

CIRRUS BUILDERS ASSOCIATION

Published by Rick Mills & Dave Doucette

25 Members

Summer 1997



in this Issue

By... Dave Doucette

It seems like just a few days ago we were enjoying the "Spring" issue of the Cirrus Builder's Association Newsletter. In an attempt to catch up this year we are now bringing you the summer 1997 edition. We plan to publish the Fall edition by the end of the year and we should be caught up by late winter. We hope you understand that issues will come out as the articles become available from you the reader-ship. So keep your contributions coming.

Comments on my wing

I promised to write an article for this issue detailing my impression of the new wing. Given the current state of affairs of the attach brackets I decided to withhold some of my comments for now. I am very happy to have my wing in my hanger. Despite all my optimism and all my faith in the stick to it attitude displayed by Cirrus Design, I did, at times, worry that I might never see a new wing. I guess the attach bracket problem also underscores a very important fact.

The fact is that I don't really know my wing very well at all. I never noticed the discrepancy in the attach bracket positioning until Rick Hagberg told me of the problem. So, I will continue to study my wing as I work with it. I hope to have some meaningful comments in a future issue.

New CBA Members

With this issue we welcome two new CBA members. First, we acknowledge Fred Dahler. We don't know a lot about Fred except that he's nearing retirement. Although he has had his kit for awhile he is waiting till he retires to begin in earnest. We welcome Fred to our group. Second, we welcome Ron Sands. Ron joins our group as a prospective buyer in search of a Cirrus kit to purchase and build.

We look forward to hearing more about these new members in future issues of the newsletter.

Doug Taylor

Most of you know Doug Taylor, corporate pilot, who left Cirrus years ago but continues to follow us along in spirit and in these newsletters from time to time. He wants us to know that his new address is 7336 Baybury Road; Downer's Grove, IL 60516. Doug spends lots of time away from home but an E-mail or a Christmas card would probably make his day.

Glenn Elliott

I hinted in the last issue that Glenn should give us some details of his long trip to Alaska. You're in for a treat in this issue as he provides a complete description of his trip "North in a VK-30."

CBA On The Internet

You can now E-mail the CBA Newsletter (Rick Mills) the other newsletter coordinator, on the Internet. The E-mail address is

CBANews@Aol.com

Cy and Jim Mehling

We're always grateful to Cy and Jim for their detailed troubleshooting hints. We will all be there someday and appreciate this valuable reference information. This month we read about a potpourri of problems from wheel bearings to fuel venting. Can anyone help Cy find the source of his fuel leak?

Richard Tems

If you attended the Builders's Conference earlier this year you were treated to an introduction to aircraft wiring from Richard Tems. In this issue he proves once again that there is an art and a science to doing this portion of the building. As usual, compulsive attention to detail is rewarded. Happy reading as we learn more about wire than we ever thought we needed to know.

Epon Mixing Made Easy

I encourage you read all the safety and mixing instructions that came with your Epon Epoxy resin system from Cirrus for the new wing. You're in your hangar fully protected from epoxy vapors and suddenly realize that those dixie cups and syringes won't quite work to get the proper ratio. A quick call to Rick Hagberg reveals that Michael Engineering Limited has the tools you need. I purchased the Ohaus digital lab scale. This "cheaper" alternative works fine but requires you to make up a table of mixing ratios like the one I've enclosed in this newsletter. Rick Mills purchased a "Sticky Stuff" dispenser. A little more expensive but much easier. With this option you don't need the mixing ratio table.



Glenn Elliott

NORTH in a VK-30

August 20, 11:15 am Mountain Time
The Grand Tetons glide past the right wing, bright in the clear Rocky Mountain skies. Laurie and I left Albuquerque nearly three hours ago on our way to visit our daughter, son-in-law, and two grandsons in Cordova, Alaska. I reflect that this will surely be a test of the airplane and how reliable it really is. Some of our intended landings are in very remote places, and we will fly over long stretches of open water and desolate country-side. But, the engine purrs right along and everything with the exception of one scratchy transceiver, seems to be in the green. The scenery so far has been the best that the Rockies have to offer. Across the high mesa continental divide area of New Mexico, to the west of the high San Juan Mountains of Colorado. We're doing a solid 200 nautical mile ground speed at about 55% power.

