



The Resident Team Training Program by Jonty Skinner (1995)

Jonty Skinner is currently the coach of the Resident National Team that trains and lives at the U.S. Olympic Training Center in Colorado Springs, CO. The team has organized in October of 1994 and is funded by a grant from the U.S. Olympic Committee. Skinner, 40, served as head coach at the University of Alabama from 1990 to 1994, after a two-year stint as a Crimson Tide assistant. He has done extensive work through United States Swimming, serving as the chairman of the Sports Science Committee and also as a member of the Olympic International Operations Committee. He has served as U.S. National Team coach from 1987 to present, with his most recent stint as an assistant coach on the 1993 Pan Pacific Games staff. He has coached Olympic gold medalists Troy Dalbey, Angel Martino and Jon Olsen, and 10 individual USS national champions. In 1994, he was named the Southeastern Conference Coach of the Year. As a competitor, Skinner held the world record in the 100m freestyle from 1976 to 1981 and is still the 10th-fastest person in history in the event. He was inducted into the International Swimming Hall of Fame in 1985.

Before I get into this I just want to cover a couple of things.

One is, I want to reiterate the fact that this concept, this program, the training or technical aspect of this program, is from the mind of this person standing up here. It's certainly not something that's endorsed by United States Swimming, although I work for United States Swimming and work at the head office of United States Swimming. This is a program of Jonty Skinner and not a program that United States Swimming says is what we want everyone to do. It's real important.

I have put together an annual report of the entire year of training. It's a huge thing that originally we thought wouldn't cost a lot of money. But now, after putting the whole thing together, it's a fairly decent size wad of information. There's a copy of it at the US Swimming desk. It turned out that it took \$12 to put it together. So what Denny and I and Steve Roush have decided, and really it's Steve's area right now, we'll make it available to coaches in a couple of different forms. One would be all the workouts plus some information. If you want to go further than that you would be able to buy the whole thing. The rest of it entails all the graphs, personal information, and training data from the athletes during the year.

We have had changes. We've been up as high as thirteen athletes. We're now currently down to eleven. I will explain that some people have retired from the program on their own choice. I have asked one athlete to make a strong decision to go back to sea level simple because I felt that his training at altitude was not conducive to his development as far as his career was concerned. Whether it was his body type, or the stroke that he swam, I felt that Jud Crawford was being inhibited by training at that altitude. I think that he made a very wise decision to go back to sea level to train. Even though this is a pilot program I don't see why we keep people in there just because

we want to find out if it works. I don't think that altitude training is the best for everyone.

I will also note that we do allow athletes to come and train with this group. I have on many occasions had coaches come in and spend time on deck watching what goes on. In that light I would like to say that coaches are always welcome as long as they talk to me in advance and make sure that we are there and what we are doing. I do try to spend time with them when they are there and I think it is really helpful. Sometimes people question what I am doing and it makes me think. We do have athletes train, but this is an area where if you do have an athlete train with this program they do exactly what we do. There is no ability for anyone to deviate from that program, or to do what they want to do in another lane. That doesn't work. We will also have asked that these athletes be at the highest level, especially in the pre-Olympic year. Preferably they should be in the National A-B Team category or higher. Again, that has to be cleared with me in advance. We currently have a kid training with us for three weeks who is in this category.

Also, this is always a hot topic and a controversial type program. People love to jump up and down and get excited about it — both positive and negative. I will ask this morning that we keep this to the very technical side, the coaching side. I don't want to take up time entertaining questions on the political side. If you have anything that you wish to express, either positive or negative, Dennis Pursley and myself are quite willing talk to you after the meeting. We are very, very anxious to find out what you think both positive and negative, because again it is new. In some cases we try to make decisions on the run because there is no set protocol as to exactly how this is going to run. The evolution side of it kind of makes us make decisions that weren't predicted up front. So we're very willing to take your input and go with them.

