Gerhard's electronic music: a pioneer in constant evolution

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ABSTRACT

Roberto Gerhard was a pioneer of electronic music. His experimentation in this medium was thanks to his friends Joaquim Homs and Ricard Gomis and to the technical support of the BBC Radiophonic Workshop. He made substantial developments in his electronic music in the final stages of his life, producing a significant number of pieces in only ten years. He composed electronic music for several media, such as theatre, television and film, and sometimes he used the same music for different works. For instance *DNA in Reflection*, a piece originally for film appeared also as part of a collection of concert pieces on tape, it was then split into segments for an American record label and finally it was used in some episodes of the BBC series, *Doctor Who*. Thanks to the fragments of tape that still exist we can perceive the preparation of the electronic works and it is possible to understand the value of theses pieces and study the techniques used to create them. Interestingly Gerhard's acoustic and electronic music developed in a very similar way during the last ten years of his life. Analysing his last orchestral piece, the *Symphony no. 4*, and comparing it to his electronic music, we can find a number of similarities in structure, texture and rhythm.

1. THE BEGINNING

Gerhard had been an electronic composer since the early 1950s, at least since 1954, when he composed the incidental music for a play by Bridget Boland, *The Prisoner*. The work was for chamber ensemble and tape and was probably the first electronic music played on stage in Britain.

The 1950s was the decade of the rise of electronic music. Among others, in 1951-2 Pierre Boulez composed the *Deux Études* and in 1953-4 Karlheinz Stockhausen composed *Studie I* and *Studie II*. Stockhausen and Boulez, however, were in their twenties, whereas Gerhard was 58 years old in 1954. He was facing a new medium and a new world of sonority in the later stages of his life, something that Dick Mills, a technician at BBC claims in Briscoe's book:

> Roberto had a rather difficult problem to overcome when attempting to record his basic sounds, as he lived on a busy trunk road in Cambridgeshire and the only quiet period was around 3.30 in the morning. One can imagine the scene as Roberto twanged and banged and bonked metallic objects as his wife Poldi acted as recording engineer. Both of them were in their sixties at the time. [1]

This versatility was part of Gerhard's remarkable auditory capacity. Nothing concerning sound was alien to him if it had order, or in some way intrinsic organization. In fact, the new medium was just one more step in Gerhard's approach to sound. He viewed music as sound-organization, therefore with the development of electronics he had a wider palette of sounds to work with. According to Laurence Picken, eminent ethnomusicologist, Cambridge scholar and Gerhard's friend, the aural capacity of the composer was impressive. Picken was surprised at his ability to analyze music in a style that he had never heard before. According to Picken:

> The immediate recognition of absolute pitch-values, of non-just intonation, of irregular (aksak) rhythms; the discrimination of instruments in ensemble; the detection of components at the limits of the audible range; the identification of formal procedures — all these things one might have expected from any trained listener. What was unexpected was the intensity of response; the degree of participation evinced; the visible signs of emotional possession by this alien music. [2]

2. THE BBC RADIOPHONIC WORKSHOP

For Gerhard, his contact with the BBC Radiophonic Workshop, newly created as a response to the new opportunities that electronics provided for music, was vital in this period. It opened on 1 April, 1958; the technicians working in Room 13 at Maida Vale (Radiophonic Workshop headquarters) included, among others, Daphne Oram (who resigned in January 1959, after 15 years with the BBC, to follow a career as a composer), Delia Derbyshire (who joined the BBC in 1960 and collaborated with Gerhard on his 1965 Prix Italia winning *Anger of Achilles*), Dick Mills (who supported live performances of Gerhard's work at the Royal Albert Hall and also the Royal Festival Hall) and Desmond Briscoe, who was appointed permanent manager of the Radiophonic Workshop [3].

