

Rupert Neve Interview 1 May 2001 Wimberley, TX  
By Steve McAllister  
Photos by Spencer Gibb

Key: RN: Rupert Neve; SM: Steve McAllister; SG: Spencer Gibb; MP: Mark Phillips

On May 1<sup>st</sup> Spencer Gibb (photographer, musician & studio owner) and I headed down to Wimberley, TX to spend the afternoon with Rupert Neve. It was great. He was very kind, spent nearly 3 hours with us, answered all questions, and showed us around his workshop. His contributions to the industry cannot be overstated and I will decline the temptation to try.

Helping with the interview were a number of TapeOp writers who submitted questions. While we didn't cover all, we did touch on most of them

Also present were Rupert's assistants Mark Phillips and Kevin Burgin.

**SM: When you are designing something you've done before, a mic pre for example, how do you approach it freshly?**

RN: Not easy to give a general answer. First questions, what is the mic pre for, what sound pressure levels do you want to cover, what kind of mics will be used, etc. We would then adapt circuitry we've done before, look at the devices that are currently available, then put together a design that would suit the application.

My main interest has always been in high quality sound recording of real sound - classical music, choral music, and so on. I would always try to give you the best quality that the job deserves. Again, it depends what you're going to be using it for.

Originally the first semiconductor designs we had had a hard job getting low noise which we used to get with tubes. Today that isn't a problem, and today it's a question of providing a range of gains which will suit most of the applications and different microphones so that we might have a general market. And to an extent, the design is not a cheap one and I'm not interested in doing a cheap design; you get the best that I can do for the application.

Having said that, the mic pres which we are currently using all have a very close resemblance for their purposes, because once you have a good path you don't want to go away from it too much. We change the devices from time to time, find better ones. Kevin spends a lot of his time in contact with the people who manufacture these devices so that we're out there all the time with the best - not just the latest, but the best.

The things which I have always found interesting ally what I do with the field of acoustics. I was involved at quite early stages in designing buildings. I am always soaking up the sound, I walk into a room and it's second nature to me. Sometimes I find it quite irritating - flutter echoes, a character of the sound you don't like, and I might not even be thinking of it remotely in connection with any recording but I know I couldn't record there.

**SM: You have done some sound recording but it's been a long time.**

RN: It's been quite awhile.

**SM: Why?**

RN: Well, first of all I have to earn a living. Just after WWII I was running a little recording/public address system, and, like I'm sure we all know, there's no money in it.

There's a lot of interest but there never was any money, not at that level anyway. We used to record brass bands, male voice choirs, and choral society during the winter and we used to do public address for shows in summer. When the time came when I met the girl I thought I would like to marry, I had to go and talk to her father (in those days you did that); perhaps she said, "you better go and see my father to see if he'll allow this".

He was a very strict, Victorian type of gentleman and he sat at one end of a table that seemed to be a mile long and said, "What do you do for a living?"

I said, "Well, I do recording."

He said, "you do what?" He'd never heard of it. To him, a recorder was a gentleman who sat in a courtroom and wrote down the proceedings.

"No no, I'm not a recorder, I do recording, and I explained from the ground up what it was."

Bear in mind that in those days there were no such things as tape recorders, we had just emerged from the war and I knew about tape recorders, but we were using 78rpm disc recorders, recording onto acetate. So I had to explain to him what I was doing and he was not at all amused, thought that was a tragic case for a job. He asked me, "Will you be able to provide for my daughter in a manner in which she is accustomed?" - a loaded question: if I'd said 'yes I can' I'd be insulting him, if I'd said 'no' he might've turned me down. So I said, "No. I'll go get a job."

He said, "I hope you'll get a proper job. Come back to me in a couple years and see how you're getting on." I didn't want to wait a couple of years, I mean, we had it all settled up.

Doing recording was great fun. The industry didn't exist, there were about four recording studios in the whole of the United Kingdom at that time. I didn't have a studio, we had a room which we used to rent over a music shop. The old boy who ran the music shop would play the piano. We had a lot of fun recording whatever. And of course we recorded straight to disc there was no second chance so you had wasted your blank if you didn't get it right. You'd be surprised at the people who fancied themselves singers. They'd have been to the cinema and seen these film stars with a mic held up here and thought that was the way to do it, so we would give them a mic to play with and have the real mic a few feet away. (Laughs)

**SG: We're still using the same tricks today.**

RN: Well we initiated that one. You don't argue with the client.