On to the program side. There are a couple of things I want to say up front before I start throwing a lot of information on the board. First the philosophy that I take as a coach is that I have a credo that says “develop power through endurance.” A lot of the kids in this program, ages twenty-one to twenty-six, all swim events fifty to two hundred meters. (Although we had some athletes swim outside that range this summer.) The majority of them had done a fairly decent amount of yardage during the year, but quite a number of my real sprint sprinters — the fifty/fifty people-had never been over 40,000 in a week of training on a regular basis. Quite a number had never really done that much in doubles so I had to spend a lot of time up front with these athletes educating them on physiology. We spent at least three weeks going through why it was necessary to do endurance training, how it benefited them as athletes, where it was going to make the difference in the long run. I really took my time to sell them on this concept. Now, granted it got a little rough, especially some of the times when we went three a days. Some of the sprinters looked like they wanted to commit suicide before they started the third practice. But, I think it was part due to the fact that I did a good job selling them on endurance and then really taking the time to make sure that on a day to day basis that I put them in training speeds and training environments that were not overly overwhelming or overtaxing.

I spent a huge amount of time making sure that their stroke technique and biomechanics did not fall apart during the training. I just kept a watchful eye out there, because when athletes do things they've never done before, sometimes their mind plays tricks on them. They try to think like, “this is not good for me,” “why am I doing this,” “what the heck am I doing here?” You have to constantly be alert to make sure that you're there to reassure them that it is good. That it is no problem.

In December, we went down to Oklahoma City to swim a short course meet, and quite a few of them swam times comparable to their best unshaved times they'd ever swum in their career. It was really shocking to them since we had done three a days going into the meet. I think we covered almost 55,000 yards/meters before we even got to the meet. They were kind of shaking their heads saying, "I can't believe this is happening." All it did was reinforce the fact that what they were doing was very good for their bodies. It was laying a base foundation that they needed for the future and it certainly wasn't inhibiting their speed.

I use United States Swimming's energy category systems. There is a handbook available through United States Swimming. I hope that everyone in this room has a copy. If you don't, I suggest that you take the time to get it from United States Swimming because everything I put up here, everything in my annual report, is relative to those energy categories. Again, you need to understand in some cases what those categories are and how they relate to the aerobic-anaerobic continuum in order to understand the total concept.

I also think that testing plays a very critical role in the development of athletes. We do a lot of testing. It's not just because I'm at United States Swimming and I have ICAR (which is a tremendous benefit and a support system to the program.) All through my career I have placed a heavy emphasis on testing my athletes. Initially some of the tests were very crude, very Neanderthal in nature, but in my mind, were very important to tell me what was going on with that athlete at that point in time, and then to get some kind of longitudinal look as to what was occurring as the athlete went through either that season or many seasons. I think it is critical. The one's I'll show you today are easily supported by ICAR because they have all the services that anyone would ever want.

But, I still feel that there are many tests that any coach can do. It doesn't matter what your environment is, or what your home pool situation is. Really all you have to do, to do it at home, is try to find a way that you feel confident or comfortable with to test your athletes. Make it the most important thing that you can do during that period. Make sure that when you do your testing, your protocols are exactly the same every time. Make sure that the workouts prior to your testing workouts are exactly the same. The testing week that we do with this program always runs one entire week. On Monday the practice is always exactly the same. The testing sequence is the same. The workouts are the same. It's the best week because I don't have to make up one workout. I just import the last testing week's workouts into my workout manager file and I'm done for the week. It's great. I never complain. There is a lot of work to do with the testing, but that's a lot of fun because it's exciting. It's kind of like toys under the Christmas tree. You're not exactly sure what you're going to open up. You have an idea, but you're not sure until you actually see the results.

This is, for those of you who have never been to Colorado Springs, it is one of the few slides I could find that gives you a good idea of the video set up in the pool. It's a really, really wonderful thing. You can do a lot of things with it. We also have an underwater tracking camera that runs up and down the entire length of the pool. There a lot of different camera set ups from a lot of different angles. There are a lot of decks to do replay. We also have a telestrator that's in there right now to work especially when you are evaluating races or technique underwater. You are able to run the tape through the telestrator and you can draw on the screen. You can show the kids exactly what they're doing. I had a hard time when I first started using video equipment way before I was at the Olympic Training Center. I kept talking over the top of the tape and I'd say-"Listen, you dropped your elbow". One smart-ass kid came back and said, "Okay, I dropped it, where did

it end up-at the bottom of the pool?" They don't know what a dropped elbow should look like, so telestrators are great. They're really not that expensive. They're from Weber Electronics. I'm not getting any money for this. I'm just saying that they cost about \$800-\$1000 and they are really useful, great tools.