In fact, no composer outside the BBC had greater access to these workshops and, most importantly, to the studios where the BBC undertook radio productions, than Gerhard. This access, probably granted due to William Glock's admiration for Gerhard, allowed him to work in his home studio and in the BBC Studio with great flexibility. As Peter Manning says:

> The 'closed door' policy of the BBC Radiophonic Workshop, and the continuing lack of support from other quarters, severely retarded developments in Britain during the 1960s. Indeed, Roberto Gerhard was the only established composer from the broader community to be granted reasonable access to the BBC facilities during the decade. This permitted him to produce a number of pieces, primarily for radio, working both at the BBC and at his own private studio in Cambridge. [4]

But the BBC Radiophonic Workshop was not the only technical assistance which Gerhard received, his friends Ricard Gomis and Joaquim Homs had tape recorders as well, and they exchanged information, including tapes with recordings of their own pieces and sounds from their own works [5]. In one letter from Gerhard to Homs, Gerhard asked for some recordings, because he needed very specific sounds from typical Spanish instruments for his *Symphony no.3, 'Collages',* which apparently were unavailable in the percussion department at the BBC.

> [C]ould you make me a piece of tape, recording the sound of two pairs of castanets. One pair recorded as high as possible and the other one as low as possible. I need these two sounds for the symphony, as elements of a structure of wood percussion on 12 sound tracks. [6]

Thanks to the BBC contacts, even the popular series *Doctor Who* had excerpts from Gerhard's music. The music used in this series comes from a film, *DNA in Reflection,* produced in 1963 by the Cambridge Laboratory of Molecular Biology (in fact, produced by two research students, Hans Boye and Anand Sarabhai). Gerhard turned this work into an independent concert piece, entitled *Audiomobile 2 DNA*. Ten short extracts from this score were also released on a non-commercial record by a library of recorded music, with the titles, *Asyndeton, Bubblecade, Campanology, Dripsonic, Meteoroids, Speculum, Stridor, Suspension, Telergic, Uncle Ned* [7].

In 1987, Julian Knott released a limited edition of 300 tapes, *Space Adventures - Music from Doctor Who,* with three pieces used in Doctor Who. In 1998, Knott released the same collection in a double CD [8]. According to the episode guide from BBC, the music used in *Doctor Who* is in Figure 1. In two examples that survive from Gerhard's contribution to *Doctor Who* it is remarkable that his music is not used as a background, in fact, the music is used as a sound effect and tends to not be reflecting emotions but is used as an intrinsic part of the action.

Title	Length	Episode	Broadcast date - time
Asyndeton	0:29	The Space Museum, 1 The Moonbase, 1 & 3	24 April, 1965. 17:40 11, 25 February, 1967. 17:50
Telergic	0:46	The Tomb of the Cybermen 4	23 September, 1967. 17:50
Meteoroids	1:26	The Time Meddler, 4	24, July, 1965. 17:40

Figure 1. The music used in *Doctor Who*

The history of this particular piece, *DNA in Reflection*, reflects the difficulties and pressures in Gerhard's life. Some of the sonorities used are similar to Stockhausen's *Gesang der Jünglinge,* but unlike Stockhausen, Gerhard only uses electronic sounds. The structure of Gerhard's piece, as with the rest of his works in the 1960s, is a single polymorphic movement, which produces a huge variety of textures. This particular structure allowed Gerhard to split the piece into ten different blocks. The result was a successful recording for the label 'Southern Library of Recorded Music'. As discussed, the BBC used this recording for some episodes of *Doctor Who*, and it is likely that Gerhard received more royalties from these short music excerpts than from the piece in its complete format.

Although Gerhard benefitted financially from the music, the coherence of the piece was lost, and also the identity of the music. In fact, the piece is diluted when the different blocks appear in different micro-pieces. This does not seem to have occurred in Stockhausen's music, which meant that he was able to maintain a serious artistic status in all his music, whatever the quality. The fact that Gerhard was working in the dramatic media (film, television and theatre), was in some ways problematical, as his works were not considered high art. Even if the final result was interesting, musical, poetic or revolutionary, he was working for commercial commissions and his reputation was not considered at the same level as other composers working in absolute music. However, after recovering the electronic music of Gerhard it is evident that it is not only his acoustic music which deserves a place in the canon but also his electronic music as examples of revolutionary experimental works.

