

Electro-acoustic sound quality in instrumental music: *Amplify 1* by Franco Oppo

Antonio Marongiu

Conservatorio di Musica “Luigi Canepa”, Sassari

Franco Oppo (1935–2016) is a singular figure in the field of Italian music of the late twentieth century; as composer, teacher and innovator of teaching composition, he combined theoretical research in the field of musical analysis and the study of Sardinian folk music. His commitment was extended to all sectors of musical life: he was promoter and organiser of concerts and musical activities, trade unionist and administrator of Cagliari’s Istituzione dei concerti e del teatro lirico “Giovanni Pierluigi da Palestrina”.¹

During the 1950s the introduction of principles of indeterminacy or chance in musical work, with substantially different initial settings between European musicians and their American counterparts, had a profound impact on compositional thought and practice, opening up to the planning of works in which the sound materials or the formal structure itself are not strictly fixed by the composer.² Oppo’s works from 1962 until the mid-1970s resort to aleatoric processes for which the area of indeterminacy concerns the parametric articulations of the sound while the formal design is rigorously defined; Oppo himself places these procedures in the context of the experiences of controlled randomness, as opposed to the use of absolute randomness, and links this methodological choice

to the certainty of the sound results obtained.³

The mid-1970s marks an important transition for Oppo's compositional activity and theoretical reflection. Between 1975 and 1976 he composed *Musica per chitarra e quartetto d'archi* (April–May 1975), *Rondeau* for two bowed string instruments (July 1975),⁴ and *Praxodia* for soprano, bass and eight instruments (1976); three years later *Praxodia 2* followed, a stage version of the previous one. In those same years the theoretical reflection in the compositional and analytical field led him to the formulation of a general theory of musical language based on a semiotic approach.⁵ In his letter to Michela Mollia on 2 June 1978 in preparation for the *Autobiografia della musica contemporanea*, on the score of *Praxodia* and the *Musica per chitarra e quartetto d'archi* he writes:

[...] I consider important and significant, in my last production, this new way of setting the score: it is the continuation and expansion of the problem (control and rationalisation of randomness) of the *Rondeau*.⁶

In these works the use of combinatorial and statistical procedures, applied in different ways and in varying degrees to sound parameters and to micro and macro-forms, allows Oppo to control randomness, as every possible event is statistically predicted; the goal is to bring the compositional technique back into the rational field and avoid the empiricism of random procedures.⁷ The scores undergo a radical transformation, appear in an unconventional graphic form, and assume a descriptive function of the compositional processes and the structure of the work; they maintain the prescriptive function towards the performers, but they lose the recognition function of the synchronicity of the events.⁸

Amplify 1 for two amplified bowed string instruments (dated 4 April 1976) is a work from the same period but of different conception and approach. It is a work of timbre research in the domain of complex sound further extended to lower intensity emissions with the use of amplification. In *Amplify 1* the timbre is the structuring parameter. The score is complex due to the presence of an elaborate apparatus of nonconventional notation – already partly present in previous works – but reflects a different and more traditional conception compared to Oppo's contemporary works: it presents a linear and determined succession of sound events along a one-dimensional time axis divided into seconds. There is no intent to represent the structure of the work. The aleatoric procedures are regulated and limited through mechanisms of multiple choice on predetermined materials; combinatorial procedures are mainly used in the definition and permutation of rhythmic groups, but do not seem to take on a structural role. The use of amplified sound, never used before by Oppo, testifies to the exploration of a new line of research.

A better understanding of this work and the technique used can be achieved through the consultation of the material present in Franco Oppo's personal archive (henceforth FFO), donated by his family to the Fondazione Giorgio Cini in Venice.

The materials related to *AmPLY* consist of

- a. a folder containing:
 - a.1 two double sheets with notes and diagrams;
 - a.2 two sheets; front with the types of timbres (*Tipi di suono*), back with diagrams;
 - a.3 one sheet; front with a hypothesis of macrostructure (*Episodi principali*), back with diagrams;
 - a.4 eight single-sided sheets (other use on backside) with header *Elementi da determinare graficamente* [*Items to be determined graphically*];
 - a.5 a copy of the score;
- b. a transparent envelope with *AmPLY '76 Matrice* header containing two copies of the score; the second one lacks the last two pages and presents annotations and changes in pencil and red pen;
- c. a transparent envelope with an *AmPLY copie* header containing a copy of the score with red ink annotation of the tuning used for recording the examples;⁹
- d. an ochre-coloured envelope with *AmPLY 1° Copia con numerazione riferita agli esempi di esecuzione registrati con Carlo Cabiddu e Giorgio Oppo* [*Copy with numbering referred to the examples of performance recorded with Carlo Cabiddu and Giorgio Oppo*] header, containing references to the numbers of the registered examples;
- e. three typed presentation notes:
 - e.1 with annotation *per esecuzione Madrid 30.4.81*;
 - e.2 with the date 16 October 1988;
 - e.3 without date;
- f. six pages with diagrams for the audio montage of the performance examples.

There is also the recording of the examples, an important help in identifying more precisely the resulting sound of the required techniques.

Significantly, Oppo collected the preparatory materials of *AmPLY* and the *Rondeau* in the same folder: in fact, beyond the differences in layout, they highlight several points of contact. Both compositions are written for two bowed string instruments which are not specified (even if in the *Rondeau* the previous indication *per due violini* remains on the 1st instrument part) and on the score a dedication is written *a Jo e Silvano*. They are linked to the collaboration with two violin teachers from the Conservatorio of Cagliari, Josephine Beaumont and

Silvano Minella. This is what Oppo wrote about *AmPLY* for the performance in Madrid on 30 April 1981:

The composition of AMPLY I (1976) was preceded by meticulous research (conducted together with the violinist duo Minella-Beaumont to whom it is dedicated) on the sonic possibilities of bowed string instruments. Different ways of producing sound were studied with traditional means, bow and finger (any other type of manipulation of the instruments was excluded), with particular attention to those factors that have little importance in the traditional technique of bowed string instruments: string contact point, bow position, bow friction point, left hand pressure on the string, type of bow movement, type of excitation of the string.¹⁰

The meticulous study is reflected in the two pages of preparatory material where the results of technical and timbre research conducted for *AmPLY* are listed and the different types of sound grouped into four categories are described: ‘with hair, plucked, silver winding, and particular effects [con crine, pizzicato, filettatura d’argento, effetti particolari]’ (FIGURE 1).¹¹

Con crine – but also including the use of the wood of the bow – lists twenty-two ways of producing sound. It varies the string contact point, from the fingerboard to the tailpiece, the pressure, the amount of hair, the type of movement of the bow (which includes parallel, angular, and circular bowing), the elastic reaction (*balzato*, *battuto*, *gettato*); the sound can modulate in amplitude and frequency through variations of bow speed or pressure. Further indications concern the quality of the sound produced in relation to the strings, fingering, and dynamics.

Oppo then lists eighteen types of *pizzicato*; the *pizzicato* with the right hand or with the left is inflected in a long series of variations, among which particularly important is the *pizzicato* of the left hand with the right that modulates in frequency by pressing the string between the bridge and the tailpiece (*pizz. m.s. ondulato*).

There are six types of sound with the use of silver winding where the different types of movement used with the hair are applied as well as eleven *effetti particolari*, not related to previous techniques and mainly of a percussive type, with fingers on the instrument or the strings (FIGURE 2).¹² This list was certainly drafted after the *Rondeau*, as Oppo makes a reference to the *Rondeau* in the list itself. The techniques employed and the corresponding notation are then reported in the score.