Here is a slide from a hiking trip. Before we ever got into the season I took the original twelve kids on a four day hike in the mountains through a lot of ice and snow, which was great. It really put a lot of kids into a lot of adverse conditions. The group that we work with is a group called Peak Performance, out of Colorado. They gave us some rudimentary information about how to put up a tent. These weren't tents. They were just tarps. This was just a sheet that covered your body. The wind could come in the side, any side it wanted to. They said this is how you build your tent.

We hiked in the mountains to about 11,000 feet, in the snow and a lot of snow was on the ground, and built tents. I've been on this kind of stuff before so I knew to find a really flat piece of ground on which to build my tent. I slept and I was pretty comfortable that night, but these guys weren't too clued into that fact so they built their tents on slopes. In the middle of the night with all the wriggling, and folks when it gets dark you just go to bed, which in that case it was about six o'clock at night you know. Kids woke up at eleven and go, "God, is it morning yet?" It's not even morning and so in all the wriggling and squirming, especially in one of these tents, they all ended up with their feet outside of the tent, in the snow, with the snow, and the sleeping bags got wet. Those of you who have ever camped with a wet sleeping bag know isn't a whole lot of fun.

A lot of them came and got breakfast in the morning about six AM. They just looked like, "Please give me some hot chocolate, something to return me to the human race." So we really put them in pretty adverse situations.

We climbed Mt. Massive the first day, which is the second highest peak in Colorado, and had to do it under real adverse conditions. Two days later we went up Mt. Elbert, which is 14,300 or 14,400 feet, which is the highest peak in Colorado. Again, the idea was to make them work together, to share with one another. The group that we work with did a great job of making them interact and I thought it was a wonderful experience. Some of them weren't excited about it at the time, but I know that it will be a special experience for them. But it was the first step to really mold a group of people together.

This is the initial training plan that I set up prior to the start of the season. Very general. Just looking at different phases. The different phases: aerobic development, a little bit of endurance, aerobic development, maximum endurance, which is a VO2 max loading phase. We went through another kind of VO2 max phase here at altitude and then a lot of race development. I'll look at the summer a little closer in the next slide. This basic plan is just looking at where the pulling emphasis, the kicking emphasis (I use fins a lot in training and this is when we use them), weights, dryland, plyometrics, and competitions.

This is looking a little closer at the summer. I wanted to emphasize it a little more. The set up is a little different here.

We just showed you the energy system emphasis. In the spring we did our VO2 max loading phase at sea level in Orlando, Florida for four weeks. In this May area we did a VO2 max loading phase up in Colorado Springs and so we did it the second time at altitude for a four week phase.

Our anaerobic phase, or the sprint phase, came through the June to July period. It started off after the Alamo Meet at the end of May and went through the Santa Clara International in the early part of July. I forgot to mention up front that part of my philosophy is that I'll talk in terms of aerobic and anaerobic. To me aerobic training is everything up to VO2 max. I consider VO2 max training to be improvement of the aerobic system and then everything beyond VO2 max to be anaerobic training, pure anaerobic training. So when I talk one versus the other, that is the way I'm thinking.

If we look at the results of the training you'll notice that we went up to a fairly decent peak up in the December area which is mostly aerobic training. Then in the January period we went up through a little more aerobic training. The first VO2 max sequence came in right here. That was the first time we'd really done any significant training that really taxed the VO2 max system. Then we came back and did some more aerobic development. The next VO2 max sequence went through right here, which was in May, going up prior to the Alamo Meet. We did a little more training, again a little more extending training, and it was a lot easier to do it because we didn't have a meet in the middle of it as we had in the February period.

Our first real emphasis in what I would call the lactate tolerance, or what we know as the SP1 system, occurred in the early part of June. The first real

major emphasis in the SP2, or the high end lactate training came in the late part of June and early July.

Outside of that, if you look at this carefully you'll see that in the way I look at things almost ninety to ninety-five per cent of the training was done in the aerobic system. You'll also note that fifty per cent of the work, 50 percent of over two million meters in forty-four weeks, was done in the category that we call EN1 or Endurance Level 1 system. Those of you not familiar, this is a pulse rate range of approximately 120-140.