Then, the GPS indicates that we are 50 miles out of Butte, Montana, our fuel and lunch stop, as I begin to mentally plan ahead for the decent and landing. I won't be able to see the airport until we come around the mountains rimming the town on the south. Unicom for traffic and landing advisories, FSS to close the flight plan (they're too busy to answer), speed brakes out—get this thing slowed down. Gear down and locked, a right turn to final, and we're down and taxiing to the ramp. The plan is a lunch in the airport restaurant (it's

closed—we walk to a nearby motel coffee shop), full tanks, file the international flight plan, contact the Canadian folk on the CANPASS number, and be off to Calgary, Alberta for the night.

August 21, 9:30 am
Calgary departure hands us off to Edmonton Centre as we pass through 8200 for 10,000 in light rain. We awoke this morning to partly cloudy skies and eventually had to do the preflight in a cold drizzle. Canadian rules are very strict about flying in marginal weather; no VFR "on top", no pop up clearances except in an emergency; AND no IFR in an experimental aircraft without prior written approval. I have the approval authorization number that Transport Canada FAXed to me written down in the front of the Canada approach plates. No one ever asked for them in the whole trip; but it's nice to be legal. The controllers all are friendly and seem to take up all the available time chatting about the Cirrus. I'm glad that the STEC autopilot is sort of working.

12:15pm

Fort Nelson shows up just where it should be as I cancel IFR with local FSS in clear skies. We sail in for a good landing as a regional turboprop holds for take off in the opposite direction. As common in Canada and Alaska there's good airline service even for this town of fewer than 2000 souls. It's a great lunch at the airport cafe and then it's airborne again.

4:00 pm Alaska time

Darnit! We just lifted off from Northway, Alaska; and the landing gear UP light and motor are cycling on and off every three seconds or so. We can't have this... Might be pumping all our fluid overboard. I don't bother to open the VFR/IFR combo flight plan to Cordova, less than an hour away;

but stay in the pattern and come back and land.

8:30 pm

We settle down in the airport cafe/bar to eat our cook-it-yourself steak. The gear fluid reservoir was nearly empty! There's no leak that we can find; and I can't really remember the last time I checked by looking into it. It looks red all over from the outside. We bought a bottle of ATIII from a local trucker; and took it up for a test hop and everything seems OK. But it's just too late to go on to CDV. I'm tired and the thoughts of an ILS approach at the end of a long day are not appealing. So a call to daughter Jane, "We'll be there in the morning!", and a room in the local airport motel. When I asked if it was best to stay here at the airport or go into

N60GE parked at Northway Alaska where we were to remain for two days waiting weather to clear.



town, I got the reply, "What town? This is all there is of Northway."

August 22 11:30 am

I'm sitting in the local FSS office, chatting with the lone specialist, and listening to a few of the local pilots fighting the ice and bad visibility. We awoke this morning to rain, low ceilings, and a freezing level of 6000 feet. That's 5000 below the MEA going southwest out of here to the coast. Some guy in a 182 has just asked for an immediate descent and landing here at ORT. There's relief in his voice and in our faces as he reports starting to shed the ice at around 7000.

3:00 pm

The weather which was suppose to improve has just taken a turn for the worse. Visibility is down to a couple of miles and the observer in the little village in the pass we have to cross is reporting light rain and clouds

topping the mountains in all quadrants. That settles it! Another call to Jane; another night in Northway.

