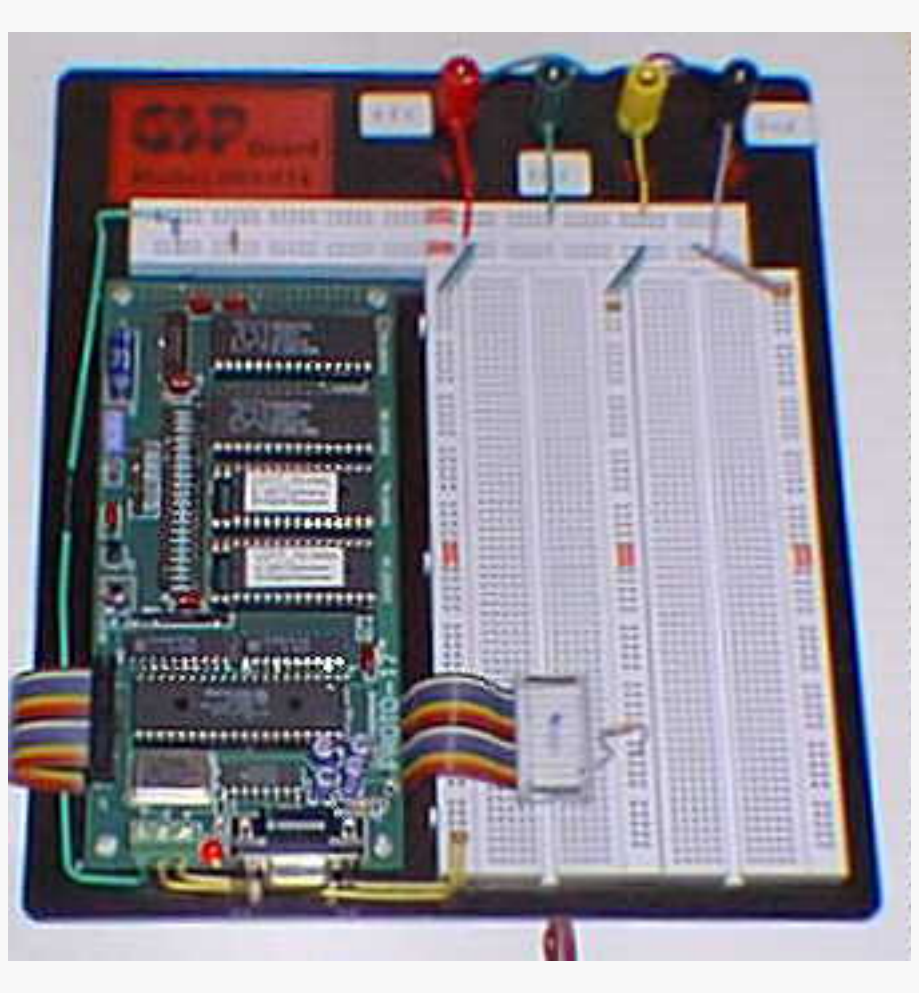
We have wanted to encourage experimentation with SS techniques for a long time. When *Spread Sprectrum Scene* was a paper publication, we published a number of "how to" articles, two generations of "Ham Hopper" transceiver designs and a number of other tidbits for the avid or budding experimenter. We even went so far as to help start a local group of Hams who wanted to build a Ham Radio Wireless Internet Transceiver. This group project never really got off the ground. From time to time we get email and FAXs from individuals, students and Ham groups asking for advice, help or "pointers" on how to get started learning something about SS technology AND building something useful for SS. This short article is the first in a series from SSS Online which will try to suggest avenues of experimentation, SS resources, design tools and we hope to give enough detailed project information so that you may actually duplicate something worthwile for SS.

Now that TAPR has a brand new SS STA from the FCC, perhaps something will finally happen in this area (*Editor's note, March 2006: this STA was in place from 1996 to 1997. For historical info on this effort, see the TAPR STA page*). My guess is that before 1997 is over TAPR will be offering some sort of SS radio / modem kit. I would sure like to help with the design and development of such a project. This may be just what is needed to really get the interest going in SS techniques. I don't know of any kit now available anywhere that can wet the appetite of experimenters, students and Hams, do you? So until TAPR puts out their SS kit, what can people do to learn more about SS technology?

We at RF/SS have had good intentions for a long time and have hoped that we could offer kits, evaluation boards or some other "you build it" version of some of our SS designs. Until now, however we have just been too busy with our commercial work AND we have not seen enough interest in this sort of thing to justify the time, trouble and expense of a new PCB layout, new firmware design and pulling together all the loose ends needed to market a kit to fill this need. Maybe the time is now right -- just maybe, there will be enough interest to get something going.

