

September, 1985

# PAARA

## GRAPHS

### Featuring:

The second in a  
discussing the  
of switching  
Plus an article  
KB6BPM and



series of articles  
various qualites  
power supplies.  
by new co-editor  
many others!!

**THE OFFICIAL NEWSLETTER  
OF THE PALO ALTO AMATEUR  
RADIO ASSOCIATION  
AND**

**THE MENLO PARK C.D. AMATEUR RADIO CLUB**

PAARAGraphs is the official newsletter of  
the Palo Alto Amateur Radio Association &  
the Menlo Park Civil Defense Radio Club

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Club Net 147.45 MHz, Monday at 8:30 p.m. local time

### PAARA Policies

Membership in PAARA is 6 dollars per calendar year (payable in January) which includes a subscription to PAARAGraphs. Make payment to PAARA,

*Speaker will be*

**Bud -- WB6MVE**  
**Cellular Telephones**

Editor's note - Andy (VE3FZK) has announced the development of a computer program for the "CoCO" computer that will display received packets, WITHOUT using any special hardware ! Most of the code for this program is in a computer language called "Forth". Credit for this development is given to N6LQV (Peter). This early version is not complete, but already displays some images as an 'oscilloscope display', and lets you know if the checksum matched.

Along these same lines: There is a "Digital Communications Net" on 145.230 on Wed nites, @ 7:30 PM, and don't forget the PPRS (Pacific Packet Radio Society) meetings held on the First Tuesday of each month, at the Ampex cafeteria (Redwood city / Bay Raod) at 7:00 PM.

## President's Letter

The Foothill Flea Market was a success, even with the relocation to the lower parking lot near the college entrance. The weather was pleasant, with the morning clouds keeping the day from becoming too hot later on.

I would like to especially thank those that helped out at the flea market. Without the help of these dedicated folks who helped with the many things, this event could not have been the success that it was.

Out summer meetings have had low attendance, but I am hoping to see more of you at the next meeting. I am told that our speaker will talk about cellular mobile telephones, so it should be an interesting talk.

Our editor reminds me that we can always use more articles for Paaragraphs, so lets all warm up those typewriters

de WA6AZP

Editors note - PaaraGraphs needs several volunteers to help in getting this newsletter out ! I believe that a newsletter is an important part of any club. If you can spare a few hours a month to help make it a good one, then now is the time to step forward !



## **INSIDE THE SWITCHER**

The second in a series by WA6LNV

For the purpose of regulating voltage, the switcher is a more "modern" version of the linear regulator. Let's briefly look at this latter device and see what its strengths and shortcomings are. The linear regulator's most obvious characteristic is that it "uses up" the excess voltage between the input and the output.

Suppose that we have a rectified voltage of 160 VDC nominal, but this voltage varies between 120 and 200 volts due to unwanted power line variations, surges, etc... Suppose further that we have an application requiring a regulated 100 volts at 1 amp. If we have a linear regulator (see fig 1), the excess voltage is dropped across the pass element Q1. It can be seen that when the input voltage is say 200 volts, Q1 dissipates 100 watts, or an amount equal to the useful load power! Since the source is supplying 200 watts and only 100 watts are used at the load, we have a regulator efficiency of 50%. Not only is this wasteful of energy (expensive), but is complicated the thermal management of the design. Special heat sinks for the regulator will now be needed as well as cooling fans and other unnecessary complications. The advantages of linear regulators are: 1) simplicity, 2) inexpensive to build resulting in low selling cost, high performance with regard to smoothing out input and output variations.

continued on next page --->

Switching regulators on the other hand are desired for their high efficiency (70 to 90%) and, in aerospace applications, for their miniaturization. Let's see how some of these advantages are realized. As contrasted to the lossy linear regulator, the switcher works on the principle of energy exchange. This exchange takes place at typically 20 to 100 thousand cycles per second. Furthermore, the exchange takes place with inductors and capacitors storing energy, and these devices can be made nearly lossless, resulting in very high efficiency. Only two states are required electronically of the switcher, that of accepting an energy impulse from the source, and that of delivering energy to the load. In terms of our earlier description of impedance matching, our 100 volt switcher would accept 100 watts of energy from the 200 volt line at .5 amps (400 ohm impedance) and deliver 100 watts to the load at 1 amp, (100 ohms impedance). A simplified switcher for this application is shown in figure 2. Energy is exchanged using L and C while Q1 is now a switch, determining what proportion of the time it is necessary to "grab" energy from the source to meet the requirements of the output. In this example the switch would be closed half the time, drawing one amp during the closure but averaging .5 amps during a complete cycle. During the other half cycle the current "commutates" through CRI due to the fly back action of the inductor.