**SM: No, you just fool them.**

RN: So I went and got a job in London with a company that ran cable-radio. I found myself designing amplifiers, pre-amps, and making it sound good, doing equalizing on the lines and so forth. I found myself more or less in charge of the audio of the group and learning electronics.

But the *sound* always interested me, recording in, say a chapel which would have a short reverberation time, fairly tightly packed with people, a lot of wood paneling and fabric around, compared with an Anglican church which would have much larger internal volume, much more hard surfaces, much less fabric, much less woodwork, and a longer reverberation time. I started learning the difference between buildings made of sandstone or hard marble (such as you get in Italy or Spain), and I became really hooked on these finer nuances of sound.

I had to go into transistor amplifier design which was a whole new thing. I was working

for a company that was making transformers and I became the transformer designer; the guy who'd been designing transformers came to me one day and put this book on my desk. I said, "What's this book?"

He said, "That's a book on transformer design."

I said, "Why should I be interested?"

He said, "Because you're now going to be the transformer designer for the company. I'm leaving." (laughs)

**SG: That was your introduction to transformers?**

RN: Yes. So I read the book and I called the different suppliers, got a lot of cooperation from those chaps. I was in close contact with a couple of people whose names, in those days, were really the top of the transformer field, Brian Savage who worked for a different company, there was Mr. Partridge. Before the war Partridge Transformers were very famous, high quality. I went to see these people, they were all very gracious, and taught me what to look for, how to do it, and I got bit with the bug.

Then I became chief, and in fact only, designer for this small transformer manufacturer, and saved some money when we found we could manufacture transformers which worked just as well for half the money we were previously spending. I worked on new insulation materials - all transformers in those days used paper insulation, sometimes varnished or waxed, and this limited the temperature that the transformer could work at. If you went too hot it would carbonize or burn - not a good idea. I found there were passive materials that you could use which could take much higher temperatures and were just as cheap and were actually easier to use. I got manufacturers to make it and this insulation was far better than paper. In fact there was one occasion I remember my boss, the owner of the company, came in one day. I had just finished testing a transformer and the final test was just a 3,000-volt flash test for the insulation. He put out his hand to pick it up and it shocked him. He said, "How did that. . . it's not connected to anything. How does it do that?" Well, there's capacitance between the primary and secondary, and the insulation was so good that although it had been sitting there for 20 minutes it held the charge. It didn't do him any harm but he got 3,000 volts through him for about half a second - and discharged the transformer for me. Very impressive.

So audio transformers, which I learned to design. Manufactures started coming to us to get high quality transformers at lower prices than they had been paying others. Even in those days high quality transformers were expensive.

It all added together when, finally, I left that company and started on my own. The first thing I did was design a bookcase-style speaker. It was one of the very earliest high-quality, small size speakers. High quality in those days meant huge, great big corner cabinets with sand-filled baffles and goodness knows what. They sounded terrific but were not very practical. Anyway, it was the first of these and we got good reviews on it, and it sounded nice, but again, there wasn't any money in it. This hi-fi, people just didn't know what it was about. The UK was 2 or 3 years behind the US where hi-fi was becoming established; this was in the late 50s. In England the houses were smaller, budgets were smaller, people didn't have the same interests, and it was very hard to get anybody to buy stuff you were making, whether it was good or bad. Slowly that began to change.

I already had some contacts, and one studio owner in London commissioned a mixing console, which was tube. And he liked that, and then we built him another one, and he

liked that. In fact, at N.A.B. the other day a gentleman who collects these things came back and showed me a photograph of Number 2, he'd bought it.

**SM: Is that the 10 channel with the dials?**

RN: That's it.

**SM: I've seen it on the web** [<http://www.socalproaudio.com/consoles.html>]

RN: Oh, he's put it on a website? Well that we sold for 450 pounds, and he paid \$27,000 the other day.

**SM: I'm not surprised.**

**SG: How much work went into it - how long did it take to put together?**

RN: Three weeks.