FIGURE 2. Franco Oppo, *AmPLY 1*, page from the score: notation and performing techniques, © 1976, by Edizioni Musicali EDI-PAN srl, Roma, EP 7887

Punto di sollecitazione della corda:

- sulla testiera: sulla test.
- verso la boiserie: test.
- posizione ordinaria: nessuna indicazione opp. ord.
- verso il ponticello: pont
- molto al ponticello: ↑
- sul ponticello: *
- fra cordiera e pont.: ↑

Tipo di sollecitazione:

- strofiato: a) arco ordinario: n, v
b) " spialato: n,
c) " falato: nrvrv
- pizz.: a) ord. b) alla Bartok: 9
- battuto: x (su corda, pont., riccio)
- premo-oscillato: a) verticale (con argento)
b) orizzontale (con crivo)

Per l'esecuzione sono necessari:

- due microfoni a contatto da applicare preferibilmente sulle corde tra il ponticello e la testiera.
- uno o due amplificatori adeguati alla potenza della cassa (altoparlanti)
- due o quattro casse (altoparlanti) di potenza adeguata alla grandezza della sala e alla sua acustica

Collegare i due strumenti con casse diverse rispettivamente disposti in punti lontani fra loro della sala

Pressione dell'arco sulla corda:

- minima: p1
- poca: p2
- ordinaria: p3 opp. nessuna indicazione
- molta: p4
- massima: p5

Punto di attrito dell'arco sulla corda:

- crine: a) un filo: f.
b) mezza: m.
c) tutto: t.
- legno
- filatura d'argento

I. II. III. IV = le 4 corde

Pressione della mano sinistra (palpastrella) sulle corde:

- completa: •
- mezza: +
- sfiorata (come per armonici): o
- smorzata: ✗

Movimento dell'arco sulla corda:

- perpendicolare: n v (ord.)
- orizzontale: n+
- obliquo: n+ n-
- ondulatorio: n}
- circolare: (O)
- tremolo: #

Movimento della mano sinistra sulla corda

- glissando veloce: —————
- glissando lento: —————
- nessun movimento: —————

Battuto = su arco palp. o arco.

Tipo di suono:

- uniforme: —————
- modellato in frequenza: ~~~~~ (ondoleto)
 - variando la pressione dell'arco
 - " " velocità
 - ondolando l'arco (n)}
 - premono col palp. sul punto ↑
- modellato in ampiezza: mod.
 - mod. equidistante: con le fasi + e - uguali: — — — — —
 - " " " " " con la fase + più breve: — — — — —
 - " " " " " molto più breve: — — — — —
 - " " " " " irregolari: con le fasi + e - variabili: rit#, acc., etc.

Accordatura: stabilita

elemento da ripetere più volte

elemento da ripetere più volte allungando liberamente

formula ritmiche da eseguire più volte con letture diverse (orizzontale, verticale, circolare)

1ª corda abbassata di una 10ª..... 12ª

2ª corda " " " " 2ª M..... 4ª g

3ª " " " " " " "

4ª " " " " " " 10ª..... 12ª

Le 8 corde vanno accordate con 8 suoni diversi - Evitare che fra due qualsiasi corde vvote vi sia l'intervallo di 8ª.

In another concert programme note Oppo further clarifies the structuring character of the timbre parameter in *AmPLY*:

In my music, the timbre research and the experimentation of new instrumental techniques have always had a remarkable function. In some works, however, the timbre and the new techniques assume a decidedly prominent role and in *AmPLY* they even become the only elements of musical elaboration. In fact in this work pitch variations (melodic and harmonic) have no structural relief and rhythmic scanning is limited to the indication, in seconds, of the temporal flow. The musical message is therefore all entrusted to the variability and the fluctuation of the timbres.¹³

The scope of the timbre search is not completely clear if tuning is not taken into account. *AmPLY 1* requires a particular tuning: the 1st and 4th strings must be lowered by an interval between the tenth and the twelfth, the 2nd and the 3rd strings between the second and the fourth, with the usual recommendation to avoid unison and octave.¹⁴ The score with the references to the examples contains the pen annotation of the tuning used for the recording: for the violin 1st string C₄,

2nd F#₄, 3rd B₃, 4th Eb₂; for cello 1st C#₂, 2nd Bb₂, 3rd E₂, 4th A₀.¹⁵ Thus the sound of the two instruments emerges as the purpose of the denaturing, excluding the most conventional emissions, altering the normal elastic reaction of the string by means of slack tuning.

STRUCTURE ANALYSIS

[...] You cannot write everything that comes into your head in a untidy manner: you have to select the ideas, specify them, coordinate them, discard those that are superfluous and deepen those with which you want to characterise the piece; you have to deal with the musical grammar and with the technical possibilities of the instruments; we must organise the sounds (structure them) so that the interpreter and the listener can understand the composer's intentions; it is necessary to elaborate a path, a 'story' that the listener can follow and find sensible, or at least plausible; it is necessary to make sure that the sonic images of the composer are recognisable to the listener. In short: the first phase of the composition is above all imagination and creativity, while the second is above all technique and craftsmanship.¹⁶

The *AmPLY 1* score analysis highlights a defined and localised organization of some particular timbre types. Among the preparatory materials there is also a draft structure divided into five episodes, distinguished by letters; each episode refers to the one or more types of sound that characterise it.¹⁷ The operative methodology is extremely clear: *AmPLY* is not just a work of timbre research, but the whole structure is completely articulated on the evolution of the timbre qualities. However, the scheme of the episodes here does not yet correspond to the final draft. Three episodes are certainly identifiable (A, white sound, B, plucked left hand modulated, D, silver) but arranged in a different order; one reused as complementary material in another section (C, used in D) and one not used (E, expected as the final episode) (FIGURE 3).

FIGURE 3. Franco Oppo, *Amphy 1*, draft of the structure. Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo

~~Episodi~~

Episodi principali

A. - Suoni ff > < (dinamica ~~in~~ in continua variazione) come suono bianco - pressione: molta/massima - corde: I - II/III - IV Ψ e \uparrow arco basso \uparrow, Ψ , e anche sciolto ~~in~~ ord $\rightarrow \Psi$; \uparrow variaz pos. 2.

B. - Pizz. m. s. ~~tempo~~ modulazione m. d. con pressione in \uparrow

C. - Suoni filati - battuto, bulzato, impulsi - pizz. \uparrow , P^{III} smorzato

D. - Fila ~~di~~ d'argento - e 2 - poi vl. 1 continuo argenteo
 vl. 2: ped. II ~~sub~~ intervallato con ~~gusti~~ e impulsi rari suoni
 sempre variati ~~di~~ suoni e modi anch'issima I.T. PPPP < PP variata

E. - per finire vl. 2 nota anch'issima ~~II~~ \uparrow PPPP \leftarrow Ψ variata - modulata
 in tutti i modi - intervalli rari sul vl. 1 - ~~per~~ Pizz.
 finisce con I.T. PPP. ~~sub~~ per 10"

Passaggio da $\left[\begin{array}{l} \text{f} \\ \text{vl. 1. 2} \end{array} \right.$ \rightarrow $\left[\begin{array}{l} \text{f} \\ \text{vl. 2. 1} \end{array} \right.$ subito

B C opp. C.D. $\left[\begin{array}{l} \text{f} \\ \text{vl. 2. 1} \end{array} \right.$ rit., acc., cresc. molto, tim.,

A. - Arco so 1^a corda.

Elementi!