Tune in next month for a detailed electronic description of "SWITCHER OPERATION."

de WA6LNV.

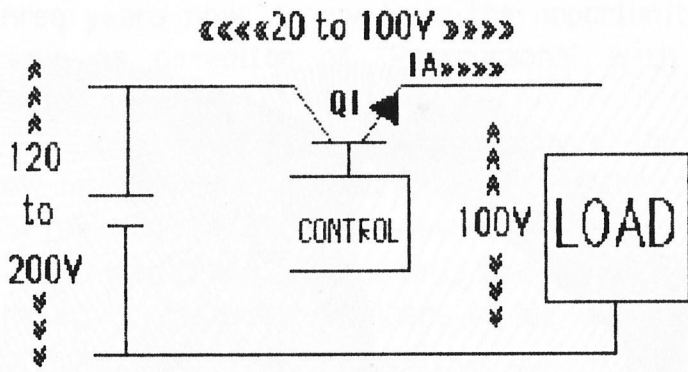


Figure 1  
**LINEAR REGULATOR**

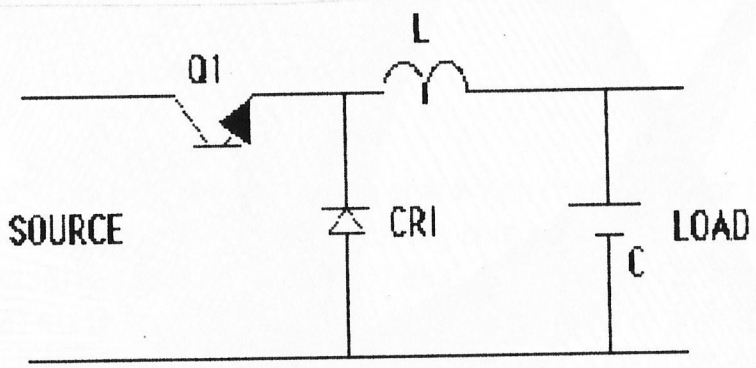
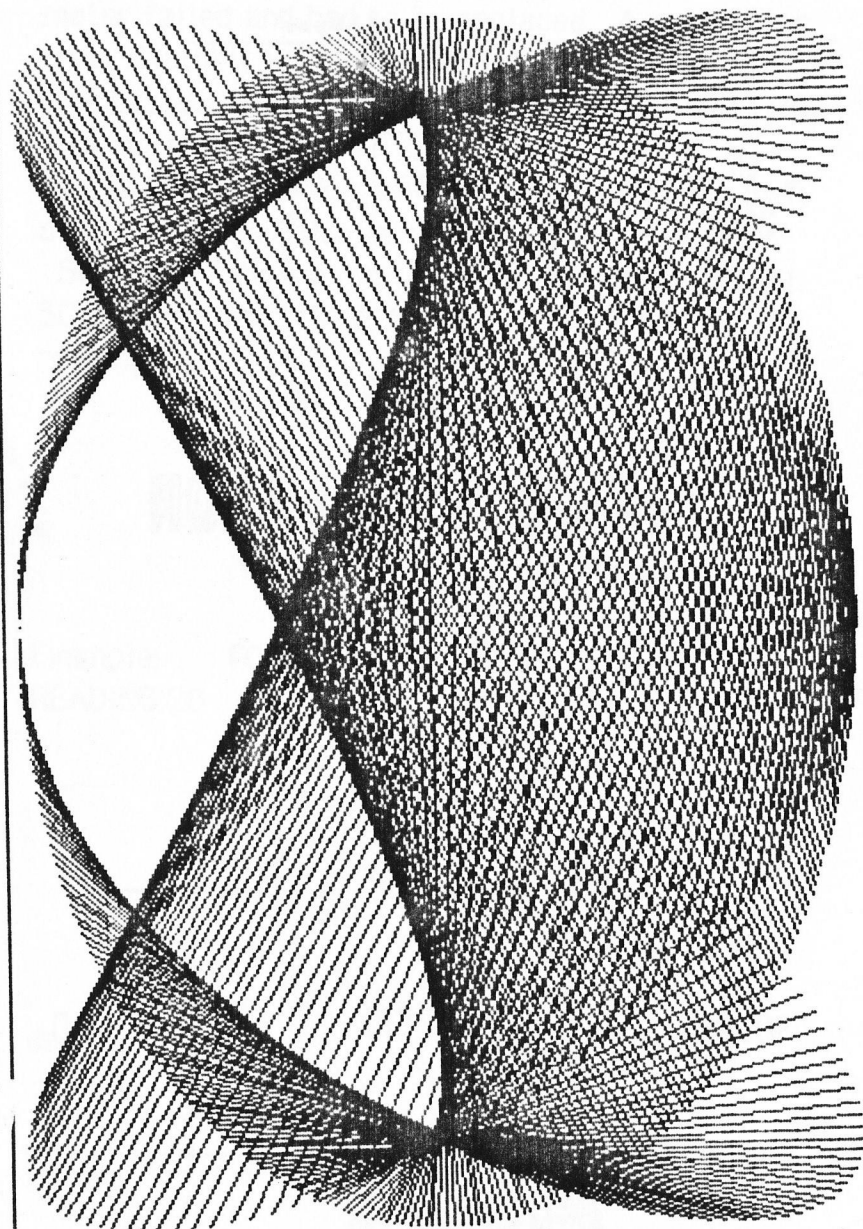