(stunned silence - mouths open)

Well I can tell you that because Leo Fellini who was the studio owner, called me one day saying he might have a contract to do a show every week going out on Radio Luxembourg (this was AM radio) and he'd need a console for it. We discussed the details and he asked how long it would take me to build, adding that he wouldn't know if he'd get the contract until 3 weeks before the first concert. And as he couldn't afford to buy the console without the contract. . .

This was the design, the whole thing, transformers, output transformers, all the tube circuitry and so on. It worked well, in fact, that particular console was actually working and in use until about a year ago.

About 3 years ago I was in Singapore and they showed me a console which I had sold them in 1967, this was a semi-conductor console, one of the very early ones. And they had it all polished and clean and so on. I remember selling them that console and I sort of put out my hand and was stroking it and they told me not to touch it. I asked, "Well why not?"

They said, "It's on air." They'd maintained it and looked after it, but these things just go on and on and on.

So, it was a good opportunity as there was no competition. There were German makers of consoles and a couple of British makers - none of them would qualify today as quality products. The Germans built meticulously engineered, beautifully made stuff, but very clunky, very difficult to use and they were very arrogant. This was just at the start of the pop revolution and so studios and engineers began to know what they wanted and they would go to the current manufacturers who'd say, "No no no, you cannot have this, this is not the way we do it." And I had the opportunity of talking to these folk and finding out what they really wanted, why they didn't go to the competition. And we built consoles, For a number of years everything we built was custom built, we got a reputation, and did it well because we were so scared of a thing not working we'd over-engineer it.

Leo Fellini, who had ordered the two tube consoles, specifically at one point asked me, "have you heard about these transistors."

I said, "Yeah, I've heard about them."

"Will they ever be any good?"

I said I didn't know, and hoped not or I'd have to learn all over again.

But I quietly went back and bought some transistors. Didn't like them at first, but then I had a breakthrough. I was designing microphones for the Royal Air Force. Stuff for use at high altitudes - not high quality but very durable. And the mic they were using was a

carbon mic which has a very high output and is very reliable, if it goes weak you can give it a shake or bang it and it starts up again. But it does not like high altitudes. I was talking with the Ministry of Aviation officials and they were laying down all of what they wanted. I asked, "What is your actual objective?"

And one guy says, almost as a joke, "I want to talk to people on the flight deck as easily as they're talking across this table now."

I said, "There's no reason why you shouldn't, but can you pay for it?"

We did a carbon mic and a rocking armature mic, then I went to a collar microphone but it had no output. Aircraft are full of high current cables running everywhere, all electrically operated, big solenoids, great big spikes everywhere, noise noise noise. So the carbon microphone had the advantage that it was low impedance but high output. So to get high output from a moving coil we had to give it an amplifier. There was no way we were going to give it a tube amplifier, so I started on this transistor design, and after a bit I found that you could actually do things. We made it, electrically, look like a carbon mic 'cause all the aircraft were equipped with carbon mics, so you could plug it in and it would be fed to the same volts and currents and so on, same output level, and they were just over the moon, it was great. Then they discovered that the moving coil unit was made in Austria and said, "we can't buy them, we've got to have them from the UK". But nobody else made them - so we either had to buy enough to see us through the next great war, in case Austria was on the other side, or buy the rights to manufacture them. So I said, "What you need to do is buy enough and get the drawings . . ." That was where I first met Bernard Weingartner. Bernard was, at that time, the chief designer at AKG. He started Neutrik sometime after that. They'd make a huge number of moving coil capsules and they did them quite cheaply, about 3,000 per week; aiming mostly at the European telephone market. They would have a quick scan of response and sensitivity, then bin them, the top bin being the high quality - mics for recording, the bottom would be for telephones, and we got something in between for the R.A.F. But it was all the same design.

**SM: When you are testing gear - say an EQ, what are you putting through it - test tones, music, both?**

RN: Well, we listen to music mostly, there's some favorite stuff I listen to. But it's so predictable.

**SM: How so?**

RN: Well, first of all the original concept comes still comes from the position, not from me. They tell me what they want, a bit of this or a bit of that, then I come back and play around. For a quick check of what it's doing I will either use pink noise -which is very revealing- or put it on the scopes and see what it does. We've got frequency response, which is sometimes regarded as not that important, but a 1/10<sup>th</sup> of a db deviation in frequency response in the 20H - 20kHz range can make a very subtle difference to the sound. We have to make sure that it's either dead flat (quite beyond those limits) or we have to know why it's not flat. You take most present day equipment and they don't work to those limits. They say it's flat, yes flat within a db, even half a db, sometimes better, but when you really get down to it those little differences -the golden eared people can hear it - they might not know that it's a frequency response but they know that it's different. They either like it or don't like it.