3. THE EVOLUTION

The evolution of Gerhard's electronic music from the first recordings up to the final productions is very clear not only from the musical point of view: we can also hear a progression in terms of the amount of possibilities that the technique (and the knowledge of the technique) supply to the sound. The recordings were made initially in his home studio, and then processed in room number 13, Maida Vale. Gerhard's studio was very modest, little more than some tape recorders and one microphone, but with that basic amount of equipment in his hands, he created some memorable music. A letter he sent to the British Council, asking for some help in order to get electronic material, is illuminating:

> I've always been working with a shoe-string equipment in electronics. It comprises: one microphone, five tape recorders, a track mixer of five channels, and that is all. I've never used oscillators or white noise generators. I'm allergic to sine tone. When I needed certain types of white noise, the BBC Radiophonic Workshop has kindly provided lengths of tape. I would have been happy to have been able to install envelope control. I could not afford it. But I have been able to develop some measure of envelope modification by a manual means. I have no visual or audio monitoring. I wish I could have had some modulators. No automatic switching devices. On occasion their absence has been very trying. [9]

The lack of technical equipment may have been very trying for Gerhard but it was probably because of this that he developed his idiosyncratic way of working. Any sound could be a source for his music, it did not seem to matter what he had to do with it, 'twanged and banged and bonked' as Dick Mills says, or throwing objects down the stairs, as the filmmaker Lindsay Anderson said:

> I remember visiting Roberto in Cambridge, talking about the score, and even assisting him in throwing various objects down the stairs, in an effort to product the right kind of abstract sounds, which he felt he needed. [10]

The recording of the music was a crucial moment for Gerhard, and he had a very clear idea of the sound that he needed in order to use it for his electronic music. In some tapes from the Gerhard Archive in the CUL, there are recordings with this process, and it is remarkable how accurate his method was of creating the sound he was seeking. In some recordings he and Poldi, playing piano and accordion created atmospheric sounds. In the recordings, Gerhard gives very clear instructions of how the sound must be produced and even where to put the hands on the instrument.

It is interesting to see the feedback from the critics about Gerhard's electronic music. Something as new as electronic music was obviously alien for non-expert ears, including critics used to acoustic sonorities and it is perhaps not surprising that the first critics were very severe, as in the case of the score for chamber ensemble and tape, made for the 1955 Stratford production of *King Lear*. This work was very controversial because the combination of electronics and theatre was a new concept for the audience, and the critics disapproved of the production. However, this generated a state of interest in the public and the theatres were full, as Gerhard commented in a letter to Homs:

> King Lear has had very bad reviews and the critics castigated us, especially the designer and me. But the result has been to produce a sensational atmosphere. All London wanted to come and see what is going on; therefore, everything is sold out for the season. [11]

Criticisms for other works were even worse since the new medium was not understood at all, as in the case of his *Symphony no.3, 'Collages'*, premiered in the Royal Festival Hall. The Glasgow Herald, 13th February, 1961:

> At this performance the noises only very occasionally seemed to add anything worthwhile to the music. For the most part they were felt to be rather annoying intrusion on what the orchestra was saying, and once the novelty had worn off, the ear tended to ignore them as far as possible, just as it would any other continuous sound that was not a product of the music.

However, the influential critic, William Mann, wrote that Gerhard's music was proving the worth of the new media.

> High standards had been set, right at the start, by Roberto Gerhard's *Audiomobile 2 DNA,* a film score already well known: heard by itself the second section is too short, but it is supremely musical and totally idiosyncratic, sustaining hope that electronic music is a possibility, if not yet wholly proven fact. [12]

4. EXPLORING THE RELATIONSHIP OF ACOUSTIC-ELECTRONIC

There is an evident correspondence between Gerhard's acoustic and electronic music. And what is more important, his orchestral music became more "electronic-like" the more he experimented with electronics. In his articles and talks, he captured the key points of electronic music philosophy:

> Nothing that instruments or the orchestra can do as well or better can be justified in the electronic medium. To be justified, both the sound-stuff and the way it is organized must be original growths of the medium. [13]

The *Symphony no.4* represents the pinnacle of Gerhard's orchestral writing, offering highly original textures combined with a broad dynamic range and an exciting use of rhythm. In terms of acoustic sonority, the *Symphony no.4* is composed to emulate electronic music while using acoustic instruments. This is why this particular piece is perfect to highlight the relationship between acoustic and electronic. Indeed in the 1960s many composers were writing acoustic music with electronic-like results, as was the case with Stockhausen, Maderna and Berio (whose *Sinfonia,*

along with Gerhard's *Symphony no.4* was commissioned by the New York Philharmonic Orchestra for its 125th anniversary).

There are three points to consider in order to explain this relationship: percussion, palindromes and textures.

