50 Years
1951-2001
in Pro Audio

NAGRA PL-L Line Preamplifier
NAGRA-V New Hard Disk Recorder
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NAGRA-D Users' Reports
Nagra PL-L
The Power of Music

After receiving extremely positive international response to the first products targeted to the audiophile marketplace, Nagra introduces one new addition to bolster its high-end product line: the Nagra PL-L preamplifier.

The Nagra PL-L is a Pure Class A vacuum tube line preamplifier, based on the proven design concepts of the world-renowned Nagra PL-P. Its jewel-like machined anodized aluminum case features input source selection, balance and volume level controls, as well as a precision modulator for system level matching.

The Nagra PL-L provides four line inputs that include one XLR unbalanced (asymmetrical) and three RCA single-ended. The outputs of the Nagra PL-L are directly coupled to the output vacuum tubes, specifically to ensure the highest audio performance. There are two unbalanced sets of RCA stereo connectors to allow bi-amp setups. One XLR stereo output is also provided. It can be either used as an unbalanced or, as an option, balanced and floating connection with very high quality transformers. The level of the output connectors can be modified to match the specific level of the amplifier.

The power supply system reflects long-serving Nagra philosophies. It is designed to deliver quiet and stable performance suitable for the highest quality audio system. It is completely isolated from AC line noise.

The optional remote control is implemented for selecting the different input sources, adjusting balance and output level. The remote control unit can be used as a common device for different Nagra high-end products.

This accumulated expertise in developing high performance analog circuitry and precision machining has now spawned a family of standard-bearing products for the discerning audiophile. With the PL family of pre-amplifiers and the MPA and VPA amplifiers, Nagra is bringing ultra-high performance, superbly reliable alternatives to audiophiles who aspire to build music systems that will provide world-class music performance with lasting investment value.

Nagra-V
A Reality not a Dream

The introduction of the NAGRA III back in 1957 gave sound engineers the world over the possibility to record location audio with a versatility not previously enjoyed. Radio reporting and later film production was revolutionised by the little Swiss recorder. The NAGRA III rapidly put the NAGRA name in the forefront of people’s minds and paved the way for a succession of products, many of which in turn became industry standards. With the arrival of digital audio in the mid ‘80s there were rumours of a NAGRA to replace the older analog recorders of the ‘50s, ‘60s and ‘70s.

In the early ‘90s NAGRA did produce a digital machine, which was not designed to replace the traditional on-the-shoulder market of the III and IV series. The NAGRA-D was aimed at...
the real top-end of the recording market. The reason was that there was no truly professional medium available to replace the trusty NAGRA IV-S TC machines at that time, other than tape. The futuristic possibilities available with tape allowed us to build a machine so superior in quality to anything else, that today, some 10 years after its conception, it is still unequalled by the competition.

Very quickly the DAT format, although designed as a consumer format, and despite its flaws, became a favourite amongst professionals. Not because of any superior quality but principally because it was lightweight, cheap and offered a digital medium which could easily be read in practically any studio anywhere in the world. As the DAT format shows signs of its demise in the portable marketplace, a window has opened to introduce a truly professional alternative other than MD, another consumer format being pushed into the professional arena by some manufacturers.

Today NAGRA has answered the sound engineers dreams and fulfilled the rumours of 10 years ago. The NAGRA-V has been developed as an acquisition recorder designed to fill a gap in the on-the-shoulder market built with truly professional characteristics and simultaneously the advantages that modern technology can offer. The principle design characteristics of the NAGRA-V were based on the fundamental idea that the machine must entirely replace the NAGRA IV series of analog reel-to-reel recorders. The NAGRA-V offers a true 24 bit dynamic range, full time code and an audio path of the usual NAGRA quality. Equally it boasts a low-cost storage medium which does not require being copied to some other format for post production.

The (2.2GBytes) 5 inch hard disk of the NAGRA-V will give more than two hours of 24 bit stereo recording for less than 25 dollars, and therefore like tape can be archived economically. Without listing all the technical specifications of the machine here, it goes without saying that it meets the requirements of today’s sound recordists. Designed for the documentary, film and TV commercial/video recording markets it is lightweight, reliable and easy to use. It maintains the robust performances legendary with NAGRA. Features such as confidence playback, pre-recording buffer and full pull-up and down sampling frequencies meet the requirements of the most stringent professionals. The most attractive feature of the NAGRA-V is its price tag, which is affordable even when “Fully loaded” yet maintains the Swiss craftsmanship and precision of all NAGRA products.

The choice of two channels (rather than 4 or more) was made based on the principal potential market for this machine. It is not aimed to replace the NAGRA-DII, but rather to replace the IV-S as a small compact lightweight alternative. Increasing the number of channels has considerable effects on many aspects of such a recorder. Principally on the power consumption which in turn affects the overall weight due to the additional batteries needed. Secondly the physical space required for all the XLR connectors. In addition, generally speaking, two channels are quite enough for documentary and TV work. More channels are nice to have - certainly in feature-film applications. However, experience has already shown us that the audio production/post production domain is not ready for more than two channels at this time, and in many cases the external mixer used on-location is set to mix from 4/6 inputs down to two channels anyway.

Unlike other formats available today, the format of the NAGRA-V is directly compatible with computer-based workstations allowing rapid download of the audio material for post production. Being a standard “BWF” data format, the disk can be inserted into an outboard drive connected to any PC or MAC based system and transferred in a fraction of real time. In fact, due to the immediate access time of the disk there is no need to copy the data at all any more.