I assume that most of you would-be experimenters out there have already studied SS theory, have done some Spice, or block diagram simulation or other preparations and hopefully know what you'd like to build. If you are not sure what you would like to build or are not sure what can be built simply, we will provide a short shopping list below (based on some past RF/SS projects):

Many thanks to Mr. Bruce Buell, BB Associates, Inc. of San Jose for the wonderful support he provided on these projects. Bruce did the digital, microprocessor and circuit board designs for all three of these projects. He also helped immensely with Orcad Schematic capture, system integration and test / debug of all of these projects.



PIC17C42 All Firmware PN Generator - De-Speader (Use for TX or RX) -- Will generate arbitrary PN Patterns up to over 2 MHz!

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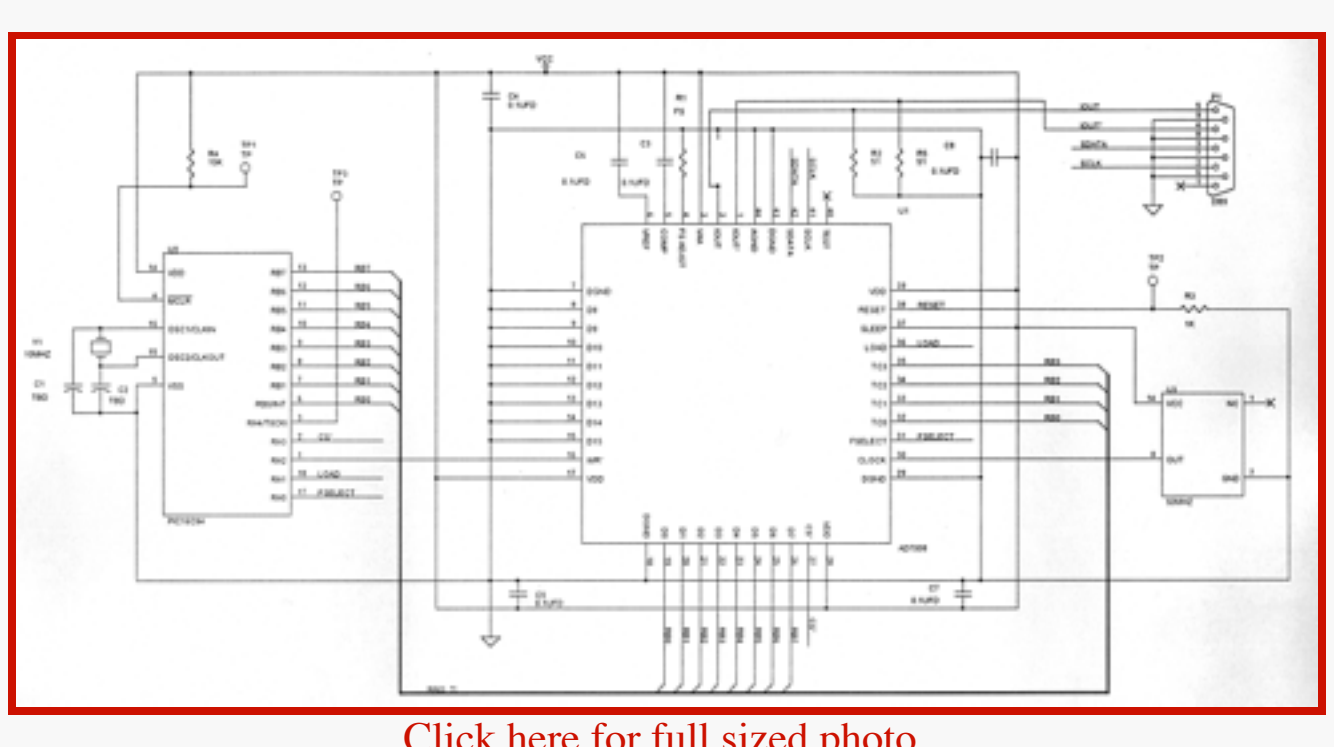
PIC16C84 - AD7008 DDS for Fast Frequency Hop LO (Use for TX or RX) -- Uses 50 MHz clock -- Outputs sine waves to 16 MHz -- will jump frequencies up to 100,000 hops per second!