The greatest satisfaction that I get is when I have a new piece of equipment and

somebody who really knows, a really golden eared person is playing with it. Occasionally it happens. You find that the EQ, which might have a range of +/-18 db, and he's moving it just a fraction off flat. I've had this, I suppose, three times.

Once, way back at AIR Studios with Geoff Emerick I was doing just that, checking out the EQ. Other people had already checked it out and they were winding controls back and forth saying, "oh listen to that, listen to that bass", but Geoff had everything flat, then started moving just a tiny fraction and he'd say "Ohhh, would you listen to that!" It was doing what he wanted it to do.

The last time it happened was in New York about a year and a half ago when the Summit unit was being demo-ed at Sam Ash. Frank Liapetti came in. I didn't know he was going to be there but he came. I know the guy, he's one of the top golden eared people, and he says, "well what's this we've got here?" I told him the improvements we'd made and he did exactly the same thing. He'd brought a CD of his own (and I don't think a CD is way to go with these things but he had just finished it) and he just moved the knobs ever so slightly. He said he wished he'd had it a week earlier when he'd been mastering the disc. He didn't appear to have done anything - that was the acid test.

**SG: I've heard a lot of stories about Geoff Emerick's ears.**

RN: Well he still does that. I'm sending him some new stuff to see what he thinks of it.

**SM: Would you like to weigh in on the analog/digital debate?**

RN: Well I suppose digital will be okay one day. But you've got more than a generation of people who've grown up with compact discs and do not know what real sound is like. They don't go to concerts, they don't even go to church, they don't listen to their analog church choir, which is a good source - it may not be a good choir but at least it's real voices. So they have no basis of comparison. They've grown up with digital and so digital sounds okay.

But the resolution just isn't there. You cannot get proper separation from a stereo channel, digital just won't do it. Just try and envision what happens with a 10kHz-wave form with some harmonics in it - you can't resolve anything above the 2<sup>nd</sup> harmonic anyway, and now if you slip that between two channels what's it going to tell you? Nothing. There is no separation.

So the limitations of the current systems are well known but they represent a quantum step forward in usability compared with the LP, the cartridge, the messy noisy disc (well, the discs weren't messy and noisy unless the kids got hold of them and they were maltreated). If you kept your stylus replaced it is extremely good, in fact I'd prefer to listen to vinyl anytime.

But it is a convenience, a fast-food type of approach that is very successful. Not very nutritious. Now we are moving away from that. The digital designers themselves are not audio people. We had a certain company (we won't mention names) come here one day last year with a new converter they wanted me to endorse. The dynamic range they quoted was 120db. The dynamic range we measure was about 106db. They wanted to know how I was measuring it - the only way I know how, audio in/audio out; that's what counts, that's what you're hearing. They wanted to know if I could measure it in the digital domain, and I could, but that doesn't tell anybody anything. So they then wanted to know what dynamic range it should make.

Well, a big console - say a 9098- has a range in excess of 126 db; why should we settle for anything less? And if we ever felt threatened we could shoot it up to 140db. In that

bracket, dynamic range is not the most important parameter. Frequency response well in excess of the audio path (and a lot of people have done work on that now) show the brain actually reacts against the restriction of frequency response with the electro-magnetic brain-waves that are associated with frustration and anger if it doesn't get the frequency response associated with the signal it's supposed to hear. Now it doesn't happen with everybody because it's working against a databank. If you have a stored databank of knowledge of what a concert in the best hall sounds like, you're comparing it. Your decoding mechanism is taking care of that and it is saying it is not the real thing, it's got stuff missing. Now you couldn't listen, then sit down and write, "I think that the frequency response is 3db down at 35kHz", but the brain actually knows that and compares against the databank of experience. It simply reacts, knowing it isn't right, it doesn't fit.

Having said that, there are systems coming along now which do give us the frequency response, quite adequate dynamic range, and actual harmonic distortion.