I looked the sprinter's group in two levels: A middle distance group of people that are swimming primarily the 100 and 200 events, and a group of people swimming primarily the 50 and 100 events and there's not a lot of difference. Really about 150,000 at the end of the whole thing. Major differences you can see probably occurred in this area down here where the volume wasn't as great and in here the volume wasn't as great again in this zone. Also the weekly volume may have been a couple of thousand less per week — not a lot of change in the basic diet.

This was an example of the main sets for what I would call an EN1, Endurance Level 1, Endurance Level 2 type week. Again you can see that basically the majority of the work all week was pretty much in those two categories.

We did some work that I call SP1, or some tolerance work which included kicking. As an example, eight fifties on an interval of two and a half minutes. We also did some initial VO2 max work which is a pull set here and a kick set here, which for my protocol gives them about sixty to seventy-five seconds rest on the interval.

These are the main sets for week thirty-two in the sequence — biggest week in the May VO2 max load. Mondays, and Fridays stay basically the same. They're always, always, Endurance Level 1 and 2 type workouts. The main changes will come on Tuesdays, Thursdays, and Saturdays. As you notice Wednesdays are always the same — recovery type workouts with the afternoon off. Wednesday practices, once we get into the high volume stage, never go over 4,000 meters. They are always very recovery oriented. I let them go at their own speed.

Every other practice that I ever do, unless I'm away from Colorado Springs and I don't have the facilities, is very dictated. It's all computerized. It's all pre-programmed. In many cases I'll have six different pace clocks going and no more than two to three kids on one clock doing a very specific speed workout.

You'll see here a couple of additional things. For one, an increase during the VO2 max phase. I ask my athletes to do all the VO2 max work at VO2 max. I didn't limit them at the top end, which means that if they could swim faster under those conditions of only getting a minute to minute and a quarter rest, then they could swim faster. What I did was give them a low end and say I do not want you to swim slower than this time. Outside of the VO2 max phase I allow the athletes to descend from their threshold speed to their VO2 max speed. In most cases I use a protocol that says, if the VO2 max set is beyond a thousand meters, I usually split it into two sequences. You can bet that eight two hundreds are split into two sets of four times two hundred with a four minute break in between. I think on the twenty-four fifties we did that in three sets of eight.

Down here I continue to do that additional pulling and kicking set. We also put in some vertical kicking. Again, I work with intensity, usually with weights. The way I calculate yardage is a time, or I go for a specific amount of time and calculate that. I figure that David Fox at VO2 max speed is going to kick a fifty in about thirty-one to thirty-three seconds. So try to get the duration of the exercise to suit that duration. Again this is a pretty heavy week and I believe the VO2 max yardage is about 8400.

This week was the lactate tolerance week. It was about week thirty-six. It was two weeks after the Alamo Cup. We were training at this point in Corpus Christi Texas, which I might add is a wonderful place for us to train. We had a lot of fun. We never encountered more hospitable people in our entire year of training. Again the normal recovery on Wednesday and the normal Monday and Friday EN1/EN2 load. The difference now is that we pulled in an SP1 set in the Thursday mornings. These were again four to one work/rest ratios in that range so they had a lot of rest, but they could not get off the wall. They stayed on the wall between repeats. We also started now to include a set that I think is really critical to racing and race position.

I love to do a lot of work with fins. In this case we're fifties on 1:10. I'm looking for them to get up on top of the water, to put a little overload using paddles and fins to give them the position. In the afternoon we're still doing our kicking and pulling maintenance areas. We're still doing the VO2 type stuff on vertical kicking. The only change comes in the Saturday workout where we are now starting to introduce the SP2 which is the high end lactate work with a lot of rest and recovery in between. For example, five one hundreds on ten minutes. This is stuff I stole from Coach Urbanchek. Now I find out he hardly ever does it.

This is week thirty-nine. It occurred two weeks after the Ultra-Swim Meet, three weeks after the sheet I just put up. Again you'll notice that what I did was run in cycles. I usually run in three week cycles. Many of these work outs are exactly the same as the one three weeks ago. Some of the preparation sets are exactly the same as the preparation sets three weeks ago. Now the difference is all of a sudden we are doing high anaerobic on a lot of rest interval. I think these were on twelve minutes. Again we're still maintaining some EN3 work.