Figure 2  
**SWITCHING REGULATOR**



(Radiation pattern of a *folded* dipole ???)

After being a member of PAARA for about three years now, I now have the opportunity to serve as co-editor of "Paaragraphs" with Rob Taylor, KA6NAN.

If you have seen the Paaragraphs of the past few months, I'm sure you'll agree that they were not giving a very good overview of the club.

I would like to personally thank WA6LNV and the other concerned members of our association for contributing in this edition and in previous ones.

I'm sure we all have some news to share. This is a perfect medium in which to expose your ideas to the entire club. As co-editor, I intend to contribute regularly to Paaragraphs. I hope everyone will help keep the level of quality and quantity in Paaragrahs high.

73's

Kenneth S. Dueker

KB6BPM

Editor's note - I would like to thank Ken (KB6BPM) for his important contributions in editing this newsletter. And, (especially since he did a good deal of the work for this issue) state that Ken is "Co-Editor". If you have any contributions, you may give them to either Ken or myself.

# SWR METER REPAIR

Some time ago the meter in my Heathkit SWR meter failed and had to be replaced. A new meter from Heathkit was considered too expensive. So a low cost 0-100 microammeter was installed with an adapter plate.

Since there no longer was the calibrated SWR scale, a simple calculation became necessary:

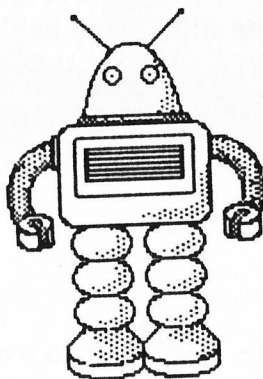
Set the forward meter reading to 100 FULL SCALE; swithc to REVERSE and observe the reading.

$$\text{SWR} = \frac{100 + \text{REVERSE}}{100 - \text{REVERSE}}$$

Example: FORWARD READING 100; REVERSE READING 20

$$\text{SWR} = \frac{100 + 20}{100 - 20} = 1.5$$

de W6AKR





## **REPORTING AN EMERGENCY ON HAM RADIO**

One advantage the amateur radio operator has over the average citizen is that the Ham has the ability to report an accident, or other emergency, while at the scene of the event. Many hams have access to repeater autopatches which allow them to contact authorities while walking around with a handie-talkie or while driving with a mobile radio. This advantage can be an asset or an embarrassment, depending upon how it is handled. Here are a few suggestions, for your consideration, on how to make a successful emergency report.