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HOP2 Schematic

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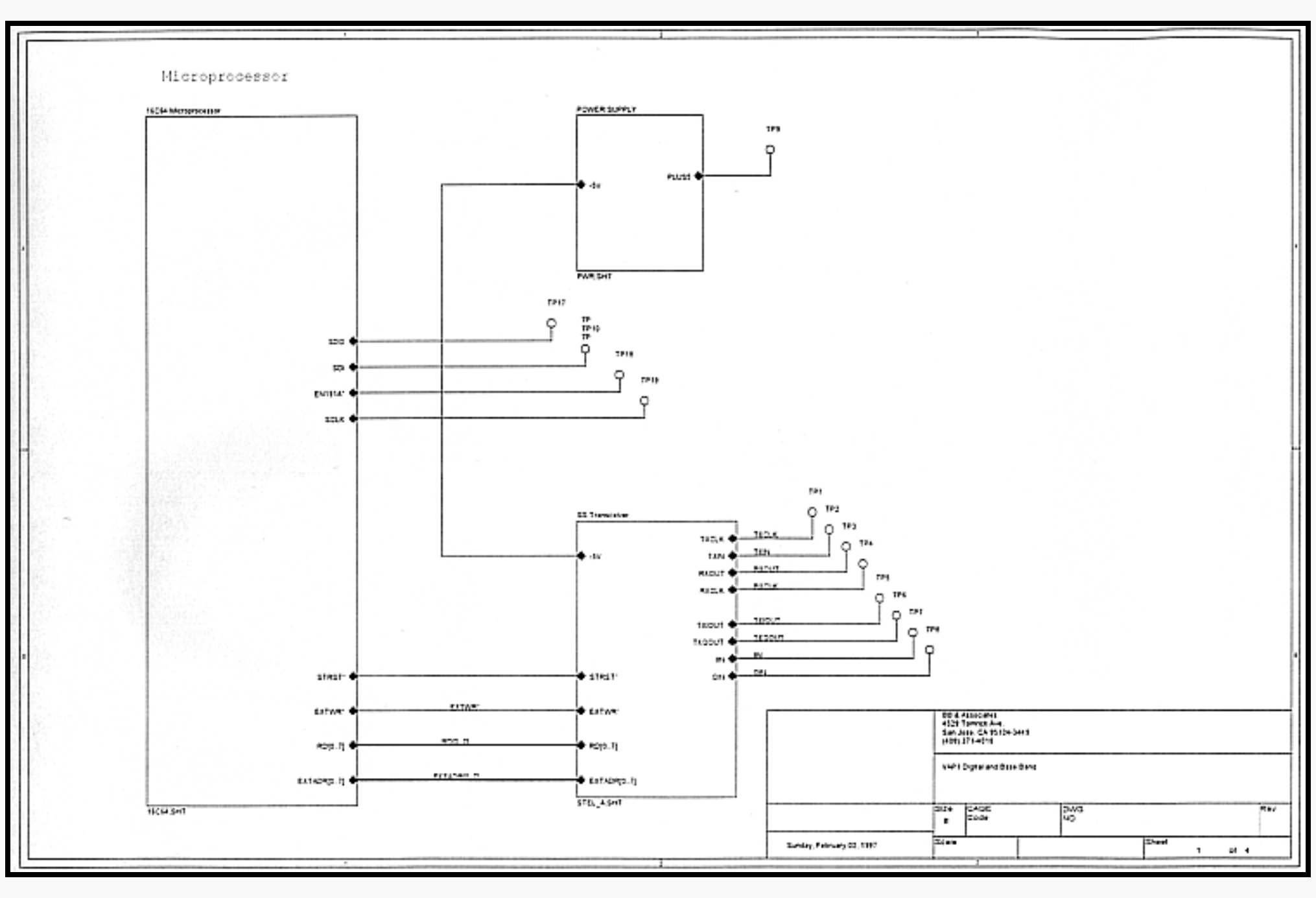
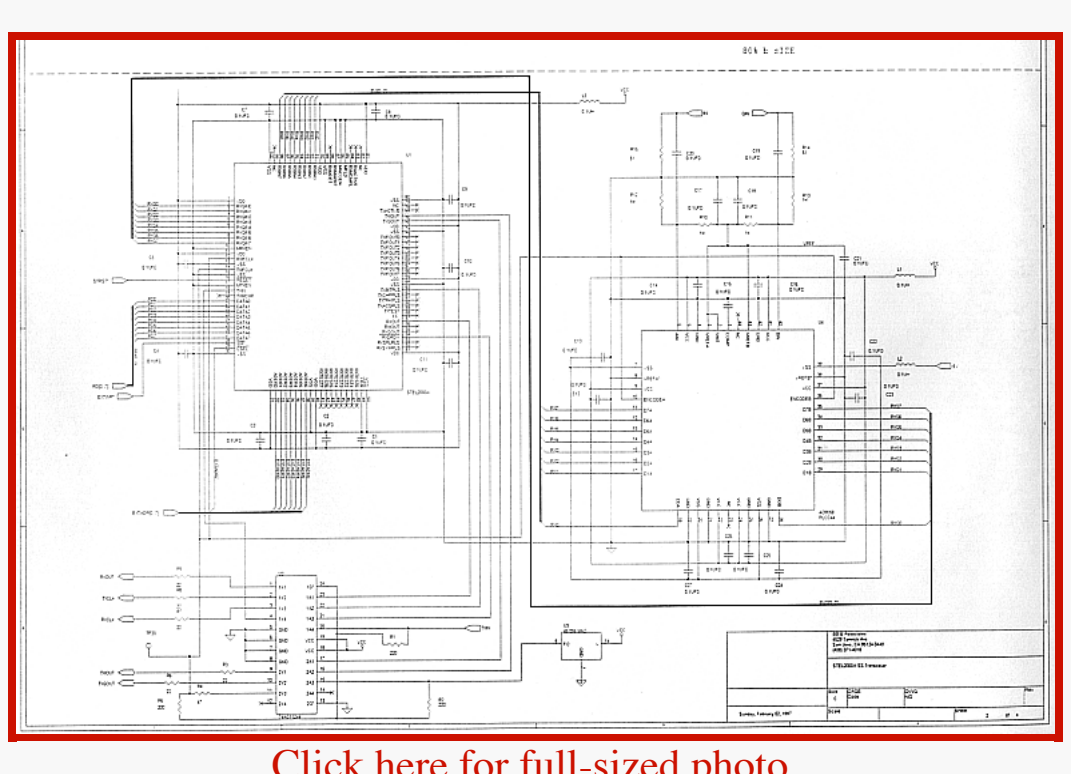
PIC16C64 - STEL 2000A Baseband "Modem" (Use for TX AND RX) -- Maximum 45 MHz clock -- BPSK / QPSK Baseband Correlator / Modulator / De-modulator -- just add IF & RF!