Percussion is one of the fundamental elements used to create an electronic sonority. The *Symphony no. 4* opens with an electronic-like percussion chord, something that Gerhard often used at the start of his pieces in his last five years (see Figure 2). In Benoliel's words, '[M]assive trenchant tone-clusters related to the composer's electro-acoustic compositions open the symphony' [14]. This electronic-like sound comes from the use of the whole chromatic and the large range of the chord, in a particular orchestration. In bar 1 all the percussion instruments except xylophone and marimba (which play a cluster in medium and high range) are marked, 'let ring'. In fact the electronic work to which Benoliel is referring is the beginning of *DNA in Reflection.*

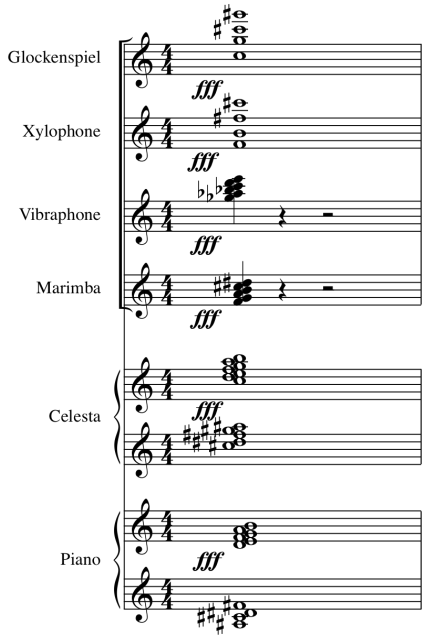

Figure 2. Gerhard, *Symphony no.4*, b. 1 (Percussion, celesta and piano).

Gerhard was a great experimenter with percussion in general. Percussionist James Blades referred to the works of Gerhard five times in his manual, *Percussion Instruments and their History*, all of them illustrating the composer's meticulousness in orchestration.

> Given a well-rosined bow and a cymbal of moderate thickness, a resounding screech can be produced by drawing the bow over the edge of the cymbal. Roberto Gerhard employs the sound in his Concert for 8 (1962) (In an earlier score he had written for a comb to be drawn over the edge of the cymbal). [15]

The first technique described by Blades above is used in the *Symphony no. 4*, where four cymbals play simultaneously (Figure 3).

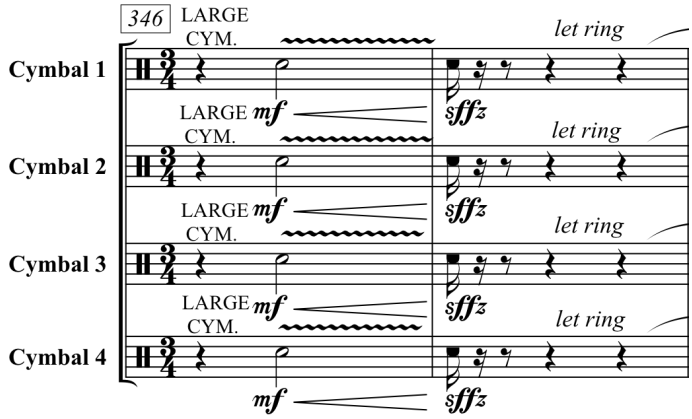

Figure 3a

The result provides a feeling of white noise, similar to the textures in *Caligula* and in *Asyndeton* (one of the ten excerpts of *DNA in reflection*). The preface to the score of the *Symphony no.4* includes the following:

> The screw-rods to be used on the suspended cymbals are provided with the hire material. For the *crescendo-sforzando* effect, start drawing the rod quietly across the edge of the cymbal, at a small gradient to the surface; then quickly increase the gradient and finish with a swift stroke and considerable pressure. [16]