The Scenario: You are driving North on Highway 101 at the Rengstorff Ave. overpass. You observe two cars collide and come to rest in the middle of Highway 101.

Step #1: Observe the scene for possible injuries while driving past and look around to get the exact location of the accident. If you decide to pull over, make sure you do so in a safe area, so as not to create another accident.

Step #2: Power-up the rig, find your autopatch repeater, announce your emergency, and start dialing.

Step #3: When you reach the emergency dispatcher, say "I'd like to report an accident," and then unkey. Let the dispatcher ask you what they need to know (interview style).



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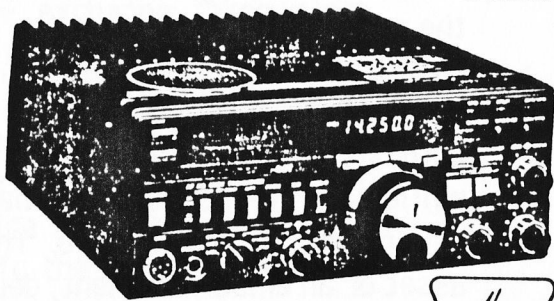
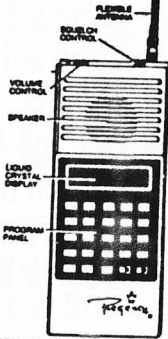
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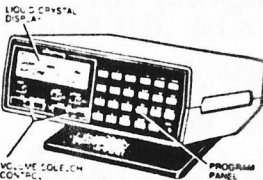


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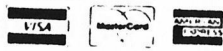
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If you gain nothing else from this short article, but this next point, it will have been worth your time to read it. Here's the point:

When you get the dispatcher on the line don't launch into a ham radio commercial !

Don't start out your conversation with the dispatcher like this, "Hi! This is Ham Radio Operator W6XXX, whiskey-six-xray-xray-xray, on the SPECS emergency repeater, 145.270, and I'd like to report..." This happens!

The dispatcher doesn't know about, and quite honestly doesn't care about ham radio. He/she only wants to know what you are reporting. If you just had an accident wouldn't you want help solicited fast and efficiently ?

Step #4: The dispatcher will most likely ask you for a call-back number. Tell him/her that you are on a MOBILE TELEPHONE and that there is no way to call you. Give them your home or work number. Trying to explain what an autopatch is, and how it works , is not necessary and just takes up the dispatcher's time.

Step #5: Hang-up the autopatch and keep driving or attempt to render aid (depending on your qualifications and the conditions). If you actually see the accident you might approach the responding authorities and tell them so.

continued on next page ---->

Some other points to consider are:

(1) If you are not sure which emergency agency to call (i.e.: Palo Alto Police .v.s. Mountain View Police), use your best guess. The dispatcher can easily transfer you if it is necessary.

(2) When the dispatcher asks you about injuries, don't guess. If you aren't sure, say so. Dispatchers respond help quicker when there are injuries or IF THEY DON'T KNOW. If you tell them that there are no injuries they will think that it is only a property damage accident and the response will be slower.

(3) Be sure to mention if the vehicles are still in the roadway, and if they are, do they constitute a traffic hazard ?

Here is an example of an emergency report which incorporates the above points:

"W6XXX emergency autopatch."

Beep, beep, beep, click, ring

"Highway patrol emergency."

"I would like to report an accident."

"Where is it sir ?"

"It's on northbound Highway 101 just under the Rengstorff Ave. overpass.

The cars are stopped on the highway and are a traffic hazard."

"Are there any injuries ?"

"I couldn't determine that as I drove by."

"Could I have your name and the number you are calling from ?"

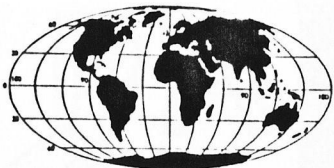
"My name is John Smith and my work number is (414) 555-1212. I'm calling you from a mobile telephone which there is no way to call into."