First shown fully operational at the NAB in Las Vegas in April and then at the AES in Amsterdam in early May, the potential of this latest marvel is tremendous, and the interest from customers extremely encouraging. The official introduction of this recorder is planned for the fall to coincide with the IBC in Amsterdam and the AES in New York.
Radio Omrop Fryslân in Holland was the first public radio station to take delivery of the NAGRA ARES-P hand-held recorders back in April 2000. One year later NAGRA NEWS caught up with Sybren Terpstra, a journalist from Omrop Fryslân and asked some questions about his experiences with the newest NAGRA.

NN: How do you use, and what type of recordings do you make with the ARES-P?

Friesland is a province in the North of Holland and has its own language. In Friesland we speak Dutch and the Frisian language. At our radio station we mostly use the Frisian language. There are about 600,000 inhabitants, a lot of lakes, we do a lot of ice-skating, the country is of course very flat and the climate is as wet as in Britain. There are almost no tulips, a lot of windmills and we do not wear wooden shoes!

It is a province with its own identity. The capital is called Leeuwarden, which is where Omrop Fryslân has its studio.

With over 150,000 listeners every day, Omrop Fryslân is the radio station that has the biggest audience in the province. With that, this regional broadcasting company exceeds the popularity of, for instance, national pop station Radio 3 and the other commercial music stations. The success of FM 88.6 has everything to do with its identification. Listeners show a keen interest in the programs about «big» and «small» events taking place nearby and they feel an affinity for the local language. The same success story applies to regional television. With daily ratings of 93,000 viewers, Omrop Fryslân TV is a popular television company, which has become one of the key players in the world of the Frisian media.

I work with about 15 colleagues on the news desk, and we cover all types of news for our province and all the news that has anything to do with our province. Sometimes we go abroad to make items, or to the national parliament in The Hague, but in general they are regional items. Most of my colleagues work with the little NAGRA, a few use the big one (ARES-C with the ISDN CODEC in it) and there are a few who refuse to make the step to the modern times. They are still working with the old, heavy NAGRA and the ½" tapes. One day the time will come when they will change too!

Besides news programs our station has background programs. These are made using the big recorder (ARES-C). They make longer items and use the larger capacity PCMCIA cards. Most of my colleagues are very satisfied and don't want to go back to the old times.

What draw-backs are there with using the ARES-P - if any?

Basically none except that we lost our status as reporters. Nobody sees us any more when we come in. Before everybody would notice us because of the big old NAGRA on your shoulder, now they cannot see that we are reporters. On the other hand, a lot of our colleagues are jealous when they see the material we work with. The little recorder is very handy for the short items we make. I would also like to have something that makes it possible to load power in the car, and also some sort of little speaker, which we miss very much. In the past I would listen to my recordings in the car while driving back to the radio station using the internal speaker of the NAGRA but wearing headphones is not really possible.

What do you like about the ARES-P most of all?

Well, it has been about three months since I started working with the little Nagra and our experiences are good. It is so small and lightweight it is just fantastic. The old Nagras (4.2) were so heavy. Now, I just put it in my pocket. I use the microphone fixed on the end and it works really well. We have run into some problems of wind noise in very windy conditions, which can be a bit troublesome, but the whole package is so compact.

How do you find the machine from a user friendly point of view?

You only have one or two buttons to press so it couldn't be easier. More importantly it is more reliable than MD because you do not need to specially save your work. If you forget with MD you can loose everything. I like the machine a lot but I do have a problem to know if it is recording in bright sunshine, as I cannot see if the REC led is alight, and as I never wear headphones I am sometimes a bit concerned. I just have to rely on the machine to be in record correctly.

What do you think of the format?

We only use the small cards in the ARES-P and this gives me 21 minutes of recording time. This is far more than enough as I only make 2 or 3 items at a time and each is only a couple of minutes long. The absolute maximum time for an item would be 5 minutes. Then I return to the radio station and take my card out and download directly into our DALET editing station from one of the big NAGRA. This works very well for me. Once the items are inside the DALET system I erase the card and start again.
Leading UK film sound mixer, Ivan Sharrock, has recently recorded the new Martin Scorcese feature, "Gangs of New York", in Rome. A long time Nagra-D user, having bought his first in 1993, Ivan is using the Nagra-D's advanced facilities to deliver the particular style of dialog recording beloved of the famous director.

"Martin Scorcese loves original «live» sound and likes to have a lot of overlapping dialog," explains Ivan. "There are a great many interrupted conversations and «over-talking» from rival factions in the Gangs which means that nearly everything is «wired-for-sound» using Audio 2020 wireless systems and split tracks; which is where the 4-track Nagra-D gives the best possible chance to change an individual actor's level in post production. I couldn't give the coverage demanded by the director in any better way and still give the soundtrack my creative input, without the flexibility that the Nagra-D allows."

"I'm running six Audio UHF radios into a Soundcraft 8:4 mixer, with additional outputs feeding Video Assist and a Sennheiser evolution 500 series transmitter feeding seven receivers for the director, script supervisor, DP, dialog coach, camera operator, first assistant and producer. There is an additional transmitter for the dialog coach to allow him to listen in on a particular actor. A third Comtek transmitter feeds loop induction playback, as we have many scenes where musicians are in shot, so whilst their instruments are muted, they are able to mime to playback off of a Denon Minidisc player."