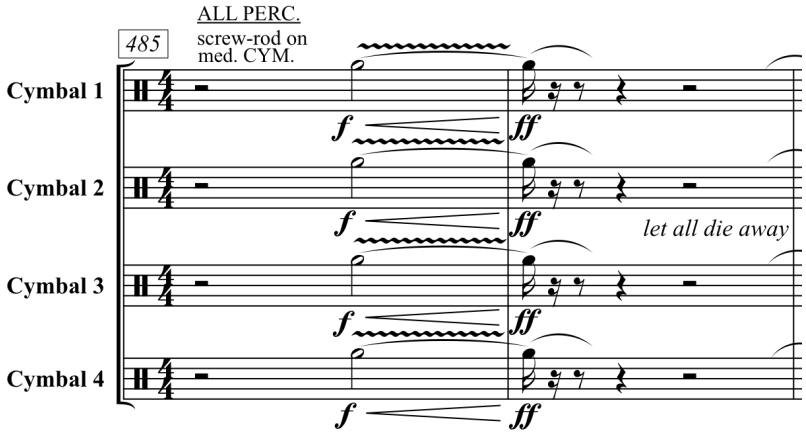

Figure 3b

Timpani also have an important role in the Symphony; the pedal is used often, with roll. This technique evokes sounds from previous electronic works by Gerhard. The fast glissandi in the timpani are very similar to the sine-waves used in some of his other work. The two examples of timpani glissandi (bb. 487-494, and 636-641) given below can be compared with an audio excerpt from *Telergic* (See Figure 4). Also, we can find timpani in some on the electronic works, because Gerhard did not process the sound of this instrument (For instance in *Pericles* or in *Meteoroids*).

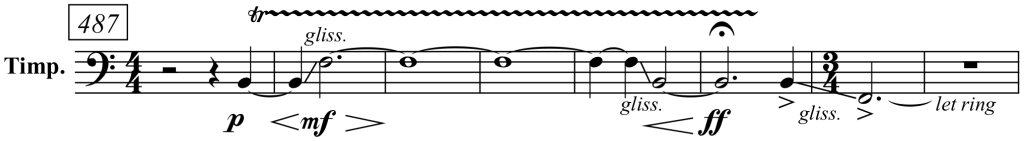

Figure 4a

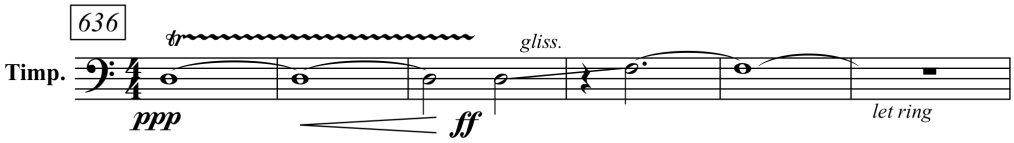

Figure 4b

Another technique is found in the four percussion sections in the Symphony. Following different descending serial combinations, the percussion produces a background for various string and wind gestures. All the instruments play continual but different rhythmic loops, which produces a mechanical feeling (See Figure 5). Here are very similar textures in electronic works, in the middle of *Vox Humana*, and in *DNA in reflection*.

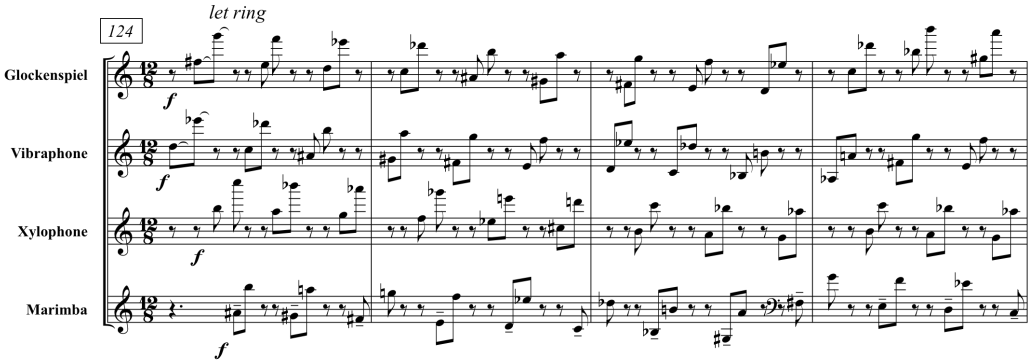

Figure 5

Sometimes, strings are used as percussion instruments. At b. 854, a *divisi*-string texture begins (see Figure 6). There are twelve lines in total, offering six different ways of playing *col legno*: on open strings, on the chin-rest, on the tail-piece, etc. The viola (upper part) is the only part that eschews *col legno* altogether. A set of rhythmic *ostinati* ensue: Violin II (upper part), for instance, in quintuplets, plays a repeated unit of two quavers, followed by five quavers' rest; Viola (lower part) plays another unit of quaver followed by a dotted quaver rest; the bottom doubles basses play a unit of a pair of quavers followed by five quavers' rest. This complex rhythmic pattern aids in the creation of a very unusual sound, closer to tape-sounds than to a traditional string ensemble.