We introduced here what I call neuromuscular work into the training. These are sets of eight twenty-five's on thirty to forty seconds depending on the athlete. What I'm looking for during this type of set is frequency training. If I'm asking Mark Henderson to turn over at a frequency of 1.15 seconds/cycle- which is how long it takes him to do one stroke, then I want every bit of that set done at that frequency. You find that when you so almost ninety-five per cent of your workload in the Endurance 1 to Endurance 3 category, a large percentage of your swimming is done at very slow frequencies. Because we do so little work at the higher frequencies I want to reinforce that fact by doing these type of sets. You will note that especially on these days, and I didn't point this out on the last one, that we do a significant amount of Endurance 1 training at the end of every day. We are trying to make sure that we flush everything out of the system. I really demand that they hit certain speeds in order to facilitate that.

This is total volume in a week of training. This is Endurance Level 1 and again you can see that we built up a medium peak here and a much larger peak through here prior to the real kind of anaerobic sequence. Again, this is EN2. The main emphasis was during the fall in the development period and

then another phase prior to our anaerobic sequence again in the spring. This is Endurance Level 3. You can see this is the February push. The May push we were a little higher in the May end than we were on the February side.

You can see here's the VO2 max with that first load in that February area, the second load right here in the May area. You can see this is the EN2, or threshold training, and then that precursor of threshold training. During the VO2 max load you notice that there is a significant drop in the amount of threshold training, and again a significant drop in the amount of threshold training as well as during this period of anaerobic load. I think it's real important to recognize that when you do get involved in VO2 max load that you have to reduce significantly the amount of threshold work that you're doing with your athletes.

I didn't put it on the slide because it made it too busy, but again the EN1 load remains fairly constant through this period. It does not change. Here we were going a peak of about 35,000 yards/meters a week and during this period I think here we were maintaining about 28 to 30,000 yards/meters per week, so not a significant drop off. But folks, if you try to do a lot of VO2 max and a lot of EN2, or threshold work, at the same time, you will find that after that period your kids will be very tired. If that's what you want, that's great. But, I've found that it is probably better to reduce the load.

During the testing period we do a variety of different tests. Monday is always the same easy kind of day — a preparation day. Tuesday we do an endurance test which involves either a T-30 or a T-20 depending on who it is, plus we do a blood draw and a blood scan of the athletes. Wednesday we do a lot of anthropometric, or flexibility, skin-fold type stuff. Thursday we do a curve

test which is a test of the aerobic to anaerobic continuum. This is a test of five two hundreds on four and a half minutes with a blood draw after each swim. We're looking at basically the relationship between velocity and lactate. The swims are basically from slow to fast. The object is to do two below threshold, one at threshold, and then two above threshold. They don't always work out that way, but that's what we try to start out with. Friday, we are currently doing what we call an active drag test. Originally we did a power test using Total Performance's power racks. Now we're involved in a test which is based on the Russian device that some of you know about. It's basically a premise that says you swim two thirty meter swims. We're timing them from the fifteen meter mark all the way across the pool to the backstroke flags. We do one swim free with no tether. We do the second swim with, as I described it in the manual, it looks like they're towing a sonar ring and looking for a couple of subs in the pool. It's basically a cable that has this device that they tow behind them. The device is a known amount of resistance. Looking at the relationship of the untethered to the tethered swim gives us an indication of how much drag they're creating. I'll show you a lot of facts and figures on a chart that explains this in a little while.

Then Saturday we do a kick test, pull test to add to the endurance profile, as well as some jump tests like vertical and broad jump.

This one is Sarah Perroni. I put this one in here because you can see when Sarah started she'd been out of the water almost a year. Her very first test was way back in October. You can see that she made a significant progression as opposed to say someone like Jon Olsen. Most of the time he was in the same zone which is an indication of his being pretty much at the wall as far as developing endurance. I might add that this line right here, this mark looks like Bryon Davis. Bryon is one of these guys who starts producing lactate when he takes a shower before he gets into the pool. Actually this is the best

result he had after the VO2 max sequence at sea level. Byron Davis is a guy who had a real hard time swimming these endurance tests. He started out, 1:31 was his first endurance test. His T-20 average was 1:31. The best endurance test he did, he averaged 1:21's or 81. He trained most of the year at speeds like that. It's just his body type, he doesn't swim real fast when he does his endurance training. It's important to understand the balance between endurance or aerobic and anaerobic training.