Set in the mid 1800s and based on true stories of the various gangs that controlled the New York waterfront at that time, with the interaction of the corrupt city fathers, the film stars Leonardo DiCaprio, Daniel Day Lewis, Matt Damon, Cameron Diaz and Liam Neeson. Shooting, which began in September, mainly takes place using the huge studios at Cinecitta, and the extensive acreage of the back lot where Fellini made many of his films. "I have worked here many times," continues Ivan, "ever since The Last Emperor in 1987; most recently on U-571 where Stage 5 housed the 120 ft submarine interiors. For this film there is a five storey 1840's mission hall."

Ivan is about to purchase his second Nagra-D, a Nagra-DII, with the latest high performance 24-bit AD/DA converters and on-board 96kHz recording capability: "I have been hiring additional machines for the last eight years and it makes good business sense to purchase the latest technology. My original machine will be upgraded and primarily used for transfer work."

Ivan Sharrock (left) and Matt Damon (right) on the set of "Gangs of New York"
In September 1998, the Seattle Symphony moved into Benaroya Hall, its newly constructed concert venue. Shortly after, I reported (Nagra News No. 17, January, 1999) some of the interesting architectural and acoustic details, closing by saying that I looked forward to using the space for recording. I gave the article a title every recording engineer could relate to: “Heaven, Hell, and Purgatory” (The Agony and the Ecstasy being already taken). So, half way through the third season, how are we doing? Which of Dante’s rings are we closest to?

Then and now

Everyone loves a beautiful baby, and, during its first two years, Benaroya Hall got its share of accolades. But it is possible to be a Wunderkind only so long; eventually, it is necessary to grow up. As it has matured, the sparkling sheen of full-of-hope newness has given way to a richer patina of experience; what, now that we are much more aware of both the strengths and the inevitable quirks and challenges, of the hall and its recordability?

In fact, Benaroya has turned out to be, acoustically, an extremely good venue for recording. I’ll say more about the technical specifics in a moment, but I must say up front that one major challenge has nothing to do with acoustics, audio technology or recording techniques: Making commercial recordings is a complex issue in all cases, and even more so when done under the aegis of a not-for-profit symphony orchestra. Such an organization has a complicated existence that sometimes—but not always—relies on technology to pursue its goals, and high-end audio projects are only sometimes (certainly not always) high on the institution’s priority list. We have had several recording sessions in the last two years, but not nearly as many as I had expected. And out of these, a few vanity albums have emerged, but there have been no major commercial releases, although some are ready to go, pending negotiations.

This does not mean, however, that we have not been busy, and I can report to you what we have learned.

As discussed in the earlier Nagra News article, Benaroya Hall was designed to be, essentially, a classic “shoebox” auditorium, although with a few modifications. As such, it was the design goal of acoustical consultant Dr. Cyril Harris to emulate the acoustical properties of such celebrated orchestra venues as Boston’s Symphony Hall, Amsterdam’s Concertgebouw, and Vienna’s Grosser Musikverein. The design was complicated by the fact that the construction site is directly over a major rail line.

How did we do? The design goals were met beautifully, and, because of the building-within-a-building construction, outside noise has not been a problem. (Of course, though the auditorium is shock-mounted through the use of rubber bearings, isolation is never absolute. Seattle is situated in a seismically active area, which the hall’s design took into account. The city recently sustained a magnitude 6.8 earthquake, causing widespread property damage, but, luckily, no serious injuries. In spite of quite violent shaking, Benaroya fared quite well, with only minor cosmetic problems. When the temblor struck, a rehearsal was in progress on the stage. The musicians’ accounts describe a rolling, wave-like action. “La Mer” was not actually on the program.)

A building learns, and so do we

It is a truism that a building’s designers cannot possibly envision and plan for every use it will be put to. Needs evolve, for social, economic, and organizational reasons, but also because the venue demonstrates impossible-to-anticipate abilities to enhance or fight these desired changes. We may not be recording as much as I had envisaged, but Benaroya Hall has turned out to be a spectacularly successful concert venue, so much so that a major complaint now is lack of available dates. (One person associated with the
fund raising told me, facetiously, I’m sure, “if we had known how popular the building would become, we would have built two of them!”) The hall’s desirability was further enhanced by the completion, in June 2000, of the Watjen Concert Organ, a five division mechanical action instrument built by the C.B. Fisk Company of Gloucester, Massachusetts.

(It is interesting to note that audiences also have to learn. Of course–forget remembering to turn off cell phones and pagers–given Benaroya’s acoustic clarity, it was inevitable that audience members would have to learn to stifle their natural tendencies to cough and wheeze, unwrap candy, and make other noises offensive many rows away. And it is another of those impossible-to-anticipate quirks of history that “concert rage” should rear its ugly head at this time; many concert venues–and we’re talking about classical music, not rock concerts–have had to call in police to settle disputes over uncivilized behavior, usually related to disruptive noise-making. Fortunately, Seattle audiences are relatively well mannered–so far.)

The audio
To this point, the Symphony’s major use of audio (not including sound reinforcement) has been to support its broadcast series. (Many outside users also utilize the hall’s audio facilities for their own needs.) In this regard, it is worth mentioning the arsenal available to me as the recording engineer and the techniques I employ. The hall’s permanent installation includes eight Schoeps CCM series microphones, four 2H omnis and four 41 hypercardioids for spotting. In addition, other microphones can be incorporated for specific purposes. These feed Benchmark preamps (for session work, these can be bypassed in favor of the preferred “preamp of the month”). The signals are then routed to the studio and then digitized by dTechnologies AD 122 converters and fed to the recording devices.