It is therefore possible to divide *AmPLY 1* into three sections of similar duration, characterised by the prevalence of certain types of sounds, closely related to particular techniques. In the first section, from 0'00" to 3'24",¹⁸ complex sustained sounds prevail, mainly produced with bow hair, through different combinations of bow position on the string, speed and pressure.¹⁹ The central zone of the section, from 1'23", is entirely based on the amplitude modulation of these sounds, obtained through variations of the bow speed. The arrangement of the parts reveals a dense succession of imitations between the two instruments. The initially spaced distances of entries of 12" gradually tend to get closer up to 1'47", a point of maximum tension and density. The dynamic excursion in this section is the widest of the piece and goes from *pppp* to *fff*. The section ends with a decrease in density and dynamics. In his notes Oppo writes about this section: 'Sounds *ff* [...] (dynamic in continuous variation) as a white sound [Suoni *ff* [...] (dinamica in continua variazione) come suono bianco]'.²⁰

The spectrogram of sounds taken from the recording of the examples is useful for checking some analysis data of the score.²¹ The initial sound of the 1st instrument, from 0'00" to 0'12" (hair on the open string, close to the bridge), presents a saturated spectral space. It is a stable sustained but granular sound with a complex sound spectrum and corresponds to the white noise (*white sound*) description made by Oppo (FIGURES 4, 5, AND AUDIO 1).

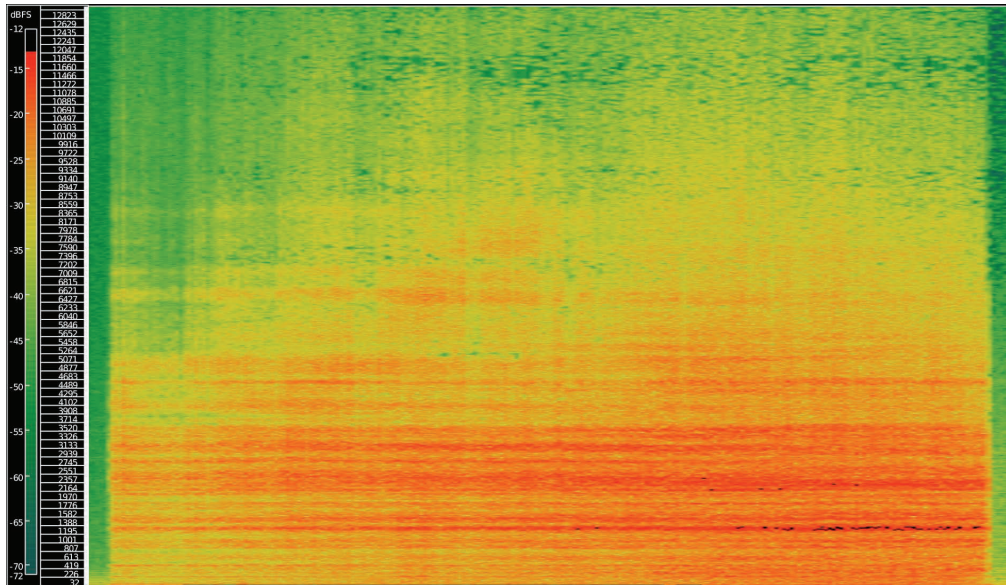
FIGURE 4. Franco Oppo, *AmPLY 1*, score, partial reproduction of p. 1, © 1976, by Edizioni Musicali EDI-PAN srl, Roma, EP 7887

The image shows a partial reproduction of the musical score for *AmPLY 1* by Franco Oppo. The score is for two amplified string instruments. It features two staves, labeled 1° and 2°. The tempo is marked as quarter note = 120. The score includes various musical notations, including notes, rests, and dynamic markings such as *pppp*, *cresc.*, *ff*, and *dim.*. A red box highlights the first 12 seconds of the first staff. The score is titled 'AmPLY 1' and 'per 2 strumenti ad arco amplificati a Io e Silvano'. It also includes performance instructions like 'arco in loco pre-molto-oscillato-orizzontale' and 'lento'.

AUDIO 1. Franco Oppo, *AmPLY 1*, recorded examples; 1st instrument from 0'00" to 0'12" = Track 1, from 0'21" to 0'33". Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo²²

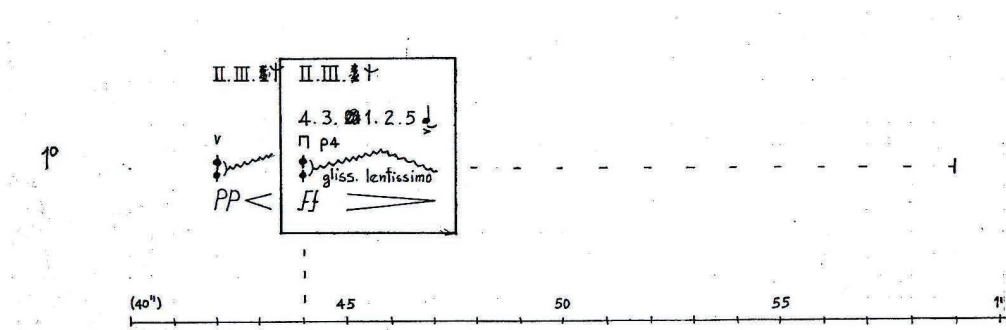


FIGURE 5. Franco Oppo, *Amply 1*, recorded examples; spectrogram of the 1st instrument from 0'00" to 0'12"



Another example of the 1st instrument, from 0'42" to 0'59" (hair on 2nd and 3rd string, slow glissato, very close to the bridge) shows an evolution of some frequencies with greater energy at the glissato; the perception is still that of a complex sound, but with a variable sound spectrum (FIGURES 6, 7, AND AUDIO 2).

FIGURE 6. Franco Oppo, *Amply 1*, score, partial reproduction of p. 1, © 1976, by Edizioni Musicali EDI-PAN srl, Roma, EP 7887



AUDIO 2. Franco Oppo, *Amply 1*, recorded examples; 1st instrument from 0'42" to 0'59" = Track 1, from 1'53" to 2'13". Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo



FIGURE 7. Franco Oppo, *AmPLY I*, recorded examples; spectrogram of the 1st instrument from 0'42" to 0'59"

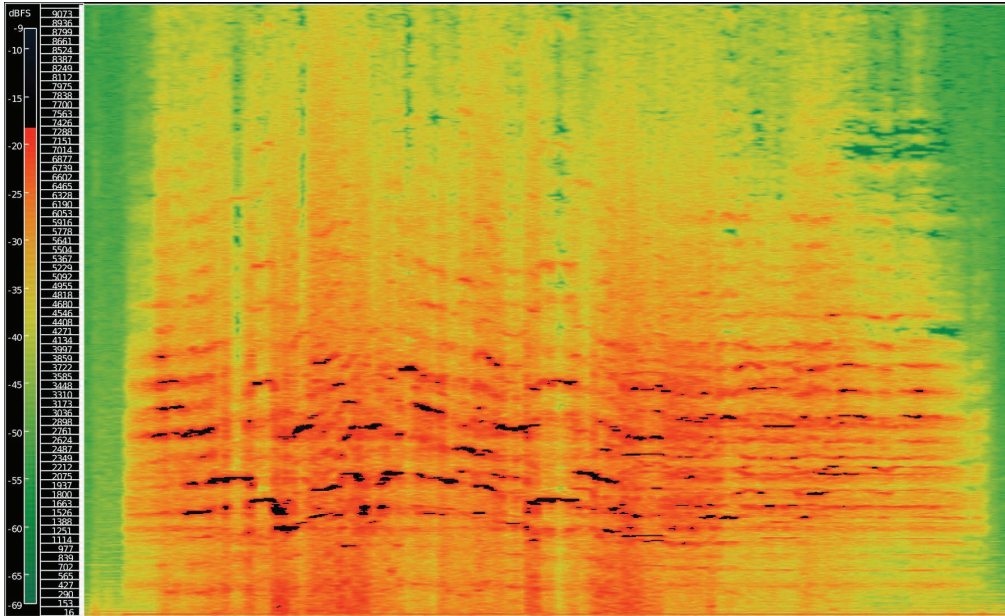
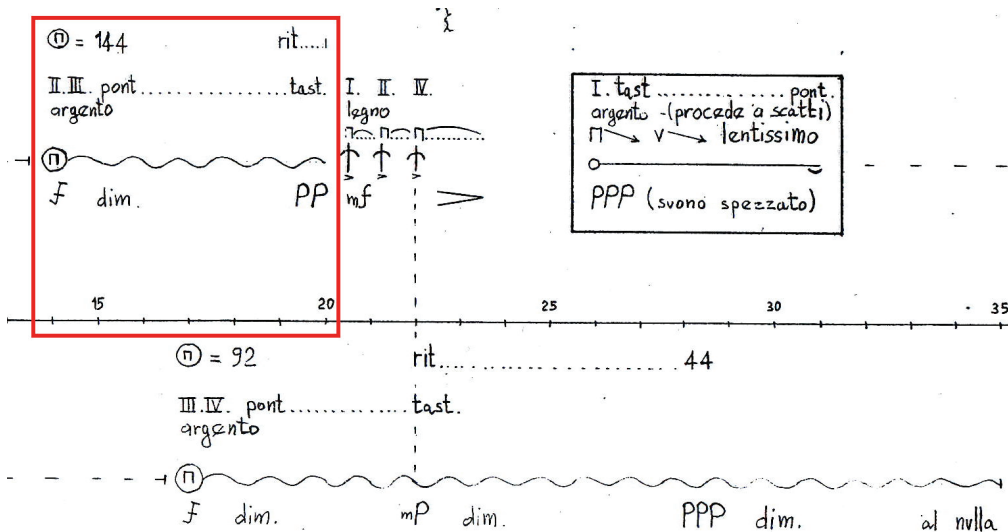