I could show you FFTs of quite well known amplifier stages that come with wonderful figures but you'd be horrified with what they actually do. Compare that with the refined version and the sound is better, cleaner, more solid; truer. Interesting thing is if you start with sound quality which is very good, that will reflect right through the digital system, you can hear it, even through radio transmission.

**SG: Don't you still end up with the problem that no matter how much you expand the frequency response it's still going to end up on a 16-bit 44.1 CD? Won't you still lose echo and reverb tails if you go to that format?**

RN: Well, if you do that that's what happens. The Sony single bit streams does have a 100 kHz playback and 120db of dynamic range. I have to take my hat off to them. They've got this dual CD player which will accept both types of CDs. So you buy their super-expensive CD player you've got this wonderful, really good high frequency response, low distortion, low noise; it's enough to satisfy even me. But if you don't have the discs the same piece of hardware will play a 44.1 - I think it's a brilliant piece of marketing. If they make it stick my respect will be enormous.

I see now that JVC -who were the originators of that, by the way- has come up with a system. I haven't heard it but JVC are one of the best of the consumer audio people. I was in Japan at a press conference, and I get asked the question all the time what do I use for listening, and I usually don't discuss that. I'd been evading this question. Finally I saw no way out, and through an interpreter I said, "I just use a very ordinary hi-fi system with a JVC amplifier." And there were a bunch of engineers from JVC at the back of the room and they started jumping up and down and shouting, "What model? What model is it?" They're about the only people who understand to not present a piece of equipment with crossover distortion, and simple things like that. The noise floor isn't as good as I'd like to see it, but it actually sounds better than most. And a darn sight better than 85% of the hugely expensive, real high-end audio stuff.

**SM: I had the digital/analog experience after I'd read a report about decreased brain activity when listening to a digital as opposed to an analog source. So I put on the only music I had in both formats ["Wha'ppen?" by The English Beat]. The CD was great, real clean and I was bobbing my head a little bit. Then I put on the vinyl and the difference in feel was much greater. I wanted to dance across the room.**

MP: My 4 year old son prefers the vinyl. I've got a Peter, Paul and Mary CD that he had

been exposed to for years, then I got the record out. Now he only wants to listen to it on vinyl. During Christmas on KUT [great local college radio] the DJ came on and said, "Yes folks, that one was on vinyl." People were calling and asking. They could hear the difference whether they are aware of it or not.

RN: So there are these subtle differences.

**SM: I am amazed that over FM there would be that much of a difference.**

RN: Well, it's very subtle, and we could theorize about why it happens.

**SM: But it did.**

RN: It did.

About 3 or 4 years ago, soon after we first came here, I was listening to KMFA [local classical station], just kind of playing in the background, and something drew my attention to it and I turned it up a bit. At the end of the piece we were told that this was a concert from Studio 1, CVC Montreal. That was the first 9098 console. I recognized something about the quality of what came through that console. Even with all the connections of landlines, satellites, and frequency limitations, the sound really sticks to you.

You know there's much more to it than just sounds. I'm sure one day we'll find out more about it. The human design, if you like, is infinitely more complex than we ever think it is. If we accept that, and accept the fact that we really don't know all the answers, and created in the image of the Creator, so we are aspiring to that. He is the key to the whole thing, He created everything perfect and man messed it up. You can bring in all the theology, but the basic is God created me and gave me ability to perceive certain things. It's still a mystery. It doesn't matter how much I discover, and I often think I've reached the top "this must be the answer", but not very long after that I'll find that I'm only on a peak and there's a whole mountain range of peaks above me waiting to be climbed. That's why I find it still so exciting, there's still so much waiting to be done. I still like to get into it and find out 'why'. We think we're really clever when we design something, but we're only uncovering what He's designed in the first place.