I'll show you what I found out. In taking all these tests I found out that of the group, of the entire group, the majority of the people had their best curve occur after the VO2 max sequence. Eight of them after the May VO2 max load at altitude. The majority of them had a graph that looked kind of like that. After we came back, after six weeks of anaerobic training at sea level the majority of them had graphs that looked something like this which basically says that these athletes had regressed, had gone backwards if you look at the plain facts, in terms of the conditioning, in terms of their profile, now granted they were very tired, a lot more tired than I expected them to be. It got my attention when my entire group looked like this after the sea level sequence.

This was twelve days out of the Nationals. Then five days before we went to the Nationals I did a three point test at the low end. I would say the majority of them looked something like this which to me showed that they were starting to recover fairly significantly at the aerobic end of the recovery process. The fact that this line was going up in this direction indicated that they were still not fully recovered on the anaerobic end. It's all individual. Some people did a good job of recovery. Some people didn't. I had one breaststroker who looked like death warmed over the entire meet and he could never get out of the gate at all. I also had a situation where Jon

Olsen was still going in this direction five days before the start of the Nationals and he had one of the best meets of his life. So go figure.

Let's come back to the Russian drag test. The Russians weren't interested in how many strokes these kids took to get through thirty meters. They weren't interested in the frequency of those strokes. They just knew that you did the first test and the second test, with and without the drag device. They were just concerned with the change in the time. The only things that they put into their computer to come up with the information is the time of the tethered swim, the time of the untethered swim and the weight of the athlete. I didn't like that. It's not the way I think. I'm real concerned with the numbers of strokes they take. I'm real concerned with what frequency their strokes are being done. The Russians are of the premise that both swims are of the same intensity. Now maybe because they've been doing this test since the late eighties, early nineties, and they've done it many, many times-they're conditioned to the fact that they've got to do it that fast. Maybe my kids weren't as experienced in doing this. But I've found that a lot of times there was a lot of discrepancy in the rates. Here's Summer Sanders' test on May 19. When she swam untethered her frequency was 1.16/stroke as opposed to when she did it on July 21 when her frequency was 1.06. Then on July 28 her frequency was 1.10. To me all those swims are different swims. The main thing that I noticed when we came back from the sea level training at anaerobic intensity was that we had a huge loss of what I would consider efficiency. You can see it consistently across the board.

Here's the difference of strokes on each of these athletes. You can see that on May 19 Summer went 19.77 over thirty meters then on July 21 she was 19.50. She was two-tenths faster, but she also took one and a half strokes more. The coach in me rationalized that it's okay, it's not a problem because we're closer to race frequency. The researcher in me said we're really tired

and we've got a problem. You can see one extra stroke, faster time, one extra stroke. Almost the same time, one and a half strokes more. The worst one down here-Olsen-took two more strokes. Here, Dave Fox took three more strokes. There were a lot of places where in every case except for Trip Zedlitz, and he's not even on the chart here, he was the only one who took the same number of strokes with a little bit faster time. So I retested them on Friday. We traveled on Saturday. Again we regained some of those strokes. In all cases you see we descended, except for Mike who was still having trouble at the far end. So we improved in our stroke count, but we still weren't back to where we were before after the endurance sequence.

Over here we're looking at the power output on each athlete. This is the efficiency coefficient. The lower the number, the more efficient. This is the amount of active drag. You can see the person that puts out the most power over here is Tripp Schwenk. He doubles almost everyone else in the group. You can see the relationship between Jon Olsen and David Fox. Jon produces almost a significant amount of more power than David Fox does, but his coefficient is a lot worse and the amount of drag it creates is a lot higher. If you know that David Fox is a very efficient, a very — I don't want to use the words "pretty swimmer," but I guess for now it's good enough — he doesn't stay too long in one place. Again, this is something that we're just getting to work with. I hope that very soon we will have an opportunity to again, in conjunction with the stuff that we're doing with ICAR, be able to put you in a situation where we can give you a way to do this test at home very efficiently, very easily.

I think after looking at it now, almost five different tests, I like it more and more. It's just one of those things. It takes me sometimes up to a year looking at something before I really understand what I'm looking at and

maybe understand how I'm going to go about the process of really incorporating that into what we're doing.

I just put this chart up here so you could see some of the testing information. These are Jon Olsen's T-30 tests through the year with the dates above. You can see he did the best toward the end of the EN2 load. The best average he had was 1:10.8 or 70.8. His best kick was about 4:45 which is a 1:35 average per hundred. This is some of the testing off the drag device that I've just shown you. His vertical jump remains pretty much the same. For whatever reason our broad jumps a couple of days before going to the Nationals weren't very good.