FIGURE 8. Franco Oppo, *AmPLY I*, score, partial reproduction of p. 4, © 1976, by Edizioni Musicali EDI-PAN srl, Roma, EP 7887

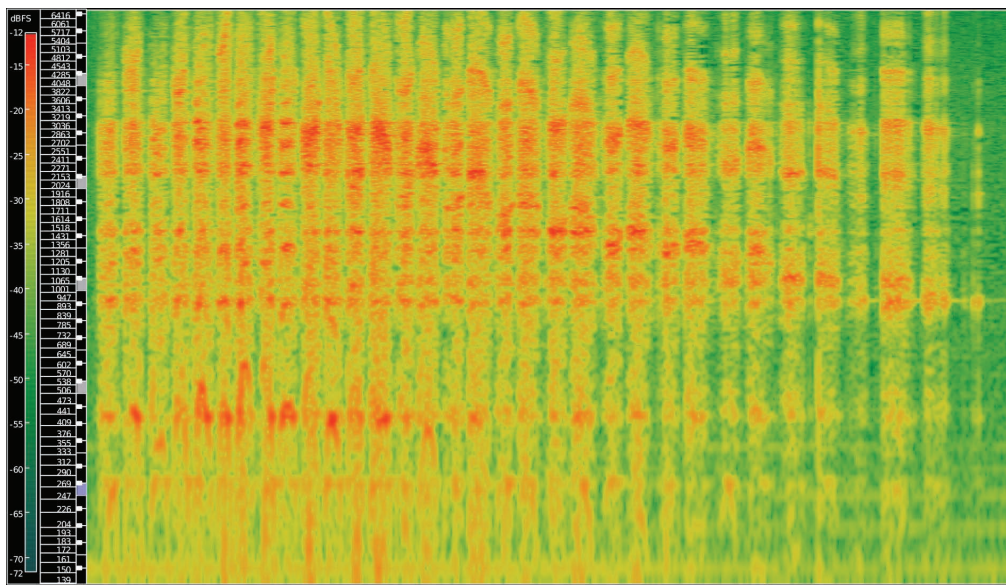


AUDIO 3. Franco Oppo, *AmPLY I*, recorded examples; 1st instrument from 4'14" to 4'20" = Track 1, from 10'14" to 10'22". Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo



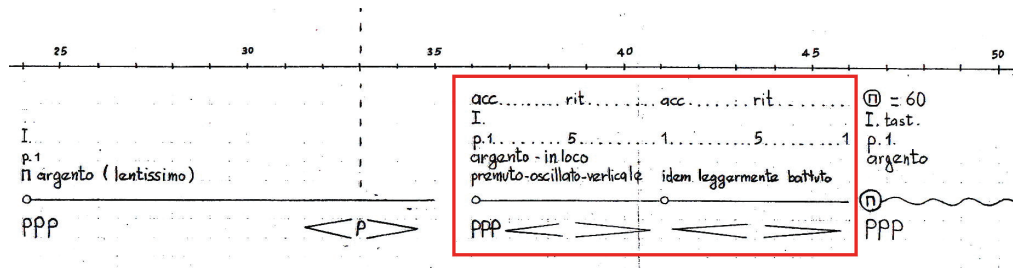
In the second section, which extends from 3'24" to 6'00", the excitation of the strings is introduced through the silver winding of the bow stick; discontinuous sounds (silver and *gettato*) are related to more regular emissions. The two instruments acquire greater autonomy and the imitative relations are sporadic. The dynamic has less contrast and it goes from *ppp* to *ff*. Here Oppo chooses to introduce a type of sound that highlights important harmonic components within a complex spectrum. The example of the 1st instrument from 4'14" to 4'20" (silver with circular bowing with a frequency of 144 *bpm*, *diminuendo*) exemplifies this type of partially harmonic spectrum; the circular movement of silver produces iterated dystonic granular sounds that repeat cyclically for each rotation in a decreasing dynamic (FIGURES 8, 9, AND AUDIO 3).

FIGURE 9. Franco Oppo, *AmPLY 1*, recorded examples; spectrogram of the 1st instrument from 4'14" to 4'20"



Silver, but with different techniques (no translation motion, with pressure and oscillating movement), is used in the example of the 2nd instrument from 3'36" to 3'46"; in this case too the spectrogram highlights harmonic components that carry a greater load of sound energy and therefore stand out in a complex sound spectrum (FIGURES 10, 11, AND AUDIO 4).

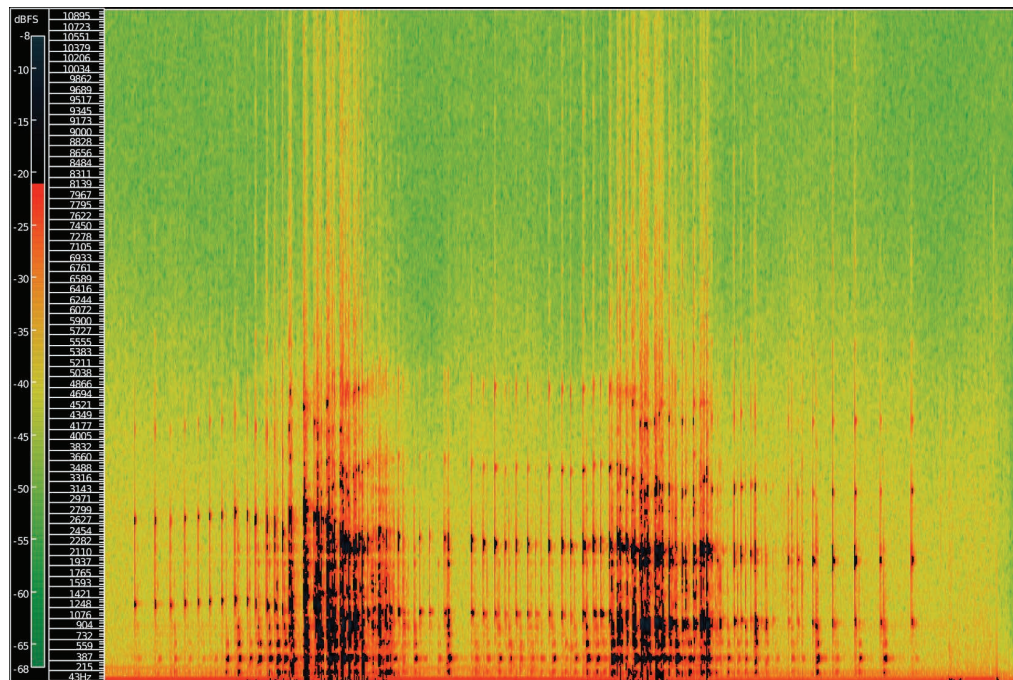
FIGURE 10. Franco Oppo, *AmPLY 1*, score, partial reproduction of p. 3, © 1976, by Edizioni Musicali EDI-PAN srl, Roma, EP 7887