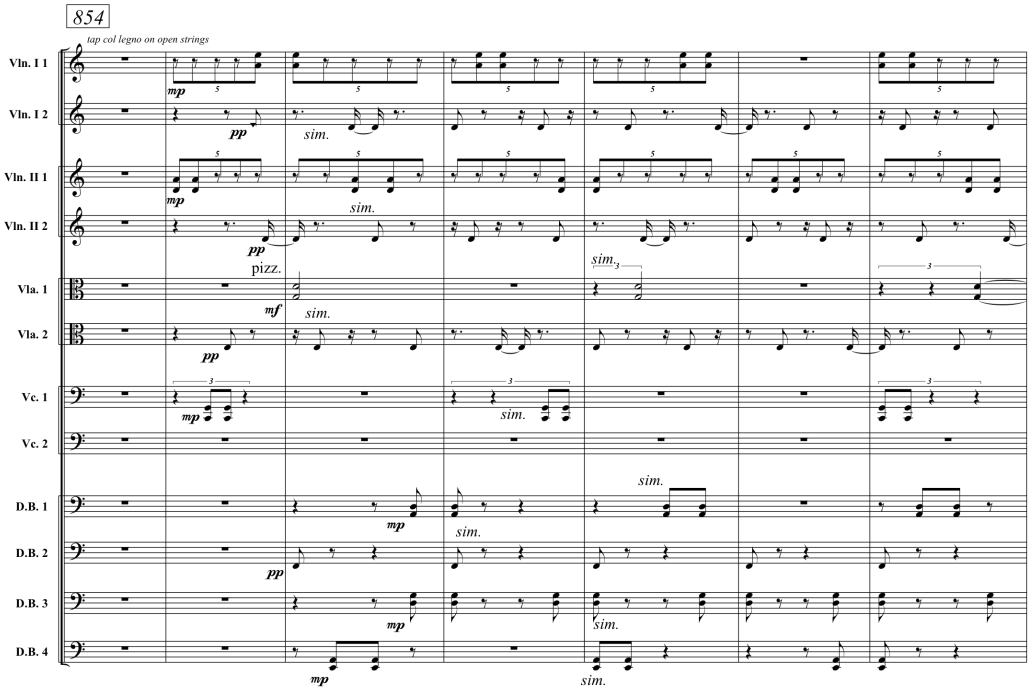

Figure 6

Figure 7 shows the combination of *col legno* with *pizzicato*; in bb. 70-72, *col legno* in Vlns I and II, Vla and Vc is combined with a particular technique in double basses, where the latter are instructed to stop all four strings with the flat of the hand and slowly gliss. upwards to the limit of the strings, while tapping *col legno* on any two neighbouring strings ad lib. at the same time. There are similar textures in electronic music, in *DNA in reflection* at 1:40 and at 2:46.