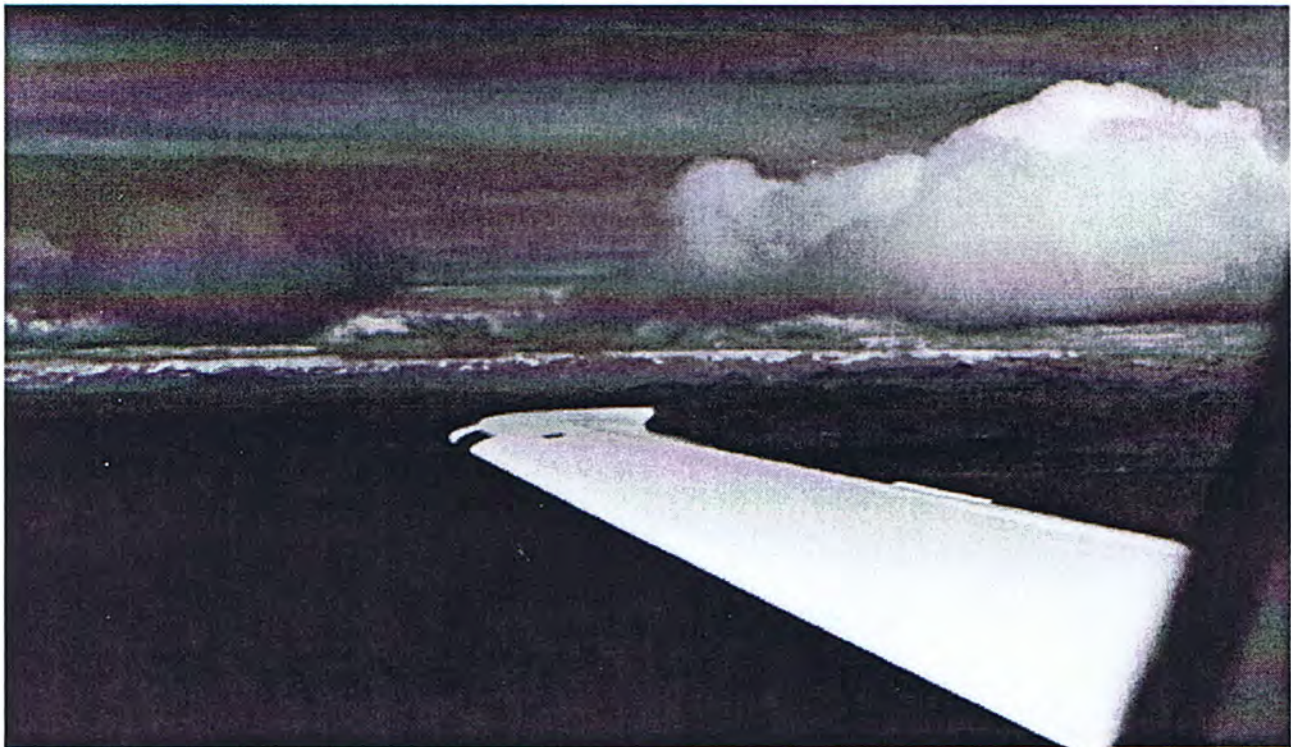
August 23 12:45 pm

We're passing through 7000 and this looks a whole lot better. We had sat on the ground with the engine running for about 10 minutes while I looked at the tiny holes in the overcast. We did a big circle of the airport and climbed up through the largest of the holes, bidding goodbye to Northway.

1:05 pm

I can see the Alaska coastal plain in the distance as we level at 12,000 feet, skimming over the undercast. It's actually VFR all the way to Cordova! I've been pulling climb power from the big turbo Continental since ORT and with a lot of three dimensional jigs and jags we're on-top. Our spirits soar.

Mt. McKinley disappears into the clouds, about 150 mi to our north



1:12 pm

Yes, it's true! That is Mt. McKinley, Denali, reaching up through the cloud layer, about 150 miles away. To our left is Mt. Wrangell, snow-capped at a more modest 14,000 ft. This really is first class travel!

1:20 pm

We cruise along with everything working great. The DME shows 210 as we approach Valdez. I look over toward Anchorage, just across the range at two O'clock, and can't help but remember Roger Carter. Valdez slips by and we make the gentle left turn to CDV.

1:45 pm

We're circling south of the CDV airport. I generously gave up my slot so that an Alaska Airlines 737 can make a straight-in from over the town. It's no sacrifice. This has got to be one of the most beautiful

places on earth. Just east of the airport the huge Child Glacier flows down to the plain out of some of the most spectacular mountains I have ever seen. The Alaska first officer gives me a "clear of the runway" and a thanks as I begin the final approach check list.

Sunday, August 24, 2:10 pm

Son-in-law Mike and I are standing in his boat casting for Salmon. We haven't caught anything for a while but I don't care. The sun has just come out at this little lake located on an island in Prince William Sound. The lake is blue, the sky is blue, and every way I look I can see snow-capped mountains rising almost vertically above the Sound. Four year old grandson has just declared from the bank that he's burning up and I see this little naked boy streaking through the woods. Happy laughter floats out across the water as his

The ramp at Cordova. Although the airport has a 7000 ft runway, regular 737 airline service, and about 20 planes based at the field; there is no fuel available. We filled 5 gal cans at the local float plane base



older brother chases him and daughter and wife join in with shouts. My first flight instructor said, "Airplanes are like magic carpets; They can take you away to Paradise." He was right.