AUDIO 4. Franco Oppo, *AmPLY 1*, recorded examples; 2nd instrument from 3'36" to 3'46" = Track 3, from 0'53" to 1'05". Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo



FIGURE 11. Franco Oppo, *AmPLY 1*, recorded examples; spectrogram of the 2nd instrument from 3'36" to 3'46"



In the third part, from 6'00" to 9'20", the left hand *pizzicato* is modulated in frequency with pressure on the portion of the string between the bridge and the tailpiece. The frequency modulation is only present in this section and contrasts the amplitude modulation, present only in the first section. The dynamic excursion varies from *ppp* to *fff* and ends with a *pp* that accompanies the extinction phase of the section and of the piece: a slight percussion of the strings with the fingers of the left hand alternating with pauses. The relationships between the two instrumental lines are governed by contrapuntal-imitative relationships in the initial part and in the concluding one with very short time intervals. The spectrogram of the 1st instrument from 6'00" to 6'09" highlights the predominance of the harmonic component and the frequency fluctuation due to modulation. The sound presents a pitched variable spectrum (FIGURES 12, 13, AND AUDIO 5).

FIGURE 12. Franco Oppo, *Amply 1*, score, partial reproduction of p. 5, © 1976, by Edizioni Musicali EDI-PAN srl, Roma, EP 7887

The image shows a partial reproduction of a musical score for two instruments, labeled 1º and 2º. Both parts are in 4/4 time with a tempo of quarter note = 160. The score includes performance instructions such as 'rit. molto', 'pizz. m.s.', 'ond. con pressione polp. m.d.', and dynamic markings like 'fff', 'dim.', and 'p'. There are also notes about 'crine' and 'argento' and a 'lento' section. The score is partially enclosed in a red box.

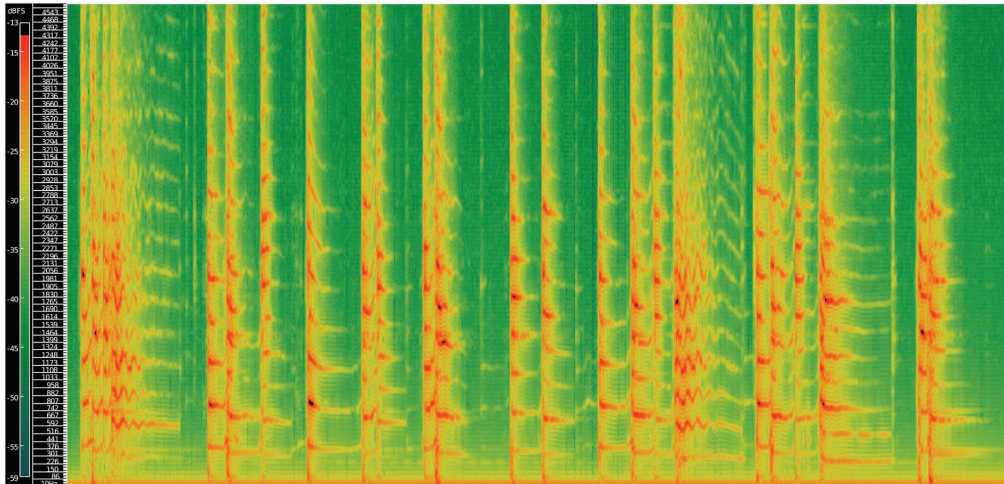
Instrument 1º:
 Tempo: $\text{♩} = 160$ rit. molto.
 Performance: \uparrow ond. con pressione polp. m.d.
 Technique: pizz. m.s.
 Dynamics: *fff* (6'), *dim.* (5), *p* (10), (cresc.) (15).
 Notes: crine, argento.
 Section: pont... tast... pont... (lento)

Instrument 2º:
 Tempo: $\text{♩} = 160$ rit. molto.
 Performance: \uparrow ond. con pressione polp. m.d.
 Technique: pizz. m.s.
 Dynamics: *ff*, *fff*, *dim.*, *p*, (cresc.).
 Notes: crine, argento.
 Section: pont... tast... pont... (lento)

AUDIO 5. Franco Oppo, *AmPLY 1*, recorded examples; 1st instrument from 6'00" to 6'09" = Track 2, from 1'23" to 1'32". Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo



FIGURE 13. Franco Oppo, *AmPLY 1*, recorded examples; spectrogram of the 1st instrument from 6'00" to 6'09"



Oppo elaborates the structure according to the timbre evolution, starting from complex sounds and introducing and making dominant types of sounds with an ever more defined pitched component. *AmPLY 1*, in conclusion, is an elaborate filtering process conducted through the control of the extended techniques of the bowed string instruments. The notes show several moments in the process of organising the material and developing the non-conventional notation apparatus (FIGURE 14).²³ They follow with no precise order as to studies on the notation, on the combinations of groups of sounds, on parts of sections. The control of the randomness is dealt with through mechanisms of varied iteration of elements, framed graphically in the score as boxes. The repetition of an element is determined through fixed or random permutations of values or groupings of 1, 2, 3, 4 or 5 elements, while the multiple boxes widen the choice to several elements. The study of the permutation and recombination mechanisms appears several times in the notes, even though often the sequences obtained do not find space in the score.

FIGURE 14. Franco Oppo, *Amply I*, sketch of elements of the first, second, and third section. Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo

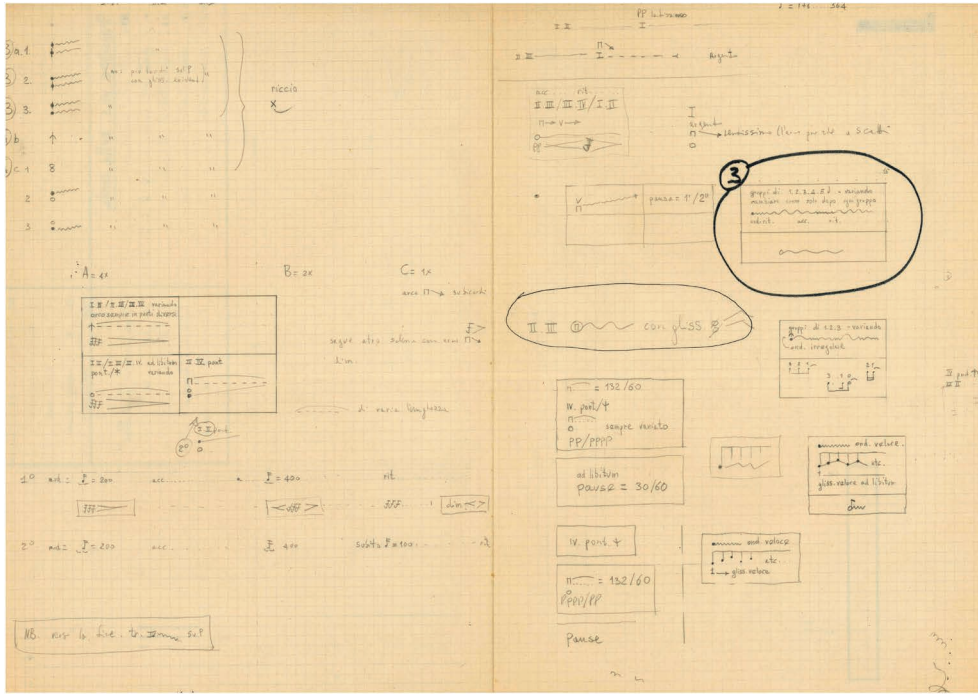
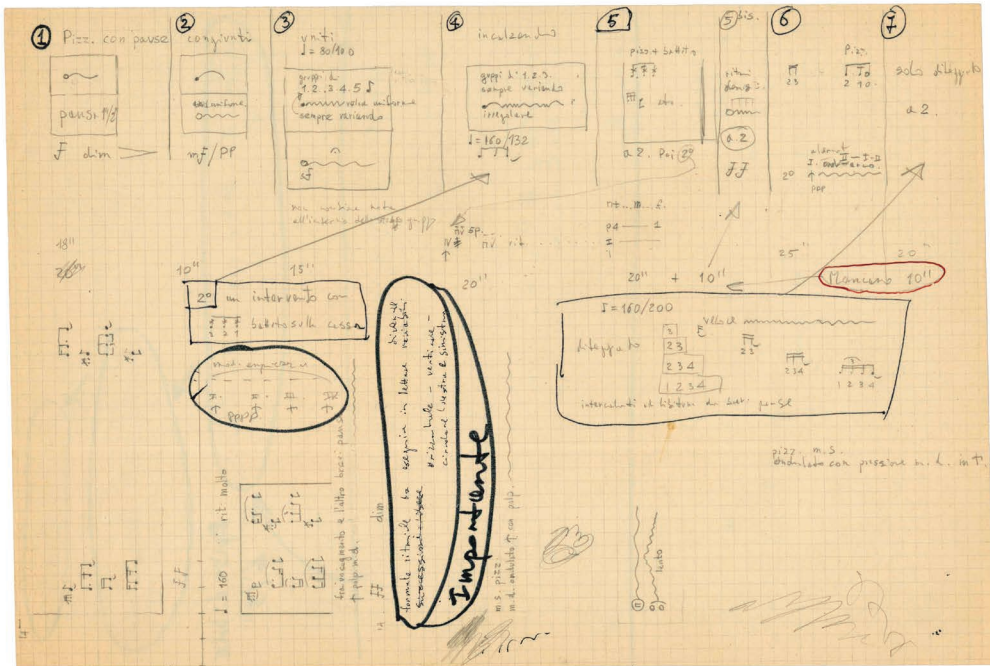


FIGURE 15. Franco Oppo, *Amply I*, sketch of the third section. Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo



The third section, where frequency modulation is used, appears already well defined on a sketch page: all the modulation variants are used in the same order they appear in the score (FIGURE 15).²⁴

AMPLIFICATION

AmPLY I is the first of Oppo's works in which electro-acoustic processing is required. Previously during his stay in Poland, he had visited the Warsaw studio for electro-acoustic music and had come into contacts with composers and technicians; in 1968 he had attended a course in Electronic Composition with Franco Evangelisti at the Accademia Nazionale di Santa Cecilia in Rome.²⁵ The use of amplification in *AmPLY*, however, is probably linked to the availability of equipment for the preparation of the new electronic music laboratory at the Cagliari Conservatorio, for which towards the end of 1975 Oppo had been encharged with presenting a quote.²⁶

The title of the work in the score is *AmPLY I*; initially, Oppo thought to use amplification in other compositions: in fact, in the Fondo Franco Oppo there are some drafts with the *AmPLY II (Attitudu)* title present. The composition was then realised in 1983 with the title *Attitudu* without amplification. There was, however, never an *AmPLY 2*. The electro-acoustic intervention is aimed at improving perception through simple amplification and is, in the composer's mind, neutral towards the quality of the sound; most of the required techniques result in the emission of sounds of low intensity, not appreciable without the intervention of amplification. The use of two contact microphones placed under the strings between bridge and fingerboard is foreseen, connected to one or two amplifiers and two or four speakers.

[...] A wide range of new and unpredictable sounds was explored, but extremely weak and thus not perceived more than a few metres from the instrument; the musical use of these sounds necessarily implies amplification with contact microphones. Therefore, in *AMPLY I* the use of this simple electro-acoustic means goes beyond its normal function, it being the essential means for the realisation of the work, which otherwise could not and would not have reason to exist. This is why *AmPLY I* can only be included in the category of electroacoustic music; and this also in consideration of the fact that the resulting sound, taken as a whole far from the usual one of the bowed string instruments, has all the characteristics of electronic sound.²⁷

Oppo therefore intends to use amplification to make the sounds produced usable and not to change their qualities; in the preparatory material there is no reference to the amplification which, presumably, is introduced at an advanced

stage. The function attributed to amplification and the type of microphone make the interaction between direct sound and amplified sound insignificant. It is only the amplified sound that can make all sounds audible.²⁸

Beyond the original intentions of the composer (neutrality of amplification) and the correctness of the performance, the choice of the microphone influences the sonic quality obtained: the use of the contact microphone eliminates the interaction of the acoustic space and crosstalk problems and preserves only the vibrations transmitted through the body of the instrument. Probably Oppo was aware of this when, years later and with more advanced technology available, he excluded the use of other types of microphone.²⁹

The electronic quality of the resulting sound is not only the result of amplification applied to particular types of timbres; it is above all the fruit of precise choices, such as white noise, silver winding sounds, the contraposition of processing modalities, such as the amplitude modulation for the white noise in the first section and the frequency modulation for the pitched sound in the last, and, in the formal conception, the organisation of the material as a path from the complex sound to the pitched.

THE INSTRUMENTALISTS, THE CONCERTS

The list of documented performances to date is not particularly large and can be divided into three moments. The first performances were by violinists Josephine Beaumont and Silvano Minella in 1976 in Amsterdam and in 1981 in Madrid.

The performances in Cagliari, presumably in the second half of the 1980s, those in Rome in 1988 for *Musica Verticale* and in 1989 for *Novecento Italiano*, and finally in Japan in 1990, were the result of a new interest in the score on the part of Oppo, who proceeded to its revision with new performers Giorgio Oppo on violin and Nicoletta Pintor on cello.

In 2015, in Sassari, on the occasion of Franco Oppo's 80th birthday, Sassari's Conservatorio "Luigi Canepa" organised the first performance prepared without the direct intervention of the composer with Gioele Lumbau, viola, Fabio Lambroni, cello, Walter Ciancusi and Riccardo Sarti, sound directors. There followed performances with the same performers and Sarti directing, in Cagliari in 2016 and in 2017 again in Sassari, with Francesco Abis on cello. Finally, in 2017 in Venice, on the occasion of the workshop *The Creation of Timbre* organised by the Institute of Music of the Fondazione Giorgio Cini,³⁰ there was the performance of Lorenzo Gentili, violin, Paolo Fumagalli, viola, and Paolo Brandi, sound director.

WHICH *AMPLY*?

The 1976 version of *AmPLY* is not the only one on which Oppo had worked. One of the copies of the score presents numerous editing interventions.³¹ The confirmation of these changes comes from the cellist Pintor (historical performer of the second period with the violinist Giorgio Oppo) who describes the meticulous study of this score with Franco Oppo and the changes made on the basis of experiments aimed at finding different timbre solutions and the balance between the two instruments (FIGURE 16).