About these latter components, a few comments are in order. It is tempting to record directly into a workstation, and, indeed, we often do just that. However, there are some cautionary notes. In the first place, recording high bit rate audio puts considerable demands on storage, and it is a rare facility that can keep several concerts, each with two or more performances, online at any given time. Secondly, and even more crucially, there are two classes of workstation users: those whose systems have crashed, and those whose systems have not crashed… yet. Once burned, the engineer (should he or she survive that inevitable and very painful conflagration) will employ at least a live tape backup technique. Why live? It is highly desirable both to save transfer time and to guarantee that the concert (or session) can be reproduced, regardless of the fickleness of the disk demons. And why tape? Tape not only stores prodigious amounts of audio data which can be kept almost as readily available as had it been online (besides costing a fraction as much as disks on a per-gigabyte basis), but it does so with a high degree of reliability and retrievability. Let’s say a workstation’s hard disk fails. That’s it–all of its contents are lost. If a tape becomes horribly maimed, all that is lost is that damaged spot. The rest of the tape is easily recoverable. Lastly, workstations do not travel well outside the studio, unlike a high quality tape recorder, like the Nagra-D.

My own technique has been to use the workstation (in this case, the Pyramix Virtual Studio, designed by former Nagra engineer Claude Cellier) as a digital mixer, recording both to the workstation and to a Nagra-D. In addition, the conductor receives a DAT for reference, and occasionally CD-Rs are needed as well. All of these copies are made simultaneously.

Incidentally, the Nagra-D is equipped with 24/96 converters. These I find to be extremely high quality, and I do not hesitate to use them should the need arise, and the need indeed does arise quite regularly, both in and out of the studio.

Where we go from here
Given my personal and professional proclivities, I would naturally like to see more emphasis on high-end recording. There are numerous projects I can envision, especially given the availability of a large high quality organ in the facility. However, as previously noted, the decision to pursue such undertakings is more complicated than analyzing its technical and even musical merits.

I’m confident that such projects will happen. In the meantime, it appears that we are on the road, at least, to audio’s celestial regions. Benaroya Hall is proving to be a very special place to make music. As such, it has become a very special place for me to work.
Below, I have written, in a general diary overview, what took place at the shows and along the way of a European concert tour in January 2001. This project could never have happened without the musicians, technicians (Till Erb and Blaise Grandjean) and support of Nagra. So I am thankful that I was provided this opportunity to produce «The Art of 3» jazz trio featuring Ron Carter (double bass), Kenny Barron (piano) and me, Billy Cobham (drums).

The whole objective of this exercise required me to produce a stereo recording on my old Nagra IV-S which needed a good “look see” by the “magicians of Cheseaux” before I would try to make that move. Through Richard Straub, a friend and manager of Media Crypt, I found a connection to those who specialize in ultra-high-end stereo sound reproduction at Nagra. A meeting was arranged for me to discuss my idea of producing a series of live stereo recordings using my IV-S tape recorder. While speaking with Örjan Ericson, director of marketing for Nagra Audio, on the telephone he was quite interested in my concept and shared with me Nagra’s interest in seeing its product gain greater marketing visibility and a broader marketing access in all areas of sound reproduction. I thought that from an analog recording perspective this would be a very unique opportunity for me to develop a product that I would be a part of in performance as well as in production. This would be something special and very unique based around the logistical ingredients used to create it. That was until I entered the meeting with Örjan Ericson, John Owens and Blaise Grandjean at Nagra. Once everyone had an opportunity to digest what I had in mind things really started to happen fast. The next thing I knew, I was on my way to recording four concerts in four days on two Nagra DIIIs synchronized together to make 8 tracks of incomparable sound quality. John Owens described in “Layman” terms the difference in recording quality between the IV-S and the DII and got me so excited about working with the DIIIs that I never thought twice about my more basic concept of working with my IV-S. I think it was a good move...

On the road
Rome to Naples by bus was the way to go. We made it in about 2 hours and 30 minutes. So far everything has run very smoothly with extremely minor problems exposed and dealt with accordingly and swiftly. Blaise and Till are in conference on how to make this project become a reality via the DIIIs that we have obtained. Coordination between “house sound” engineer and “sound recording” engineer sets a very sensitive balance in terms of personalities and interpretation of the two required platforms for this performance presentation. Meanwhile, Kenny and Ron are busy trying to adjust to the temporary surroundings.

Rehearsal was held in the Teatro Tenda in Portici. As it turned out, the interest in the concert is so great, according to the promoter, that the venue had to be changed to accommodate the expanded audience. I am told that they are expecting 2500 people for the show tomorrow. We will need everyone in so that they can absorb the high frequencies inherent in such a place not to mention the fact that it is cold in there. They do have a blower fan but it is loud and we are making a recording tomorrow night so we can’t have heat generated by that. We have gone through and prepared twelve compositions. During the rehearsal the performance as a trio began to grow quickly since we have some background in past performances to draw from, although minimal. Ron and I have not performed together since 1987 and performing with Kenny in a full performance or even a jam session for more than one tune is hard to recall within the last twenty plus years. Of course, this is not something that can happen anytime we would like it to since we all have very well defined performance concepts and platforms that take us in directions that are highly personalized and tuned to each of us. So I think, this makes our musical collaboration even more attractive.