August 27 11:10 am

Well, I don't know if this was such a good idea. I filed IFR on a low frequency airway down the coast. I picked this airway because the MEA was 6000 and that would keep us below the freezing level. I should have looked at the WAC chart. We're 30 miles out over the Pacific! We just passed the Bering Glacier, the largest in Alaska; and there are small chunks of ice floating near shore. Wouldn't last three minutes in that water. Does the engine sound a little strange? Never sounded that way before. Richen the mixture. Turn on the electric fuel pump. "Automatic Rough": You gotta believe it! I key the mic to ask Anchorage for a deviation closer to shore and there's no reply. The remote outlet is over 100 miles away. We'll just go on for another 10 minutes and see what develops.

11:20am

We pass over a the shore line, right on the airway. What was I worried about? Sturdy airplane and engine. I re-lean the mixture and shut off the fuel pump. No difference. Running smooth as silk.

1:30 pm

We step off the ferry into the town of Ketckikan. The airport is on an island. Mike is with us on his way to visit his family in Seattle. He slept through the engine "rough" episode and awoke as we did the ILS. Approaches into airports in fjords are fun! The chart has all sorts of warnings about not flying good. My approach could

have been better; but we're here; on our way to a restaurant.

8:00 pm Pacific Time

Boy, it's getting late and dark and I'm getting a little tired. Fortunately Port Angeles, WA, our destination for tonight, is VFR; but we're solidly in the clouds. Vancouver Center has just given a vector direct to Port Angeles, and that's good. We'll miss all that traffic in the Vancouver area. We've had a number of deviations and altitude changes to stay out of the ice. I know from experience that the VK30 flies just about as well as anything in ice and that's LOUSY! The nice Canadian ATC voice clears us from 11,000 to 5,000. A couple of minutes later she comments about our 220 groundspeed and wants to know what kind of a homebuilt we are. I quickly check that our indicated airspeed is below 200 and wonder if she is as pretty as her voice. Oh well, I'll never know.

8:20 pm

The landing lights pick out the runway identifier as we glide in for another nice landing. (August was my month for making good landings.) We coast up to the tie-down. Even in the dark the N60GE attracts a group of well-wishers. We unload and I stretch contemplating a nice late dinner.

August 29, 12:15 Mountain Time

Home! The wheels touch down at AEG and we roll up to hanger C13. The flaky radio finally gave out yesterday. By the time we got it all sorted out it was VFR and we came home with just one transmitter. Overnight in Boise, ID.

4500 nautical miles in 24 hours flying time. Two relatively minor problems with the airplane. Not bad for something built by

father and son in their spare time.

5. Arriving anywhere in a VK30 is still a blast. Departing is, too. I've gotten a bit rude to folk when I'm doing the preflight inspection. The questions just have to wait. If not, I skip things.

Glenn

Odds and Ends

1. I reported at the builders' conference that N60GE was a lot slower at low altitudes than my normal cruising altitudes of 10,000 and above. I believe now that was due to the rain slowing the laminar wing since we were always flying in the rain during the low altitude portion of our trip to Dayton. More observations indicate that there is little difference in indicated airspeeds with our turbo engine due to altitude.

2. We now have about 280 hours on N60GE. 200 on the new drive train. Everything seems to be doing just fine.

3. We have flown a little more than 40 hours in the last six weeks. It's great to be finally getting some use out of the airplane. Fuel bills are now my biggest airplane expense. A dubious milestone. Maintenance and "finishing" hours still exceed flight hours, however.

4. The plane seems easier and easier for me to fly. I've finally got it trimmed so it doesn't fly in a slip and the autopilot is working in most modes (thanks to Cy's NL articles). I've gotten use to starting the descent and planning the arrival/landing when the GPS says that we are 100 miles out. A tricky approach in instrument conditions still leaves me drained. Maybe that will get better in the next 300 hours.



Cy & Jim Mehling

4 OCT '97

Dear Rick and Dave-

Sure was great to hear from everyone who contributed to our last NL, it was really great. I have been getting calls from all over the USA about our drive system thanks to an article in KITPLANES about our VK-30. That fellow interviewed me and took the pictures way back in 1993, the first flyin we attended on LI, so you can see it is not very current. I haven't seen the article, asked a couple guys to copy it for me. Anyway I referred the drive train calls to Glenn since I am not aware of where he got mine for me.

I need some advice. Recently when I greased the wheel bearings I noticed on the nose wheel that the spacer which meets the bearing race looked like it must have been spinning, it was shiny and chamfered on the bearing end. Could not tighten it up to stop the spacers from rotating and now I have a

slight shimmy. Tightened the nut again, very tight and it still is not tight enough to assure the spacers don't turn. Seems I had this problem on a Glasair once and had to cut the steel tube axle which was preventing the fork from contacting the spacers and closing the gap so as to be able to tighten the spacers against the bearings. Anybody know anything about this condition?