FIGURE 16. Franco Oppo, *AmPLY I*, modified score, p. 2. Fondazione Giorgio Cini (Venezia), Fondo Franco Oppo

The image shows a handwritten musical score for the second page of *AmPLY I*. It features three staves, each with a different part of the music. The score is heavily annotated with pencil and red ink. Key elements include:

- Staff 1 (top):** Marked with a tempo of $mod. = \text{♩} = 200$. It contains several boxed sections with performance instructions such as "I. II. III. IV. ad libitum", "acc. opp. alla sp. post. diversi", "rit. sempre", "X. ricalco", and "III/IV. variando sempre". There are also dynamic markings like fff and ppp , and performance notes like "pizz." and "pizz. (hand)".
- Staff 2 (middle):** Marked with a tempo of $mod. = \text{♩} = 200$. It includes instructions like "molto rit.", "dim.", and "mf". There are also boxed sections with performance instructions similar to the first staff, including "I. II. III. IV. ad libitum" and "pizz. opp. alla sp. post. diversi".
- Staff 3 (bottom):** Marked with a tempo of $mod. = \text{♩} = 200$. It includes instructions like "dim.", "mf", and "rit.". There are also boxed sections with performance instructions, including "I. II. III. IV. ad libitum" and "pizz. opp. alla sp. post. diversi".

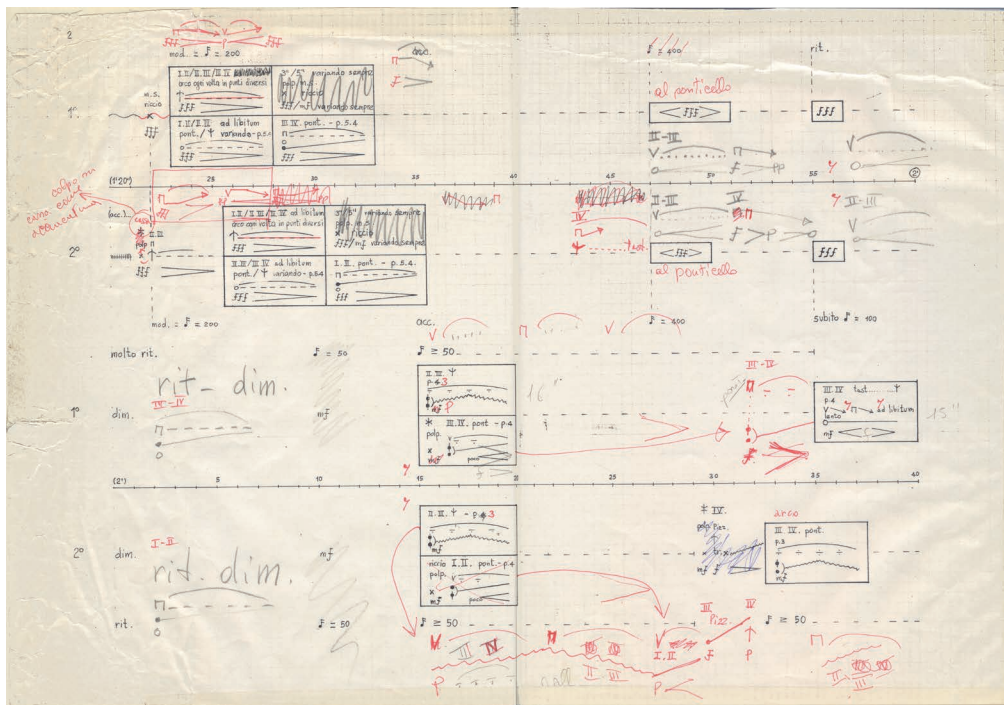
The score is filled with various markings, including arrows, brackets, and handwritten notes, indicating a complex and detailed performance practice. The use of red ink highlights specific changes or performance instructions, while pencil marks provide additional context and structure.

Some pencil annotations support the performance, defining the time intervals between different events or highlight dynamics; other parts in pencil and the parts in red modify the elements, the modalities of performance and introduce some new types of sounds (e.g. percussion with the use of the bow screw). Most of the changes are concentrated in the first three pages of the score – corresponding to the first section – where the main points of articulation are maintained, while the second section contains only marginal changes. The third presents the cancellation

of a segment of 40", from 7'20" to 8'00", where there are pizzicatos with irregular modulations. The more regular frequency modulations and above all the different rhythmic readings of the pizzicatos that introduce the section remain prevalent. The changes would appear to have been introduced in at least three different time periods: in fact there are red erasures of parts in pencil, but also the opposite, to indicate a succession of pencil, red ink, pencil.

Pintor's performance score is not an exact copy of the one modified by Oppo (FIGURE 17). It maintains its overall characteristics, but introduces some variations; the changes are more detailed for the second instrument, but also present for the first; the annotations are also there in pencil and in red.

FIGURE 17. Franco Oppo, *Amply 1*, Nicoletta Pintor performance score, p. 2



So which *Amply*? Undoubtedly in the second half of the 1980s Oppo, constantly working alongside a new generation of performers and the prospect of an, if not frequent at least continuous, re-proposition of the piece, had intended to modify and improve some aspects of *Amply*, obviously recognising the validity of the setting at a distance of more than 10 years from the composition. However, the recording of the examples – as regards the 1976 version – and a telephone interview in 2015

in preparation for the performance in Sassari, in which he referred to the 1976 score and the recorded examples, lead one to think that for Oppo, after almost 40 years, the first score still represented a valid expression of his compositional thinking.

Notes

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- 1 For a general overview of Franco Oppo's character and work see Consuelo Giglio, *Franco Oppo: Nuova Musica dalla Sardegna*, Palermo: L'Epos, 2011; Gian Nicola Spanu, 'Conversazione con Franco Oppo', in: Mario Carraro, Stefano Melis, and Gian Nicola Spanu, *Franco Oppo. Musiche per pianoforte solo e con strumenti*, [Nuoro]: Fondazione Banco di Sardegna, Comune di Nuoro – Assessorato alle Politiche Educative, CERM Ensemble, 2004, pp. 4–64; Antonio Trudu, 'Franco Oppo: il musicista organico', *Insula. Quaderno di cultura sarda*, 6, 2009, pp. 93–120.
- 2 On the differences in approach between European and American composers in the introduction of indeterminacy and on the concept of openness see Angela Ida De Benedictis, 'Opera aperta: teoria e pratica', in: *Storia dei concetti musicali: Espressione, forma, opera*, a cura di Gianmario Borio e Carlo Gentili, Roma: Carocci, 2007, pp. 317–334.
- 3 Giglio, *Franco Oppo: Nuova Musica dalla Sardegna*, p. 54.
- 4 *Rondeau* in the list of works in Giglio, *Franco Oppo: Nuova musica dalla Sardegna*, p. 259, and in Trudu, 'Franco Oppo: il musicista organico', p. 117; but *Rondò per due violini* in the part of the first instrument and *Rondeau per due strumenti ad arco* in that of the second.
- 5 Franco Oppo, 'Per una teoria generale del linguaggio musicale', in: *Musical grammars and computer analysis. Conference Proceedings (Modena 4–6 October 1982)*, ed. by Mario Baroni and Laura Callegari, Firenze: Leo S. Olschki, 1984, pp. 115–130. See also Giglio, *Franco Oppo: Nuova Musica dalla Sardegna*, pp. 181–188.
- 6 '[...] ritengo importante e significativa, nella mia ultima produzione, questo nuovo modo di impostare la partitura: è la continuazione e l'ampliamento della problematica (controllo e razionalizzazione della casualità) del *Rondeau*'. Carbon copy of a letter from Franco Oppo to Michela Mollia, 2 June 1978 (FFO).
- 7 Antonio Trudu, 'Fra alea e stocastica: la musica per chitarra e quartetto d'archi di Franco Oppo. Un esempio di impiego della teoria dell'informazione nella composizione musicale', *Annali della Facoltà di Magistero dell'Università di Cagliari*, IV, 1980, pp. 67–100: 75.
- 8 Giglio, *Franco Oppo: Nuova Musica dalla Sardegna*, pp. 66–68. About the notation and score of *Musica per chitarra e quartetto d'archi* see Jesus Villa-Rojo, *Notación y grafía musical en el siglo XX*, Madrid: Iberautor, 2003, pp. 162–163.
- 9 We refer to the audio recording on tape – carried out by Franco Oppo with the violinist Giorgio Oppo and the cellist Carlo Cabiddu – of examples taken from the score (30 examples for the former instrument and 24 for the latter). The recording was intended as a reference model for the performers in relation to the extended techniques required. The spectrograms and audio examples presented in this article are taken from this recording. See *infra*, footnote 22.
- 10 'La composizione di *AMPLY I* (1976) è stata preceduta da una minuziosa ricerca (condotta

assieme al duo violinistico Minella-Beaumont cui è dedicata) sulle possibilità timbriche degli strumenti ad arco. Sono stati studiati diversi modi di produzione del suono con i mezzi tradizionali, arco e dito (qualsiasi altro tipo di manipolazione degli strumenti è stato escluso), con particolare attenzione a quei fattori che hanno scarso rilievo nella tecnica tradizionale degli strumenti ad arco: punto di sollecitazione della corda, posizione dell'arco, punto di attrito dell'arco, pressione della mano sinistra sulla corda, tipo di movimento dell'arco, tipo di sollecitazione della corda. [...]'. FFO, e.1.