Technical support of Till Erb has been strong and consistent as usual with Clara Salina working closely with me on the travel related matters: we have a good team with a minimum amount of confusion.
The material that we have chosen to play makes me focus upon the overall performance level of the band with the bass as my main focal point. I want to be complimentary from a position of understating what need to be said by me through the drums in the performance. Brushes and lighter drum sticks are the focus as I try to avoid playing too softly in my quest to blend in properly with the band and music. I have chosen a Vic Firth A55a drum stick to work with here along with a lighter set of brushes (purple). Also I have chosen some beckons and very soft tym-pani mallets as alternative instruments to help enhance my musical concepts. The ability to listen and translate what is heard in this context is all-important.

Recording with the Nagra DIIIs should be a good place to work from in the development of the live recording of the trio. The Nagra-D experience of Blaise Grandjean, recording engineer of Studio Paudèze II, Switzerland, could signal the beginning of a very fruitful and positive relationship between Bill Cobham Inc. and Nagra. I am very optimistic about this. Blaise works well, so far with us and is and has been very resourceful. The Nagra is a very special tape recorder and to have the chance to work with two 4-channel machines in the creation of this recording project is a positive step in the further development of my production company and supports my concepts and ideas.

Jan 11, 2001: The Naples Performance

Sound check went smoothly except for the presentation of my composition which I profoundly screwed up by not providing a lead sheet that would allow Ron and Kenny the freedom to float in the way that I would have liked them to. Because of this factor, I scrapped the idea of playing “As First I Saw You” on this show but plan to play it on the next show, in Oslo. Selection of material was pretty much what it could only be... Actually, Ron had prepared four compositions in the simplest, most direct fashion by having lead sheets for his stuff. The tunes were pretty straightforward therefore easy to interpret. In this format where musicians with drawing power are brought together to perform, the key is to get the rehearsals in as effectively as possible so that a minimum amount of energy is spent sorting out how to get from point ‘a’ to point ‘z’ without losing all of the positive elements that the collaboration has brought to the performance table.

The performance was fine for being the first one. Ron’s approach to playing the time was the focus for me in that he is one of the few musicians whom I have experienced could manipulate where and how the tempo and beat will be treated within a composition. In order to be in sync with this concept, one must not only listen but also feel the time as and how it is treated in performance. Depending upon the composition, treatment could be more crucial in certain areas of the music than in others. Some tempos were a little tricky to control as a unit because of the lack of playing time and experience between us (we hadn’t performed as a trio together in about 30 years). But things started at a very high level and only got better with time in comparing notes and being patient regarding our performance.

For “the first time out of the shoot” this performance set the stage for where we were slated to go with the music. I remember when speaking with Ron and Kenny, there was an obvious question as to what we should play musically. It was then decided to wait and see where we were when next we met to perform. Kenny was coming in from a long way south of the equator for this project and Ron from New York to meet me and my team in Rome. During rehearsal the following day we tried to focus upon establishment of how we approached playing the time. This is one of the platforms for developing a musical assessment of the trio. This is the reason I call this series «The art Of 3».

I checked with Blaise and there were a couple of odd bits with the ambiance recording tapes (done on a Tascam D-60) but generally, everything went off without a hitch.

Jan 12, 2001: The Oslo Performance

After the show, at about 4.00 a.m., we all piled into the bus that brought us from Rome and traveled back to the airport so that we could make a 8.00 a.m. plane to Oslo, Norway via Munich.

The concert today provided proof of our concern for making this short period that we were to perform together as musically productive as we could. There was even greater concern on everyone’s part to play the notes that made the most sense and presented the strongest musical pre-
sentation possible. Because of this, we had what
I believe to be the most successful of the four per-
formances so, most of this night will appear on
the recording which will be entitled «Here We
Come». It is projected to be released in the spring
of 2002.

We played in a small concert hall that attracted
about 800 people whose range in age was fasci-
nating to me. I found that we were performing to
people between the ages of 15 and 65. In my
experiences, performing jazz in Scandinavia, I
have observed changes in the way that the pub-
lic views this musical format. I was very happy to
experience what appears to be a genuine
renewed interest in the music there. I feel that
being part of this special musical presentation
also went a long way towards cementing the
bond between the young people who are just
getting to know where the music has it’s origins
and how it reflects the elements that are a mirror
of their local influences. In a way, performing a
show of mostly «standards» worked to our bene-
fit since the main attraction of this configuration
had to do with our group interpretation of the
material. Transferring that to tape was para-
mount. Here we were pretty successful.

Jan 13, 2001: The Odense Performance
This was probably the easiest travel day of the
day as we did not have to go very far and the
transport problems were pretty “straight forward”
and minimal. We flew from Oslo to Copenhagen
at a reasonable hour in the morning.

The concert was very interesting to observe from
the drummer’s chair in that I can’t recall ever
having witnessed young people being so heavily
immersed and focused in the music when we
were performing. The audience appeared to
absorb every note as if we were reciting poetry. It
was a very good sign for me and added to my
optimistic foundation regarding the direction of
this musical format for the future. People tended
to really be in tune to the way that we related
through all of the senses at our command
in order to make a solid musical state-
ment. Unfortunately, the only way to
learn this, I think is to experience it and
decipher it for you.

Playing as a working unit and being able
to analyze in real time, what is happening
is a very valuable gift not often bestowed
on the performer. I am happy to have
received this gift as representation of time
and experience invested and accrued
during my career.