I have just finished my ninth attempt to seal the wing attach fwd fitting to stop the fuel leakage there. Having recently filled the tanks to ck on this leak, I again noticed fuel vapor streaming from the rt wing tip. I know the inbd leak is not sufficient to promote such a stream. I had previously thought it was traveling out the hollow LE from the root. I removed the wing tip, lowered the wing until it was level and filled it absolutely full. There is no longer any fuel leak visible on that tank. Next flt showed it still streaming off the tip. I tried selecting R and L tanks and it seemed to be a heavy stream using the R tank and light or intermittent using the L tank.

I also had a new problem. When jacking up one wing with both tanks full, fuel would stream out of the low wing vent at the tip. Very little off level would cause this leakage. I assume it is coming from the tank vent at the tower quantity since it is higher than the opposite tip where that tank vents. The fuel streaming off the tip seems to be coming from the vent as it exits under the tip and aileron. At this

exits under the tip and aileron. At this point I assume there must be a different pressure vented to that left tank and the pressure is raising the level to the top in the quant. tower and flowing out the vent against ram air pressure. In any event I am considering my fix on the vent system to be a failure and will revert to the original sys that Cirrus installed in the new wing and have to live with the false fuel quan. readings when the tank is over half full and the tower is in use.

The only difference between the two tank vent systems is that I have my pitot tube just ahead and almost lined up with the vent scoop on the R wing. Sorry if I steered anyone wrong on this ongoing problem.

I originally blamed Cirrus for putting the tower vent on the fwd side of the tank instead of the top end as I requested, but I am not so sure that that vent line is filling with fuel from the tower end and never will be any better unless you had a tower as high as the tip would ever get, which might be an impossibility.

6 OCT '97

Test flew the airplane today after restoring the original vent sys and there is no longer any fuel streaming from the R vent scoop which serves the L tank. During the process of disconnecting and reconnecting the vent lines I noted the L tank vent lines were flooded with fuel, very little in the R tank lines. Once again I can fill the tanks without worrying whether fuel will run out of the vent scoops on the ground.

14 OCT

I felt quite confident that I had my wing fwd attach fittings sealed and yesterday I filled the

tanks full again. Well, this morning I went in and looked at the white paper towels I have alongside these fittings to show any stain from leakage and I found both fittings made the towels soak and wet with fuel. Again I have to admit failure and have given up on trying to seal those wing attach fittings. I hope and pray that I am the only the person having this trouble with that new wing.



Richard Tems

Wiring Considerations

Background

After the tremendous reception for my presentation on "Our Friend The Wire" at the CBA meeting in Dayton, Rick Mills asked me to write a paper summarizing the talk. Since that request many months ago, new information has come my way and so this is really a combination summary and presentation of new data. Please feel free to call or e-mail me with any questions or comments you might have.

Types of Wire

Aircraft wire for GA aircraft can be divided into two broad categories:

- RF cable used to connect antennas
- Airframe hook up wire

RF cable-In almost all cases use Mil-M-17 RG-58U. Do not try to save money by buying non-military coaxial cable. Cheap antenna cable can

turn all your radios and comm gear into very expensive ballast.

- Keep wire runs as short as possible.
- Keep RF cable as far away as possible from pulsed power leads, such as strobe leads.
- Use high quality BNC connectors and follow connector manufacturers instructions EXACTLY.
- Do NOT use teeth, razor blades, knives or automotive wire strippers to prepare wires for termination.
- Inspect conductors with a magnifying glass to make sure the conductors aren't nicked after

stripping.

- Put DME and transponder antennas as far apart as possible.

-If using solder type rf connectors, it is critical to remove flux residues with an appropriate remover. Wiping solder joints with a rag is NOT enough. This is CRITICAL. Flux is usually corrosive.

-If using crimp type connectors ALWAYS use the recommended tools and settings NEVER, EVER Pep Boys plier type crimpers!

There have been many articles in our magazines about using buried foil antennas. Antenna choice is, of course, up to the builder. That said, however, I have seen many composite aircraft begin sprouting conventional antennas after a few flights.

Hook up wire

Airframe hook up wire is used for all non radiating requirements, both data and power. It is generally accepted that 20 AWG (American Wire Gauge) is the smallest size which should be used.