Click here for details on the STEL-2000A in a Modem Design



"Vapor1" STEL based Modem Top Level Schematic



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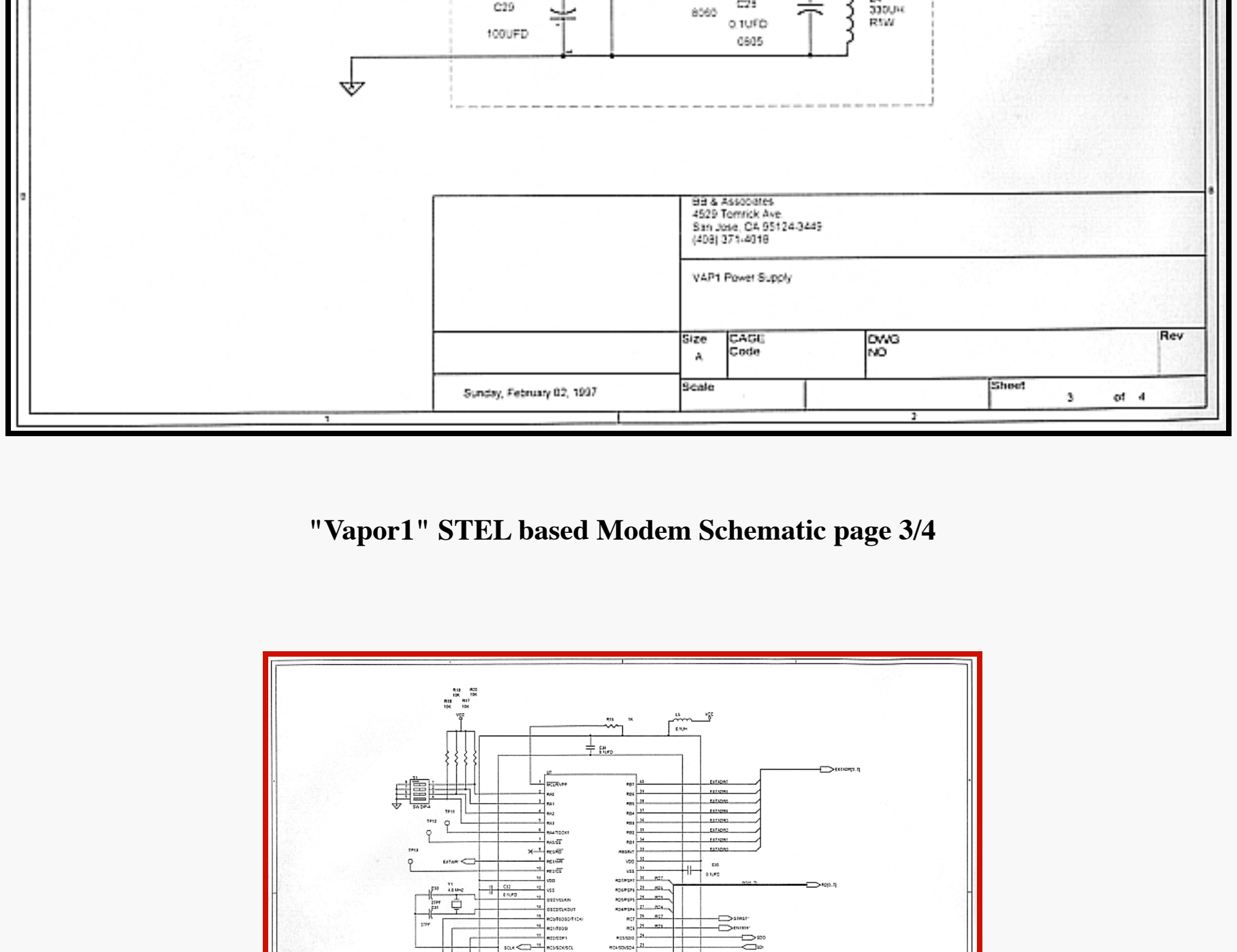
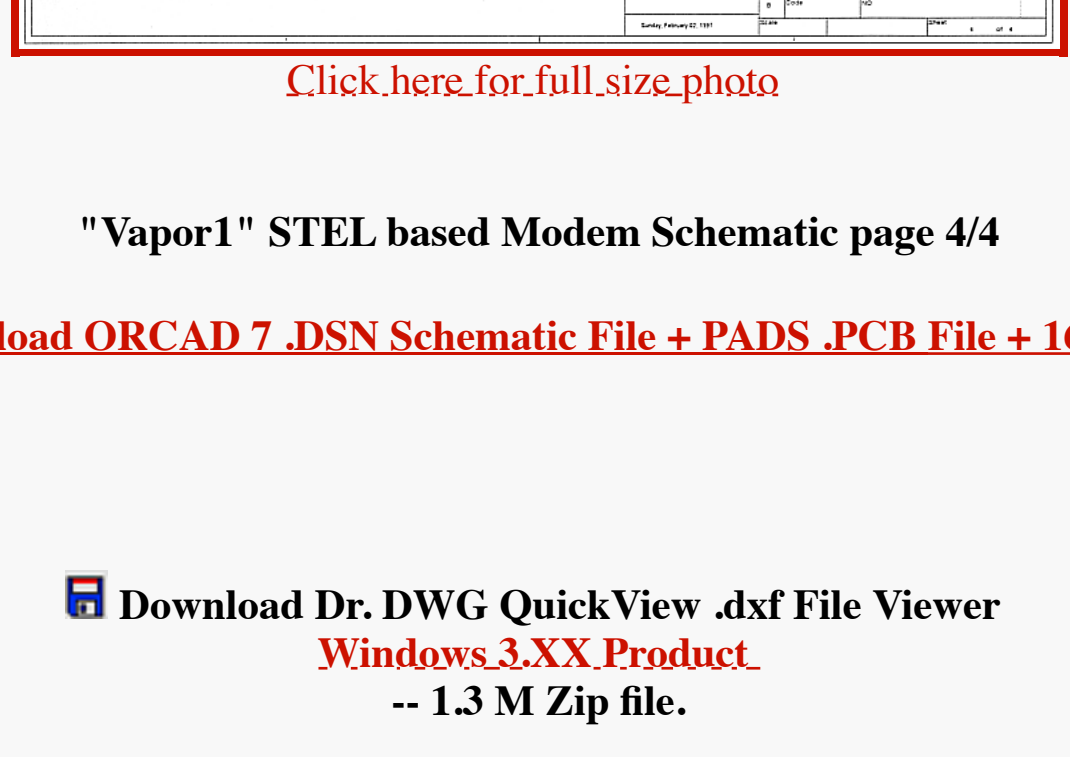
"Vapor1" STEL based Modem Schematic page 2/4



"Vapor1" STEL based Modem Schematic page 3/4



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"Vapor1" STEL based Modem Schematic page 4/4

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Click here to Download All Four Vapor1 Schematics in .DXF Format File (~31 K)

Vapor1 PCBs may be available for purchase -- for information send email to Bruce Buell: **[bbuell@practical-designs.com]**

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