Jan 14, 2001: The La Spezia Performance
The day was long and became very stress-
ful when we arrived from Copenhagen in
Milan, Malpensa and had trouble (as
usual) receiving our luggage in Baggage
Claim.

After making some logistical adjustments
(checking in at the local hotel, etc.) we
headed out to the city of La Spezia, about
an hour’s drive south of Genoa. We were
very fortunate that we were not caught in
fog, especially at this time of year, since the north
of Italy is famous for this. This was to be our last
performance in this pilot project of mine and in
looking back on the recent experiences, I have
no doubt that we can do very well with perfor-
mances of the music as the concept is clearly a
viable one.

I am hopeful that we will have a greater opportu-
nity to perform together, maybe in about 12 to 18
months, if we can plan it properly. The attraction
for me is to document the performances and
include some written or sonic analysis of what
has transpired. This library will be a living salute
to those that took part in this project and add
support and interest in the development of the
‘art form’ in years to come.

We got a great review that night and everything
went pretty smoothly in getting back to the hotel
as well as getting everyone back home the next
day. It was almost as if we never played four gigs
in Europe at the beginning of the year 2001... But
we did!

▲ Recording engineer
Blaise Grandjean at work
Live Recording Techniques
by Blaise Grandjean

Nowadays, the vast majority of concerts use amplification. Realistically, it is only possible to find true acoustic performance in classical music. Even jazz, played with traditional instruments such as double bass, drums and piano, uses an amplification system. There are also stage monitors, speakers for each musician, in order to let them hear what they are actually playing.

In such situations it is impossible to make a natural sounding recording using two microphones. Engineers use spot microphones for all instruments. There are two solutions: either recording on a multitrack machine or making a live mix on a stereo recorder. The first solution is the best but it requires a multitrack machine and a post production process. For a stereo recording, the engineer needs an isolated room, consequent equipment and also a long set-up to achieve good sound.

Billy Cobham’s initial project was to make a stereo recording directly on his NAGRA IV-S. The tour he was planning included four performances all over Europe, in front of large audiences, implying a PA system. It appeared to us that a stereo recording would not be suitable for this situation. We suggested that he use two NAGRA-DIIs to achieve an eight-track recording of high quality. This solution offered a lot of advantages:

- The NAGRA-DII has top quality microphone preamplifiers and A/D D/A converters, so no need for extra pieces of equipment.
- Professional multitracks are often large and heavy whereas the NAGRA-DII is portable.
- The NAGRA-DII is a field recorder, so when moving it from place to place you can rely on it, the machine will always work flawlessly.
- Even though it is a portable machine, there are no compromises in sound quality.
- The 24 bits offer a large dynamic range that can render the great nuances of live performances, really relevant in a music that includes a lot of improvisation.

These points immediately convinced Billy Cobham. On the tour, technical conditions were not always great: bad wiring, strange mains power supply, no technicians on the spot, but still the NAGRA-DIIs gave their best, as usual.

A Quick Report from Toronto
by Thomas Hidderley

I have just wrapped “Nero Wolfe” a series of six 2-hour movies for the A&E television network starring Timothy Hutton. The Nagra-D performed flawlessly throughout the nearly six month schedule. This included many night exteriors working at -25°C.

Earlier in the summer, both the post and location machines were fitted with new rotary heads in Switzerland before starting the Mariah Carey feature “All That Glitters” and have now accumulated some 300 hours of use.

I have been using the D for all my projects since 1998 and find the machine a delight to use. Any problems encountered have been swiftly solved by support from either Nashville or Cheseaux.

“No Wolfe” set with Timothy Hutton ➤
"NAGRA IV-SJ is a revolutionary method for the purpose of instrumentation in our German automobile industry. Its accuracy, its reliability and autonomy in the field are unsurpassed!"

These words came from a chief engineer of DAIMLER BENZ in the early seventies, when we introduced the famous Nagra IV-SJ to the German market.

Due to the great slogan of environmental conservation which started at that time, it was the right moment to offer such a machine, which came up to the expectations of a new industry, called UMWELTSCHUTZ. During the late eighties we have lost the main part of the market to cheaper and uncomplicated instrumentation units which are based on DAT recorders in connection with PCs or laptops. But we are experiencing the same phenomena as in other industries, i.e. film sound recording: people love the simple way of handling a DAT cassette and its recorder, but again and again they swear about the system’s unreliability (susceptible to humidity, dust, heat, shocks, etc.). It is a good thing that NAGRAVISION S.A. decided to re-enter the instrumentation field with a proven machine. In this case with the famous 4-track self-contained digital tape recorder Nagra D/D-II, which is just showing its reliability in the field of film sound recording and music production.

And in the meantime one of our best customers concerning instrumentation units (until to-day he was working with 5 Nagra III, 14 Nagra IV-SJ, and 2 Nagra TI) is using 5 (five!) Nagra D/D-II.

It is superfluous to say that they are absolutely satisfied with this new technology though the modulometers do not meet the requirements of a calibrated instrument. During the next month they will start their measuring sessions again, and we will interview Mr. DeVeer (of the institute BAST) to listen to his experiences with this relatively new recording equipment.

Look forward to the next issue of NAGRA NEWS where you can read the interview!

Joachim Weber
Managing Director
Nagra Kudelski GmbH, Munich

As the Kudelski company celebrates its 50th anniversary, the NAGRA III which is still being used the world over is celebrating its 44th birthday! Quite a remarkable feat for a piece of electronic equipment. We wonder how many devices purchased in 2001 will still be in daily operation in the year 2045?