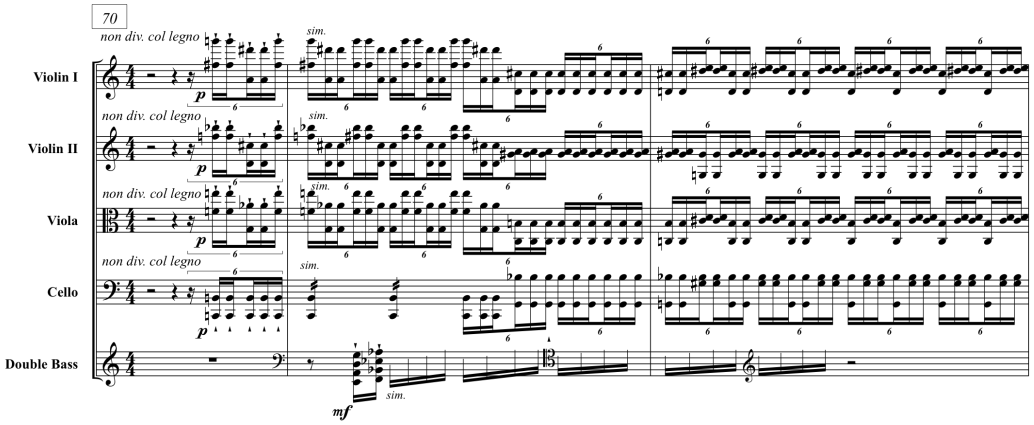

Figure 7

In the *Symphony no.4*, rhythm is subjected to careful organization. In this organization there are rhythmical palindromes. Such palindromes, usually written for winds, create thematic movement over a contrasting background (usually percussion) or they may appear in combination with other palindromes, creating a more dense texture. In bb. 118-123 (Fig. 8), different voices (Obs 1-4, 3-2, 2-1; and Bns. 1-3) combine to create the palindrome consisting of the rhythm shown in the figure. In *Vox Humana* and *DNA in Reflection*, there are examples where the sound is the same backward and forward.

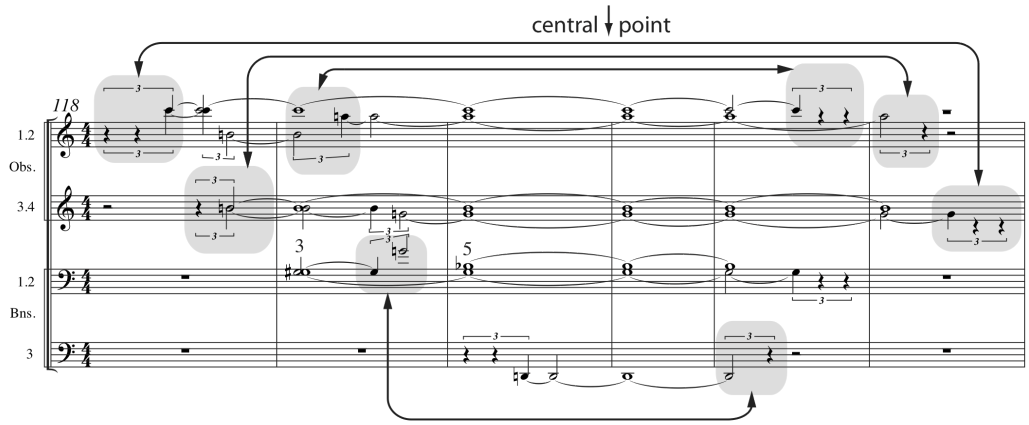

Figure 8

There are many textural similarities between Gerhard's acoustic and electronic music, but two are particularly common. One technique applied to both strings and winds is for an instrument to initiate a fast melody which is then overlapped by other instruments that reproduce it with variations. In fact it is a texture with a melodic foreground moving fast with an up and down movement.

Figure 9 presents the first occurrence of this technique, on four clarinets, in the *Symphony no.4*. In *Pericles,* we have an example of this texture with a very similar "melodic line" movement. There is a static background while the melodic line moves fast in the foreground.

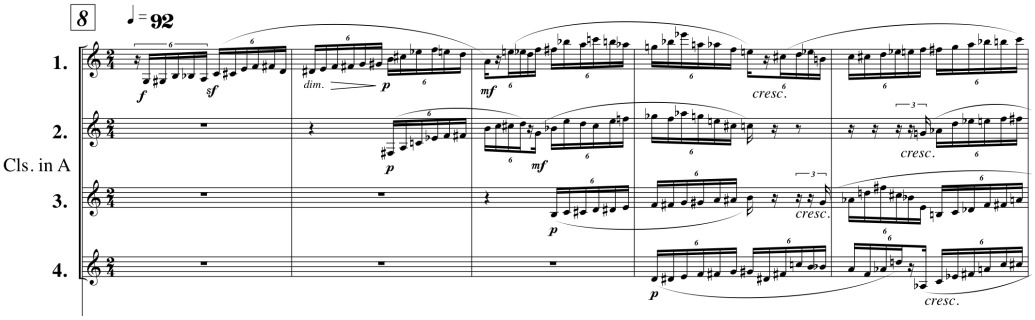

Figure 9

The other textures are called structural chords. These are chords played in brass, that punctuate the Symphony. They articulate the transition from one texture to another, cadential moments at the end of sections, for instance in bb. 14-15 (Figure 10). They are always marked ***ff*** or ***sffz***, a large brass group (15 musicians) generating a wall of sound, playing ***ff*** and staccato.