If you utilize the above procedures you should be able to make a good quality emergency report.

de KA6IRT and N6GWX

(Note - W6XXX and SPECS are mentioned only for illustrative purposes and no poor operating practices are implied !! )

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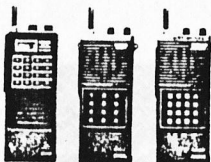


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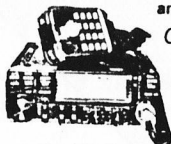
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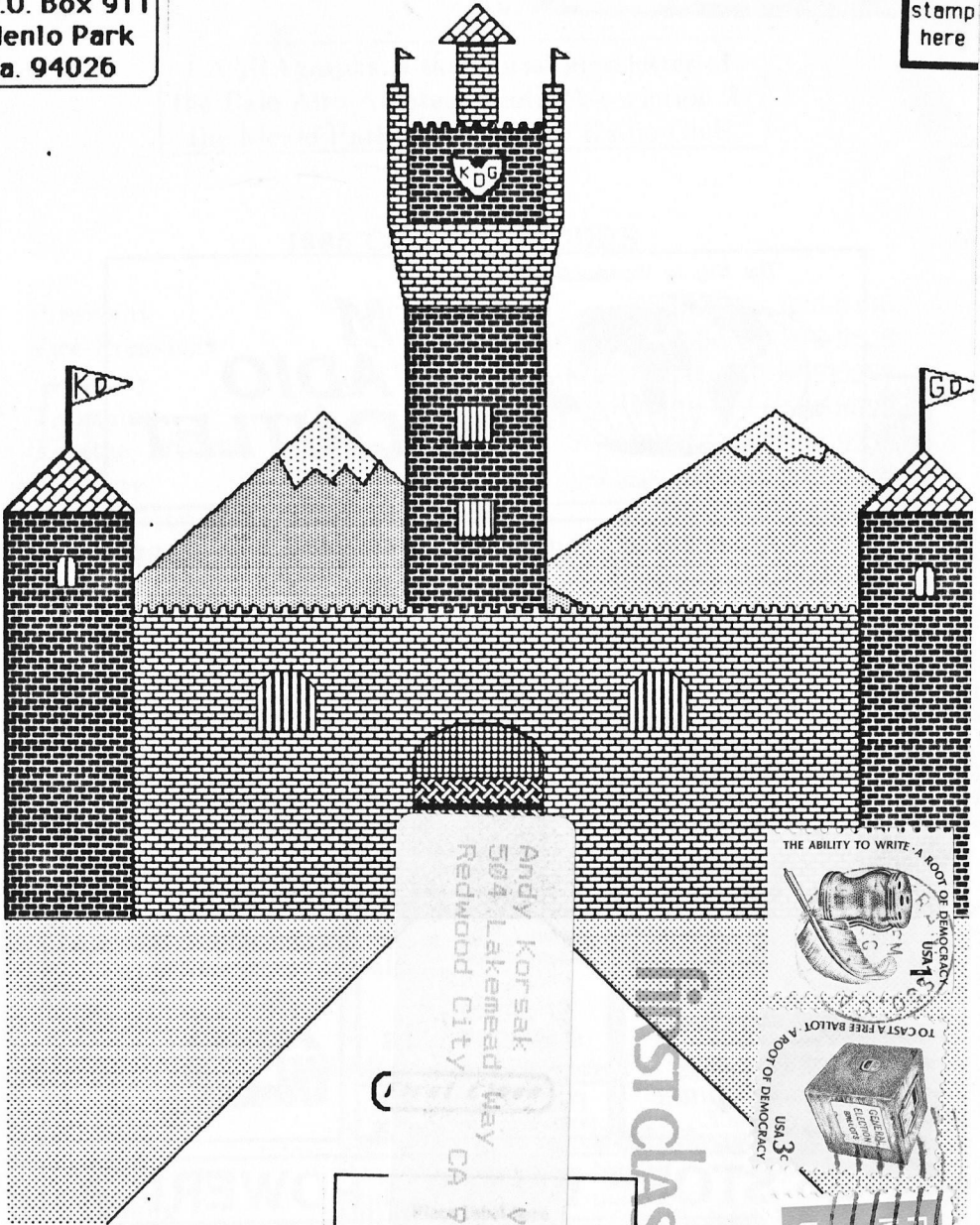
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