**SM: In a way isn't this all an imperfect science, in that, no matter how good recording gets it will never match the original?**

RN: We're getting reasonably close. Some of the film boys are doing some very realistic audio -still digital, still limited- but they've learned some neat ways to make it sound good. I'm not talking about the bangs or the car chases, but there is music that is sometimes very nice to listen to, though still limited by the quite low-grade system they're using. One of the things that concerns me is Surround Sound: if you can't resolve anything above 10kHz spatially with 44.1, then how are you going to resolve anything meaningful with six channels? The answer is that you can't. You can do dynamic panning, position the sound to come from here or there, all you're doing is, in effect, moving the sweet spot around (you're taking the differential sound level between two speakers, but it will not differentiate phase - it just isn't there). You can change the level and move the image but not the ambient. That's all the difference between a stereo recording with a cross-pair in the studio, even for a soloist there's moving. It's quite different if you don't have the sweet spot. The position stays there, whereas with mono that is panned, you've got the same signal and then the only 'sound forward' is when you're in the sweet spot - you get the actual rendition of the music. But with stereo you've always got sufficient non-coherent material which paints an overall picture. Of

course, if you've got more than a single voice or instrument, you've got a panorama.

There was one studio that asked me to listen to a 'wonderful recording' that they had made last week, and I asked if they'd ever thought of recording in stereo. They said, "It is stereo." I said, "It's panned mono, you've panned the image to three different places. That's not stereo. Try doing it in stereo, at least have *some* of the material in stereo and you'll find the whole thing comes to life." If you're going to remain in business as a recording studio in the day of Surround Sound, you've got to accept the fact that won't be long before people become more perceptive and they will want the experience Surround Sound can give them. It's not just a question of aircraft moving across, car chases, bombs going off, or big, impressive stuff - it goes back to the original stereo ping-pong set where the salesman had to prove that the *ping* and the *pong* were coming from two different speakers. One salesman said, "If we're going to ask someone to buy two speakers we've got to show him it's got two speakers." That was as naïve as it could get, but the experience is what I think is important.

I don't care whether you're sitting in your home recreating a little club on 6<sup>th</sup> Street or a big concert hall, you're recreating an experience which is, technically, possible. At least for a recording engineer who's got their act together. If you have almost any reasonable Surround Sound system you can actually reproduce that stuff very convincingly. But if you don't record in a genuine spatial mode it will sink into the oblivion that other systems have gone into.

**SM: Like Quadrophonic.**

**SG: I've been hearing stories of people who have been mixing these old recordings for Surround Sound 5.1. How do they do that if it wasn't recorded that way in the first place?**

RN: But you see, if you've got a stereo track, you've got your coherent signal and you've got all your other stuff. If your microphones are very directional you've got less than if you've got omnis, but you do have a huge amount of atmosphere there. Now if you cancel out these two, put them into opposite phase - you can do this with an MS circuit where you can null-out the sum and leave the difference. Now you can amplify the difference. The difference is the non-coherent sound, the reverberation of the room, studio, other stuff going on which is not pair of identical signals. Add that and you've got the panorama. Now you can reuse that panorama, reposition it as needed. From two tracks that have been well recorded in stereo you can actually recreate 5.1.

If you have access an MS a/b converter, just try that. The MS matrix will null-out the coherent signal leaving you the incoherent signal, and if you have access to that side-chain, give it some more gain through the console, bring it back to a pair of channels and add it in. You can turn a small concert hall into a big concert hall. That's just one of the many tricks you can try.

If you really want to get down that track, go and see Billy Stuhl at Masterpiece Mastering. He's a mastering engineer who uses techniques of that sort -he's shown it to us just recently. He'll get a tape of something to master and it sounds awful. So he's got to do things with it. He can take you all the way from front seat, where the orchestra is right there in your face with very little reverberation, or he can put you right at the back of the hall or somewhere in between. Adding reverberation that is natural to the signal, he's not adding anything. Now that, that's mastering. He can take something which has been recorded in very different surroundings and make it sound as if was done in the finest hall

in the country. At nulling and summing and differentiating he's a past master

We have some very powerful possibilities. The main thing is to start with a good signal.

**SM: What kind of future do you see for analog tape?**

RN: It's being increasingly recognized as a really worthwhile medium. The medium itself is improving. I'd like to think the recording process will improve as well. There has got to be a demand for it. At the moment everybody is all starry-eyed about digital, and that's okay, it's improving, but I think there are tape improvements that could give us more dynamic range and wider frequency response. I've often wanted to get into it myself but I've never had the time or opportunity.