- 11 FFO, a.2.
- 12 Among the works of the 1970s a high level of detail in the indications and notation of extended techniques is present in the string quartet *Gran Torso* by Helmut Lachenmann (1972). Lachenmann uses different combinations of the point of contact and distance from the bridge and of bowing directions (horizontal, oblique, circular, upright) as well as several bow pressure levels. However he does not use winding or the left-hand pizzicato with frequency modulation and the tuning is lowered by major third at the most (violoncello, on the fourth string). Helmut Lachenmann, *Gran Torso*, für Streichquartett, Leipzig: Breitkopf & Härtel, 1988, KM 2233.
- 13 'Nella mia musica la ricerca timbrica e la sperimentazione di nuove tecniche strumentali hanno avuto sempre una funzione notevole. In alcune opere però il timbro e le nuove tecniche assumono un ruolo decisamente preminente ed in Amply diventano addirittura i soli elementi dell'elaborazione musicale. Infatti in quest'opera le variazioni di altezza (melodiche e armoniche) non hanno alcun rilievo strutturale e la scansione ritmica è limitata all'indicazione, in secondi, dello scorrere del tempo. Il messaggio musicale è quindi tutto affidato alla variabilità e alla fluttuazione dei timbri'. FFO, e.2.
- 14 The use of such a low tuning is infrequent. An example from the 1970s is the *String Quartet Describing the Motion of Large Real Bodies* with electronics by Robert Ashley (1972). The strings are tuned down one octave and the bow overpressure with low speed technique is used. See Patricia Strange and Allen Strange, *The Contemporary Violin: Extended Performance Techniques*, Berkeley: University of California Press, 2001, p. 20.
- 15 FFO, d.
- 16 'Non si può scrivere disordinatamente tutto ciò che viene in testa: bisogna selezionare le idee, precisarle, coordinarle, scartare quelle superflue e approfondire quelle con le quali si intende caratterizzare il brano; bisogna fare i conti con la grammatica musicale e con le possibilità tecniche degli strumenti; bisogna organizzare i suoni (strutturarli) in modo che l'interprete e l'ascoltatore possano capire le intenzioni del compositore; bisogna elaborare un percorso, un 'racconto' che l'ascoltatore possa seguire e trovare sensato, o almeno plausibile; bisogna fare in modo che le immagini sonore del compositore siano riconoscibili dall'ascoltatore. In sintesi: la prima fase della composizione è soprattutto fantasia e creatività, mentre la seconda è soprattutto tecnica e artigianato'. Spanu, 'Conversazione con Franco Oppo', pp. 47–48.
- 17 FFO, a.3.
- 18 The time reference and all subsequent ones refer to the score.
- 19 For the terminology of spectromorphological description see Lasse Thoresen and Andreas Hedman, 'Spectromorphological analysis of sound objects: An adaptation of Pierre Schaeffer's typomorphology', *EMS Proceedings and Other Publications, EMS06 – Terminology and Translation – Beijing*. Available: <http://www.emsnetwork.org/IMG/EMS06-LThoresen.pdf> [24 March 2019].
- 20 FFO, a.3.
- 21 The spectrograms were obtained with Sonic Visualiser. See Chris Cannam, Christian Landone,

- and Mark Sandler, 'Sonic Visualiser: An open source application for viewing, analysing, and annotating Music Audio Files', in: *Proceedings of the ACM Multimedia 2010 International Conference*, <http://portal.acm.org/citation.cfm?id=1873951.1874248>. Available: <https://sonicvisualiser.org/sv2010.pdf> [18 March 2019]. The recording of the examples divided into three tracks presents a cut in frequencies around 14000 Hz, probably due to the limited frequency response of the contact microphone used, and a disturbance – only for instrument recordings and not the guiding voice – around 50 Hz (possible shielding defect of the power supply during shooting).
- 22 The recording of the examples was done by Giorgio Oppo on the violin and Carlo Cabiddu on the cello, presumably between 1981 and 1988, before the revision of the score. A copy of the recording is held at the FFO. The complete recording is available on the Digital Archive of the Fondazione Giorgio Cini (section Institute of Music, Fondo Franco Oppo, disco digitale: <https://archivi.cini.it/istitutomusica/detail/IT-MUS-ST0019-000866/amply-esempi-esecuzione-parti.html>), from which the following single-tracks are taken.
 - 23 FFO, a.1, a2, a3, a4.
 - 24 FFO, a.1.
 - 25 Giglio, *Franco Oppo: Nuova Musica dalla Sardegna*, p. 60.
 - 26 In the letter to Walter Branchi of the Conservatorio of Pesaro of the 6 November 1975 he announces the institution of the electronic music course at the Conservatorio of Cagliari – '[...] the new director (Nino Bonavolontà) does not put up any resistance [...] [il nuovo direttore (Nino Bonavolontà) non oppone resistenza]' – and asks for a list of the equipment available and a copy of the estimate. Carbon copy of a letter from Franco Oppo to Walter Branchi, 6 November 1975 (FFO).
 - 27 '[...] È stata così esplorata un'ampia gamma di sonorità nuove e imprevedibili, ma estremamente deboli per poter essere percepibili a più di qualche metro dallo strumento; l'utilizzazione musicale di queste sonorità implica perciò necessariamente l'amplificazione con microfoni a contatto. Pertanto in *AMPLY I* l'uso di questo semplice mezzo elettroacustico va oltre la sua normale funzione, essendo esso il tramite essenziale per la realizzazione dell'opera, la quale altrimenti non potrebbe né avrebbe motivo di esistere. Per questo *AmPLY I* non può che essere inclusa nella categoria delle musiche elettroacustiche; e ciò anche in considerazione del fatto che il risultato sonoro, nel suo insieme assai lontano da quello consueto degli strumenti ad arco, ha tutti i caratteri del suono elettronico'. FFO, e.1.
 - 28 Even George Crumb in *Black Angels* (1970) requires the use of a 'fine quality contact microphone', although subordinate to the lack of 'genuine electric instruments'. However, the positioning of the speakers and the use of reverb determine a different relationship between direct sound and amplified sound. George Crumb, *Black Angels: thirteen images from the dark land*, for electric string quartet, New York: Edition Peters, 1971, EP 66304.
 - 29 During an interview with Riccardo Sarti, who was responsible for directing the sound for the performance in Sassari in 2015, Oppo specifically requested the use of contact microphones, excluding the use of directional microphones.
 - 30 <https://www.cini.it/eventi/workshop-la-creazione-del-timbro-gli-strumenti-ad-arco-amplificati-george-crumb-franco-oppo-fausto-romitelli-giacinto-scelsi>
 - 31 FFO, b.