This is flexibility information. Again, these are all charts. I put this up there so you could get an example of some of the chart information that you can get in the manual.

This is one just to give you an indication of some of the results from some of the swims. You can see from some of the SP1 sets. Jon's best set was eight fifties on two and a half at 26.1, here with the fins and paddles at 24.4. His best kicking was 40.8. To give you an idea, some one like David Fox on the same kick set would average 34.4, 34.5. Actually 39.1 over here. His best five by one hundred was done in Corpus Christi around June 10 or so, and it was 54.1. This one was done around June 31 in Santa Clara-54.2 for 4. These are on ten minutes.

These are a series of seventy-five's we did. Here's an eight by one hundred set we did way back with a 57.75 best average. You can see basically, that to give you an idea to see from the continuum, Jon's EN1 speed, continuous pace training, was about 1:11 to 1:12. His Endurance Level 2 speed is about 1:08. When he did VO2 max he was in the range of 57 to 60. This SP1 set done in June was 57.7. You can see some of the top ends at 54.1 to 54.2 and he's a 49+ swimmer. I point this out to you because I remember a couple of years ago listening to Jack Simon talk to you about Joe Hudepohl. Joe Hudepohl when he did this type of set was 51+. He was pretty fast. So all the kids are very different.

This is what we're going to do between now and the Olympic Trials. Just briefly, this is our meet sequence that we're going to. Basically we're going to three meets in a two week format. In the November/December period-the Canadian Nationals, US Open, and the Kerr-McGee Invitational. In the Spring we are going to the Seattle Grand Prix and the US Nationals. We have two sea level sequences. One in October/November which is our VO2 max load period. We have one SP1/SP2 loading period during this January/February period. You would notice, of course, that we're going to do some VO2 max and other level work here, as well as during here.

I feel like especially with my 50/100 people that I've done a huge volume of training, base conditioning work. I did as much of that as I could this year. I'm looking at this. I'm going to keep them a lot fresher on a week to week basis. I won't beat them down nearly as much as I did last summer. I really felt like I probably extended the anaerobic sequence too long and got them too tired. I don't think that they were as productive, I don't think that they swam nearly as fast as I expected at the US Nationals and the Pan-Pac Games. This is a general idea of plans for the upcoming year.

Question: What type of pulling equipment on Jon?

He had the Strokemaker blue paddles and a pull buoy. Because I inherited a lot of kids, I don't want to dictate to them exactly what they should or shouldn't use. I allowed them to use the kind of equipment they were familiar with and comfortable with. If they didn't want to pull with paddles then that's how they did the test and that's how they trained. If they were going to do pulling work with paddles, then that's how they tested. It was just to extrapolate a training speed for pulling.

Question: When did you do three a days?

I did three a days during the early part of December for two weeks during the time I considered aerobic endurance. It got pretty exciting with a couple of the sprinters.

Question: Are you planning on attending US Nationals before Olympic Trials?

Yes. We've just done the anaerobic load. We'll probably have about three or four days of aerobic training going in so I would expect them to swim pretty fast unshaved. Does that answer your question? Any other questions?

Question: Who does the T-20 and who does the T-30?

The 50/100 people do the T-20, the 100/200 do the T-30. I have some stroke people in the middle, like the IMer's, go a 2400 IM, which is basically twelve two hundred IM's back to back. It's pretty simple. DePold, Van Dyken, Davis-Byron Davis are T-20 people. I train Fox pretty much the same as I train Jon Olsen all year which is in the middle distance group. He swam T-30's all year in the middle distance group. I only changed his program starting in week thirty-four, which is in the summer.

Question: Do you have long distance swimmers do T-35 or more?

I don't have long distance swimmers.

Question: Despite the availability of all the things you have in Colorado, what are the differences in what you're doing now and what you did when you coached in college?