As to type of wire, the Military Standard which has been used for years is Mil-22759/16.

This wire was developed specifically for airframe use, it has a tin plated stranded copper conductor insulated with Tefzel (ETFE) rated for 150 c. continuous use. Aircraft Spruce sells 20 AWG for \$.12/ft. This wire weighs about 5.2 lbs/1,000'. Recently I have learned about new wire insulating materials which are now being used in civil and military aircraft. While these new wires types are also rated for 150 C., they do have much tougher insulation. In addition, they are somewhat lighter than the standard M22759/16 wire. The two types we have evaluated for a NASA project are:

- A.E. Petsche private labeled 2012/10 wire
- Raychem Spec 55 wire, aka M22759/34

Both wire types have irradiated ETFE insulation and are much better at resisting cut through and chafing. As to pricing, 2012 sells for about \$ 0.11/ft in 1,000 ft rolls and Spec 55 is \$ 0.15/ft. Both prices are for 20 AWG white wire. We will be using the 2012/10 wire in our Electronic Engine Management Project. Gulfstream just approved this wire for airframe use and if it is good enough for G-5's, it's good enough for us. I have also been told that Boeing will also be approving it shortly. The only bad news about 2012/10 is the color, it seems to be pink in standard put up. Oh Well, I always try to be politically correct.

I have included data sheets on all three types of wire as part of this article.

The point to be made about wire selection is that we are building aircraft which will hopefully live for 30 or 40 years. We need wire which can be installed and basically forgotten about for a half a century. Automotive or boat wire is totally inappropriate. Please use one of the wire types mentioned above.

In addition, remember that wire is weakest at the insulation strip point. Always support the wire behind the strip either with RTV or a rubber grommet such as those supplied as part of

military circular connectors and the new automotive engine connectors. Also, try to always use connectors with gold plated contacts, especially in signal applications, tin corrodes over time which results in higher resistance in the connector.

The points I made in the rf cable section apply equally to hook up wire. FOLLOW ALL TERMINATION INSTRUCTIONS EXACTLY!

Wire sizing

Mr. Robert Nuckolls wrote an excellent article in the June 1997 issue of Sport Aviation on wire sizing. I can't do any better and recommend that you read it. In addition, Mr. Nuckolls has a website.

The address is: www.aeroelectric.com.

Terminal Selection

Please use appropriate ring terminals only. 1/4" Fast-On type terminals are also Fast Off and usually at the worst possible time.

Connector Selection

While automotive wire must never be used in airframe applications, the new types of automotive connectors developed for underhood use are very good. I recommend using the AMP SSC connector family with gold plated terminals. For the traditionalists among you, military circulars will always work, though the cost can be rather high.

Wire Protection

Automobiles and the latest versions of the Cessnas use something called wire loom which is a corrugated slit plastic tubing to protect the cables. I suggest we do the same. Wire loom is very inexpensive. In addition, remember to support the cable runs. Never lay unrestrained cable runs in the bottom of the aircraft.

Wire Labeling

Always label your wire ends. Keep a good wire chart of your aircraft's electrical system. Over the years, when you have to trace a problem, you will be glad you did. I use special heat shrinkable tubing to label wires. When heated, the ink becomes part of the tubing.

It is nice that we are now at the stage of discussing systems installation procedures rather than when, and if we will be getting our wings. If any of you have any questions, please don't hesitate to call or e-mail me. My address is:

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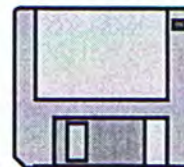
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Gateway G6-200 Pentium Pro
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Adobe PageMaker 6.0
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Submitting Articles:

Hand written or typed articles are fine. If you have a computer available please include a hard copy with your disk. Any IBM compatible word processor program will work. Microsoft Word, WordPerfect, etc.

3 1/2 disc.



Photos!

Please include color or black & white photos with your article. Please let me know if you would like the photos returned.

Please include a photo of yourself with your article.

Newsletter Publication Dates



Fall

Oct. Issue
Mailed Sept.15
Deadline Sept.1



Spring

April. Issue
Mailed Mar.15
Deadline Mar.1



Winter

Jan. Issue
Mailed Dec.15
Deadline Dec.1



Summer

July. Issue
Mailed June.15
Deadline June.1

Deadline dates are for articles submitted on IBM compatible disc. Please add two weeks for typed or hand written articles. Send photos and graphic work as early as possible.