Marco Antonio Juan de Dios Cuartas: The incursion of stereo into Spanish popular music: the English influence in the definition of a local sound through the professional exchanges between Madrid, Barcelona and London

Abstract

In Spain, the role of the engineer and the music producer emerges at the beginning of the 60s from the "imitation" of the Anglo-Saxon model. The English professional experience of producers and engineers such as Alain Milhaud and Pepe Loeches, helps to import some of the technical methodologies used in English recording studios into Spain. Production equipment from Abbey Road is sent to the EMI studio in Barcelona, allowing stereo recordings to be made with mixing consoles previously used in The Beatles' productions. The introduction of stereo to Spanish productions does not seem to have come much later than in other markets like the UK or the US.

The incursion of stereo into Spanish record productions of the 60s

The evolution of recording studios must necessarily be linked to certain processes of globalization. Ulrich Beck defines globalization as a "process that creates links and transnational social spaces, revalues local cultures and brings third cultures to the foreground" (Beck: 1998, p. 30). We can thus speak of an emerging global culture and the global cities in which it develops (Featherstone: 1990, King: 1991, Hannerz: 1991). Perhaps one of the main consequences of this "sonic globalization" is, without a doubt, the loss of hegemony in the record production processes of the major capitals of the music industry, from the UK-US centre of reference to the periphery represented by other countries which, as in the case of Spain, will end up assuming the production methodologies of their centres of reference, creating an infrastructure of recording studios adapted to the new sounds. But the production of Spanish popular music, at the beginning of the sixties, witnesses a

professional migratory phenomenon towards England, seeking in its place of origin the authenticity of the sonority of the British popular music productions. This fact was determined mainly by the lack of confidence of musical producers towards the human and technical resources of the Spanish recording studios of the time: the Spanish recording industry in these early years did not yet have an adequate infrastructure to face the new sounds of pop and rock. From a historical perspective, from the 1950s standards of sound deriving from the creation and implementation of certain pieces of equipment in recording studios -including certain mixing techniques related to the use of stereo panning- meant that a particular English or American sound could be "distinguished". Both of these countries decisively influenced the musical productions made in other Western countries that, as in the case of Spain, did not have an industrial fabric capable of accommodating the needs of music producers. In regard to music production, this would force Spain to become a country that imported audio technology, absorbing the "sonic imperialism" exercised mainly by the English due to geographical proximity. Only those societies that could afford the necessary technical requirements were able to adopt the aesthetic canons proposed in English and American productions:

> […] the more music aesthetics are defined by sound, and hence by technology, the more those who own the means of production and the expertise to operate them will be also able to control the music market and the musical discourse on a global level. Music production technology and the discourse on technology act as gatekeepers: those who lack full access to technology will not be able to participate in the definition of musical aesthetics. (Nardi: 2015)

The socio-economic situation of a country must therefore be considered an influential element in the sound aesthetics of record productions, and this should be taken into account when analysing and historically contextualising these productions. Popular music in Spain often imitated English or American record productions, which also entailed using the same recording devices. In this respect, the audio engineer Pepe Loeches (1979) raised what has always been one of the main difficulties when acquiring and upgrading the devices that are involved in the recording process: being a country that was fundamentally an "importer", the increase in cost and the difficulty in accessing certain pieces of equipment were added problems when competing with the international recording industry:

> One of the biggest problems we have to contend with is the acquisition of recording equipment — as there are no local manufacturers it all has to be imported. Consequently, arranging orders and shipping of equipment can cause considerable problems and high import taxes can often double, and some-

> times triple the cost of the equipment. Nevertheless, the money, time and patience are usually found, to thoroughly equip studios.[1]

The importation of English equipment such as Neve, which had a great impact on Spanish recording studios during the 1970s, together with the application of acoustic designs under international standards (Westlake-Eastlake acoustic design), progressively reduced the differences between Spanish recording studios and those of their English or American counterparts. To this, it also contributed the establishment of multinational record companies in Madrid or Barcelona that built their own recording studios mirroring the designs of others located in London or the USA –as it is the case of EMI in Barcelona or RCA in Madrid. To cite a relevant example, Neve mixing consoles, whose importance to music production during the 1970s is unquestionable, appeared in Spanish studios at the same time as in recording studios in the Anglo-Saxon world. To this effect, the American magazine *dB* published the following report in February 1969:

> The largest music-recording control console yet built by Rupert Neve and Company Limited, has been installed in the New York studios of the Vanguard Recording Society, Inc. The Cambridge, England-based firm's console embodies twenty-four input channels, sixteen output groups, four echo groups, and two foldback groups. The console also has comprehensive four-speaker monitoring and re-mix for sixteen tracks. This is their second installation for Vanguard, the first being a sixteen-channel mastering console. Neve has recently completed two consoles installed in Spain and is currently working on units for re-recording desks for Pye Records, Ltd., and Associated British Pathe Ltd., both of England.[2]

The recording industry focused on the two main cities of the country for one simple reason: it was in these cities that the offices of the major record companies were located, and especially, the headquarters of the international companies. During the 1970s, small studios were proliferating in other cities, but always with an inferiority of resources that, in general, turned them into "second-rate" studios.