That's a good question. Here I think I'm really able to focus all our energies in the summer. I'm looking at a twelve month plan. You're really able, especially if you're looking at a twelve month plan, to do a huge amount of volume endurance work all the way through the year. Ideally, if I'd been given this program with another year to work I would really have taken an entire year devote it entirely to endurance training entirely. I wouldn't even have bothered to do sprint work. You notice in this plan that I only sprinted them in June and July. The rest of the year we spent working in endurance

training. I think it's really critical to the foundation in laying a platform for what you want to do in the summer. I honestly believe, looking at the difference between what I did in college and what I do now, that there are just too many distractions. There are too many limitations on college coaches if you follow NCAA rules, which hopefully no one does. I can say that now. I'm not a college coach. There are just too many things that are going to get in the way folks.

The other mistake I think a lot of people make is that a lot of people get confused because they're very successful in the short course yard season. They get into the mind set that what worked for short course yards is going to work for long course meters. I think they're being fooled. It takes a whole different type of training to prepare athletes for long course meters. You cannot do the same thing that you do for yards and expect the athlete to be successful long course meters. During this year we spent maybe ten percent of our training in a short course format whether that's yards or meters. The rest of the year, the entire time we trained fifty meters. We didn't lose any speed during our training. We didn't have any loss of speed at the end of the year, although I felt like we could have swum faster. I felt that we consistently swam fast. I think that's just because I did a much better job of maintaining their speed during the year while I loaded the endurance systems. But, again, it's really hard as a college coach.

Question: When you look back over the year do you think if you concentrate on long course swimming, short course swimming would be pretty fast?

I think it is. Again, that's my opinion. We went to a meet in Oklahoma City in December. We came off a couple of weeks of really high endurance type

training, EN Level 2 threshold type training. We worked out Thursday morning before we went to the meet. As I say we did about 50,000+ yards/meters before we went to the meet. We worked out each day of the meet in the morning before we swam prelims. To give you an example, Amy Van Dyken went 22.4, 49.5. That was way beyond anything she'd ever done in college. In fact the majority of the group swam as fast, or faster, than they had swum, unshaved, during any collegiate season.

Again, to me it was a good indication understanding the balance between aerobic and anaerobic, and it's a seesaw folks. If you sit too hard on one end you're going to lose the other end, if you sit too much on this end you're not going to have any speed. It's a very, very delicate thing. It's something you have to understand. If you don't, you're going to hurt on one end or the other.

I personally feel like I sat on the one end too much last summer. I only know that because I have a lot of testing to support that theory. My personal opinion is to train long course and do a great job of maintaining your ATP-CP explosive system. Make sure that you do every day, every practice, something extremely fast but not over twenty meters. It should involve starts, turns, finishes, and maybe swims. Take the time to do it well. For me a normal thing like that would be five times twenty meter sprints on two and a half minutes. That's a lot of time. That's like half an NCAA practice, isn't it? Pretty close. But I can take the time. I have all day. These guys aren't going anywhere. That's real important.

We just finished a collaboration with ICAR on looking at hip velocity. I know Ernie talked a lot about who do you believe, Bernoulli or Newton? Which

theory do you follow? We just went through a week with a total Newtonian guy. That's all he could think. That's all he preached. It was really interesting because he had a different way of looking at the sport. We pre and post tested the entire group with a control group involved. I Can't say what the results are because we don't have them back yet. But we are doing some things like this with our group so we get good testing at this elite level.

I have also introduced the group to the psychological impact of race preparation. That's one of the big voids that we have in United States Swimming. We don't have any psychology program at all. Non-existent. I've discovered this guy out of Eugene Oregon that is very intriguing. He calls his system Knowing Awareness Thinking. He has no degrees, none whatsoever. No psychology. He's just one of these guru looking guys with a beard. He looks unkept and walks around with the mad-scientist kind of look. But he's done a fantastic job, up to this point, of talking and sitting down with part of my group and knowing exactly what makes them tick, just by a short evaluation period.

These are just some of the things I'm trying to do with this level group. Hopefully all this information comes back to you. The learning that we have from this group goes back to you. That manual, everything that I've done this year, is yours to look at, yours to get and utilize. I will say that if you want to give me a call, discuss things, I'm very open to it at anytime you want.

Question: Could you just address the plyometrics? Is that a progression or a change in energy?

We start out with very quick repetitions. We do reps of maybe eight times or two sets of eight. We build up to where we go quite a lot of sets, or reps of an exercise. Then we slowly progress to where we limit, in the end, only upper body. We do all our lower body doing starts, or explosive starts, off the blocks. So its a build up to a platform and then a decrease at the end.