The pictures below show Mr. Emmanuel Clemente using his “ever trusted NAGRA III” during the filming of a recent TV commercial in the Philippines. This particular model POH 66 8620 was a pilot machine manufactured in 1966 some 35 years ago!

Thank you, Mr. Clemente for the photographs, and for your continued trust in our equipment!
NAGRA: when I hear this name I can’t help thinking of the magic words “asa nisi masa” in the film 8½ by Fellini. This is probably the word that the Fates utter when conjuring up castles for children who deserve them.

And we really are dealing with castles here, when we look at them in the dark, illuminated only by the light from the 845’s and the VU meters. I cannot deny that I have a real passion for certain objects that I believe combine form with excellent technology.

Over the years I have had the good fortune to possess some of them - for example, the Nikon F-photomic from “Blowup”, the Hasselblad SWC, David Gammon’s Hydraulic Transcriptor record player, Charles Eams’ lounge-chair/foot-stool, Richard Sapper’s “Tizio” table lamp, and many others. Of course we are not talking about a collection, but about objects that I’ve been using a long time and with great pleasure. These objects have enhanced my life and the energy and beauty with which they are endowed, are such that I’m often tired of calling them objects; in reality, they have a life of their own and as time has passed they have become essential presences, friends.

A little while ago, these friends were joined by the beautiful PL-P and VPA monoliths by Nagra, their beauty being matched only by their sound quality, and it will need some time before I get used to these two new items without stopping to look at them every time I walk by them and without being driven to set them in action. They have transformed the silence of these nights into a life filled with extraordinary events, into live music.

Obviously, each of us has his own idea about the reproduction of a musical happening, and we each try to give it substance through ever more refined instruments. I am greatly interested in listening to music that sounds like a live performance, especially from the emotional angle, and the NAGRA’s have now become an essential means of pursuing that goal.

For this discovery I have to thank first and foremost my friend Giorgio, who was the first, as a musician, to apprehend this tendency instinctively - which later became a common affinity between us. Listening to his music centre, I understood for the first time the potential of these refined valve sets that stand at the head of the medium-top section of two extraordinary Mbl 111b s1’s, wrongly considered by audiophiles in “tights” as stone boxes. I don’t consider myself to be a practising audiophile, I rarely read the specialist magazines, especially the Italian ones, but I love music.

My PL-P s/n 5500634 preamplifier receives the signal from a Koetsu pick-up, The Signature, installed on an Atlantis pneumatic arm - another absolutely special object - while the VPAs drive two new-generation Klipschorn-Birch’s, which are located in another room.

I believe that the special qualities of the PL-P are, apart from its manageability, really rare in this sector and, in my opinion very useful in a preamplifier of this type, a great adaptability to different types of use, through a combination calibration system which is very rational and simple to use. As for the VPAs, I would like to quote a famous phrase by F. L. WRIGHT : “give me the luxuries of life and I will willingly do without the necessities”.

I would finally like to thank the Magic Dwarf Di Prinzio, for having more than once given me knowledgeable support impossible in any other context, and Engineer Fratello for his precious advice.

Ciro Coatiti was born in Bari in 1952. He graduated in architecture in 1978, the year since which he has pursued his profession as an architect without interruption, producing numerous works, particularly in Pescara, as well as in other Italian cities. In 1991 he was selected from among the 20 finalists of the “A. Palladio International Prize for Architecture”, being awarded the “Special Mention by the Jury” and the opportunity to take part in an important exhibition in the Basilica Palladiana (catalogue published by Electa). In 1993, he won the “City of Thiene International Prize for Architecture” for his residential complex in an area in the historical centre of the city.

He has taken part in many architecture competitions, including the “Kansai-Kan of the Diet of Japan Library” project and has published a number of projects in journals and books in Italy and abroad.
**Reminder**

When we last spoke, we tried to determine whether an acoustic system working at 96 kHz was better, or simply different from one operating at 48 kHz.

The subjective experience showed definitively that a difference existed, but we were unable to conclude that the sound on the speakers of the first system was better qualitatively than on those of the second.

An experience studied in the frequency domain showed that above 20 kHz the loudspeaker, or more precisely the tweeter, creates intermodulation. The speaker is therefore no longer a realistic transducer but more an interpreter of the sound; the phenomena of intermodulation modifies the contents of the audio message and therefore diminishes the fidelity of the system.

**In the temporal domain**

We could have left our demonstration there, but we were in the mood to examine some other experiments.

In the same way as the eye has difficulties in discerning two points placed close to one another, in the order of a thousandth of a radian, the ear has a discriminating limit with respect to time. The idea for this new experience came to us when recalling a visit to an ear specialist. This university hospital practitioner was looking to digitize a clinical procedure usually performed in the analog domain. This test consisted of making a patient listen to two brief impulses separated in time, by a duration voluntarily adjusted by the operator.

According to this doctor, digital systems currently in use (in the middle of the ‘80s) were unable to go beyond 48 kHz sampling frequency, whence it seemed that the separation ability of our ears could reach 20 microseconds. At the time A/D and D/A converters only operated up to speeds of 48 kHz and without oversampling, we were unable to satisfy the practitioner.

Remembering this, it seems evident that the direction of the temporal domain merits a little more exploration, and the answer could be the justification for recording at 96 kHz rather than 48 kHz.