In Gerhard's electronic music, there are structural sounds, used to separate textures and for articulate transitions, for instance the beginning of *DNA in Reflection,* or some parts of *Vox Humana*.

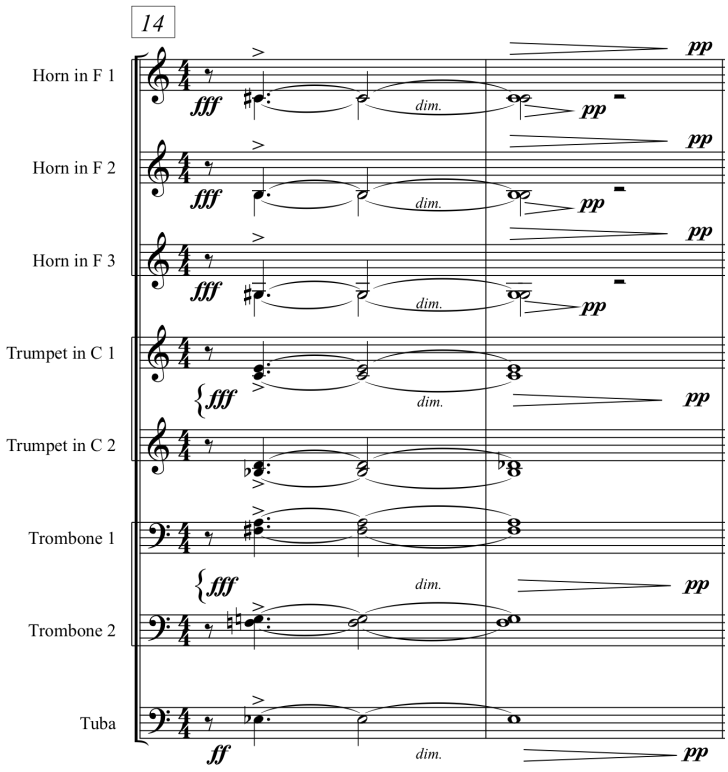

Figure 10

5. CONCLUSION

There is a very close relationship between Gerhard's acoustic and electronic music in terms of structure and texture. It could be argued that Gerhard's versatility in composing in different media meant that on one level he was able to have a career as a professional composer without relying on teaching positions, but this also resulted in his electronic works especially not being considered as part of the avant-garde. The re-discovery of his electronic works and his experiments on tape are allowing us now to re-assess his contribution to the development of electronic music in the UK, a contribution with a different perspective from that of the rest of Europe at that time. It is also providing us with a basis to further investigate the acoustic works.

6. REFERENCES

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[3] Information taken from BRISCOE, D., and R. CURTIS-BRAMWELL. 1983. *The BBC Radiophonic Workshop, The First 25 Years*, London, BBC

[4] MANNING, P. 2004. *Electronic and Computer Music*, Oxford University Press, New York, p. 14.

[5] Ricard Gomis (1910-1993). Engineer and expert in sound recording techniques. had a close friendship with Gerhard, and helped him at various stages of his life. Information from conversation between Carlos Duque and Pietat Homs Barcelona, 31 October, 2009.

[6] Letter from Gerhard to Homs, June 27th, 1959, Homs family collection, Barcelona, uncatalogued. [*'Me podries fer un troc de cinta magnetofónica enregistrant el so de dos parells de ´castañuelas. L´un el mes agut possible i l´altre el més baix possible. Necessito aquests dos sons per a la sinfonia, com a elements d´una estructura de percussió de fustes sonores a 12 pistes'*] Translated from the original Catalan by Carlos Duque.

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[11] Letter from Gerhard to Joaquim Homs, September 9th, 1955, Homs family collection, Barcelona, uncatalogued. [*'El ¨King Lear¨ ha tingut una prensa negra, ens han arrencat la pell a tires, sobretot al decorador i a mi. Pero el resultat ha estat crear un clima de sensació: tot Londres ha volgut anar a veure de qué es tractava i, consequentment, la taquilla va quedar tancada ja durant la primera setmana, no queda cap entrada fins al final de la temporada'*] Translated from the original Catalan by Carlos Duque.
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