**SM: Despite the current love of digital, I know quite a few engineers who went down that road, hit the wall, and have come back to embrace analog. Consequently, the gear has shot back up in value.**

**SG: Or they've got ProTools and have realized they need a high quality front end.**

RN: You mentioned ProTools. The processing power is limited, it's not a very good mixer. Most of these digital devices are not. The other thing is that a lot of that is at very low levels. We have a device coming market fairly soon which depends on very high resolution in the 'threshold' area. There isn't any digital device that can do it. We're limited to that last significant bit resolution and the thing starts to dither. We need to go a lot further with digital before we can do some of the tricks we can do now. People don't realize this. They accept that it doesn't work as well, sounds flat and uninteresting but use it anyway.

**SM: Do you think we're more critical or more relaxed concerning how a device sounds?**

RN: A hard one to answer without qualifying. I don't think we're more critical because I don't think people have the point of reference on which to base a true comparison. But it depends on who you are. If you're one of those who buys a car and only inspects how big the speakers are in it. . .

**SM: Do you have any musical training?**

RN: No.

**SM: No singing, no choir?**

RN: No, absolutely.

**SM: I am very surprised by that though I'm not sure why.**

RN: I used to record these choirs and bands and I could not read a note of music. When we were recording on acetate and there was this record spinning around at high speed, we would time the rehearsal and check it against the bars of music the piece had. The records could hold about four and a half minutes of music and we couldn't go much over that or we'd record right into the label. But my partner was the one who could read music.

**SM: Are you surprised to know that people like to overdrive your old class A gear?**

RN: I'd be surprised if they actually overdrive it because a feedback amplifier has similar characteristics, whether it's Class A or any other class. A lot of people attribute Class A to amplifiers which are not.

We've just started a website, rupertneve.com. It will be up in the next few months. We get a lot of questions like, "I've just bought this console, do you remember it?" What they don't realize is by 1978 between SSL (our number one competitor) and ourselves we were selling 25 major consoles a month, and hundreds of smaller ones. It was quite

impressive. Between 1971 and 1981 there were thousands of consoles built.

What we'll be trying to show on the site are the base configurations and designs of the different vintages. The very original transistor designs were germanium transistors and they were certainly all Class A. We then went over to silicon transistors, and keep in mind these were very difficult to get. In 1965 the only germanium transistor that came anywhere near 'low-noise' was made by Texas Instruments (I still remember it was part # 23309). These cost us 2 ½ pounds each (currency rates were roughly \$3 = 1 pound). I would call up the T.I. folks in the UK and order a hundred (two per channel x 48 channels), but they only got an allocation of 24 every three months - even at that price. It was a constant fight. I had to call friends in the U.S. to see if they could get them. That was how difficult it was.

Eventually we got away from those. There was a UK manufacturer that started to make transistors. When found them we were in desperate need of a hundred. My wife went across to get them and came back with the transistors but she was very worried. She wasn't sure they'd be any good. They were stamped with the type number right as they came off the line - they could have been anything. They worked, not quite as good as the Texas ones, but they worked.

So later on we got into more efficient though they never, in my opinion, sounded as good. A lot of the consoles from about 1970 onwards made use of these. In the mid-70s we got a lot of the chips. So we have three different categories, basically, but the golden oldies are the best.

**SM: Truly?**

RN: Yes, we can show it. We just sent off today some items that were loaned to us ('cause I can't afford this stuff) from Fletcher at Mercenary Audio. All original. There's something about the character of the sound you just like, though it's very hard to measure the differences. In fact, when we measured it we thought, how in the world did we make it that good in those days, especially when we didn't have the gear to measure it with?

We're now going back full circle. We'll have new stuff that will have an old school type of technology.

**SM: That's great. Any ETA?**

RN: Oh, a year or so.

**SM: Thank you very much for spending time with us today. I have one more question that was submitted by another TapeOp writer: when was the last time you used a slide-rule?**

RN: (laughs) Let me see, about 1978.

After the interview Spencer and I were shown around the workshop where we were able to play with the scopes, check out the set-up and talk about some works in progress. As I've had a lot of questions about Rupert's listening set up, here's a little info in addition to what was in the interview. Two sets of monitors are used. The first are of German manufacture (apparently they are not normally imported to the US) and according to Rupert, "have a ribbon tweeter and are highly accurate." The second set is a common US brand. They are used so that the designers can hear how most people might hear their gear, but we were asked not to reveal the manufacturers.