**First experience**

The operation was made simple. An ad-hoc signal generator was used to generate two brief pulses and to separate them by a variable duration. In our case, the duration of the impulse was 15 microseconds, and the separation delay could be adjusted from coincidence up to 20 milliseconds. The repetition speed is set to about half a second, which experimentally speaking seemed optimal in order to evaluate the time discrimination of the ear.

The first operation to come to mind is simple: it is sufficient to amplify this double impulsion by means of an amplifier sufficiently rapid to attack a tweeter normally used in quality speakers.

The listening was done by placing the auditor at a distance of about 1.5m from the tweeter, with one ear facing the source.

The distance of 1.5m is a compromise: closer, we would find ourselves in a situation of near-field (pressure/speed balance not established), further, and bearing in mind the dimensions of our listening room, we could be disturbed by reflections from the walls.

We can thus describe the results of this manipulation: 20 milliseconds to 5 milliseconds, the ear can disassociate the two impulsions perfectly. Below 5 milliseconds there is confusion; the signal appears to be a single impulse. Around 20 microseconds, (measured between the two rising edges of the impulses A and B) (Fig. 3) an unexpected phenomena appeared: the sound became muffled. This phenomena becomes more apparent if we increase the level of excitement of the tweeter.
At this point in the tests, it seems that we could show the advantages which we could have gained from a system capable of sound restitution with a temporal precision better than 20 microseconds, which is the limit for a system operating at sampling frequency of 48 kHz.

Second experiment
In order to be assured that this phenomena was not a side effect of our amplifier, we modified the experiment by injecting the impulses A and B to independent amplifiers and the outputs of the amplifiers both attack the same tweeter.

The results of the tests with this new set-up led us to the same conclusion: to be able to discriminate two pulses up to 5 milliseconds and modification of the nature of the sound once we drop below the 20 microseconds barrier.

Third experiment
The conclusion could have seemed final, but while re-reading our notes on the measurements made in the harmonic domain, it occurred to us that, perhaps, the speaker could have provoked this phenomena. A new manipulation was thought up, which consisted in only using one pulse, amplified by a single amplifier, attacking two speakers side by side.

It was therefore possible to create two delayed pulses by simply moving the position of one of the speakers, 7.5mm corresponding to 20 microseconds delay.

Below 50mm of the relative position of the tweeters, the difference in the level of the two pulses heard at a distance of 1.5 m should not trouble the experiment.

As soon as it was set up, it was tested and our suppositions were confirmed: the tweeter was the source of the phenomena.

In this last experiment the progressive modification of the relative positions of the tweeters from 50mm to 0mm made no difference to the sound of the pulses.

It is once again in the non-linearity of the materials used to build the tweeter where the explanation of phenomena observed in the first and second experiments lies.

Placing a measurement (B+K) microphone in the place of the auditor, we can clearly see the phenomena which appears when approaching the coincidence of the pulses in the first two experiments (Figure 6A, delay is 120 microsec. approx.; Figure 6B, delay is 50 microsec. approx.). However, we do not see it in the third.

Thanks to the non-linearity of the tweeter, figures 6 A/B show that during T2 appears low frequencies not present in the pulses. It is this trail which makes the “clap” sound muffled.

By integrating and performing an FFT (Fast Fourier Transformation) on the signal, which represents the impulse response (we should say double impulse response) we should obtain a correlation with the observations noticed in the frequency domain as explained in the previous article (NAGRA NEWS #19).

Conclusion
Remember that the prosaic aim of these experiments was to demonstrate that it is preferable, to obtain an optimal acoustic quality, to record our works at 96 kHz sampling frequency rather than 48 kHz. However, the experiences described above, show that the only thing we managed to do is to bring to light the faults in the weakest elements in the listening chain, in this case the loudspeaker. It seems therefore, that we should wait for an improvement in the transducers in order to benefit fully from the performances of a recording system operating at 96 kHz. As an addition to this conclusion I invite you to re-read the article «96 kHz Recording, a door to the future» which we published in NAGRA NEWS #14 (Dec.1996)
2001 Events

MAY

The 110th AES Convention held from May 12-15 at the RAI International Exhibition & Congress Centre in Amsterdam. Booth No. H25
Organizer: Nagravision SA Cheseaux/Switzerland

JUNE

The 7th Asia-Pacific Sound, Film & Video Exhibition and Conference, BroadcastAsia2001 held from June 19-22 at Singapore Expo, Singapore. Booth No. 2K1-15
Organizer: Nagravision SA Cheseaux/Switzerland

SEPTEMBER

IBC 2001 International Broadcasting Convention held from September 14-18 at the RAI International Exhibition & Congress Centre in Amsterdam. Booth No. 9.431
Organizer: Nagravision SA Cheseaux/Switzerland

Top Audio & Video, taking place from September 13-17 at Quark Hotel in Milan.
Organizer: SAP Strumenti Acustici di Precisione, Salemo/Italy

High-end 2001, from September 21-24 at Seedamm Plaza in Pfäffikon (Switzerland).
Organizer: Nagravision SA Cheseaux/Switzerland

The 111th AES Convention held from September 21-24 at the Javits Convention Center, New York City.
Organizer: Nagra USA, Inc. Nashville/USA

Tokyo International Hi-Fi Audio Show from September 28-30 at Tokyo International Forum.
Organizer: Taiyo International, Inc. Tokyo/Japan

NOVEMBER

The 26th SBES Sound Broadcast Exhibition Show, from November 14-15 in Metropole Hotel, National Exhibition Centre, Birmingham.
Organizer: Nagra Kudelski (GB) Ltd. St. Albans/England