EMI had its own recording studios in Madrid, but the studios located in Barcelona were especially important. Although the recording studios housed at the headquarters of international record companies usually boasted competitive technology, they were fitted out with equipment that had been updated in their studios of origin. Ramón Arcusa and Manuel de la Calva tell how material from Abbey Road found its way to the EMI studios in Barcelona, allowing them to make their first recordings in stereo:

[1] Interview of Pepe Loeches in *Studio Sound* magazine in a special issue published in the autumn of 1979 titled *International Recording*.
[2] 'People, Places, Happenings': *dB*, Vol. 3 No. 2, February 1969.

> In Barcelona we were lucky enough to record with a good company that was EMI and also to have a great sound engineer, and great musicians. Perhaps in that sense Barcelona was a bit more advanced than Madrid, but Madrid caught up very quickly… Initially we recorded the early songs, until 1964, in mono. Then, suddenly, The Beatles had an eight-track [machine] instead of a four-track in London, and the same company sent the four-track that they left behind to Barcelona and there we recorded several songs. We recorded the first stereo in 1964 on a console with which The Beatles had recorded in their time. *Love Me Do* had been done there.[3]

The incursion of stereo into Spanish commercial recordings –it must be remembered that research into stereo began in the 1930s– does not seem to have come much later than in other markets like England or the United States. In an article about the Hispavox studios in Spain, the March 1961 issues of the journal *Audio Engineering* noted the experimentation with multiple microphones and the evolution of the early techniques of stereo recording:

> How would you like to take on the assignment of recording one hundred guitars in stereo? Someone on the staff of Hispavox Records in Spain was recently handed just such a job. The group includes sections that play the *laud* (a relative of the lute) and a contingent of *bandurrias*. These three main sections are further subdivided since all instruments are employed in both large and small sizes. All told, eight types of guitars are represented in this orchestra which consists entirely of blind musicians. During the recording session, the instructions of the conductor were relayed to each individual player by means of earphones. Half the selections were composed by the conductor, Rafael Albert, indicating that a somewhat specialized guitar repertory is required by a group of this size. Serenades and dances figure heavily in the choice of tunes. The sound, when heard on a full-fledged stereo system, is difficult to describe in terms of everyday comparison because I've never experienced anything like it. Multiple miking must have been used in a ball of exceptional liveness in order to capture so effectively the full impact of the total ensemble without losing the fine detail in the sound of each section.

Both the recordings made during the early 1960s in the Hispavox studios in Madrid and those produced in Barcelona, a consequence of the technological trade-off with Abbey Road studios in London, demonstrate that stereo recordings were already a reality during the first half of this decade. Although the techniques of stereo recording began to be generally used during this period, the most experimental uses of the stereo panorama were mainly developed in popular music recordings than in other types of productions

[3] Interview broadcast in 2014 in the programme *Música Ligerísima* of TVE Spanish television network.

related to traditional music (eg Flamenco[4]) or classical music (eg Symphonic Music or Zarzuela).

The professional exchanges that took place during this period between Madrid, Barcelona and London seem to have been constant, such as the above-mentioned case of Pepe Loeches, of compulsory study in the history of record production in Spain. After working as an apprentice at the Hispavox studios, Pepe Loeches moved to England in 1969 to work at the Pye Records studios in London, where he remained until 1975. Loeches' return to Spain somehow implies the importation of some of the Anglo-Saxon work methodologies into Spanish production, exerting an important influence over other professionals and recording studios in which he subsequently worked: Kirios, Eurosonic and Musigrama.

Despite some of the professional experiences of Spanish engineers were able to transmit greater confidence to producers and record companies, in the Spanish recording industry it was common practice, at least in an early stage, to carry out the music productions with the biggest budget in recording studios in London. In order to obtain an international product, with the characteristic sound of the English productions, the safest thing to do was to travel to a London studio and work with its engineers and session musicians.

A case study: the record productions of Alan Milhaud

Although Spain has a remarkable industry linked to record production prior to the 60's, there is no "physical infrastructure" capable of "emulating" the "English sound" related to the incipient rock, nor have the rules inherent in a "practice of recording", methodologically different from that carried out in Spanish recording studios up to that time, been assimilated. For René de Coupaud, Spanish musician and producer who began his professional career in the 70s, the process of professional adaptation to new production methods related to the new sounds of popular music came slowly:

> In the studios, there was no experience of recording that kind of music, neither the musicians nor the arrangers were ready. The most successful at the beginning was Milhaud, because he did know where he could turn to. In London, with some specialised session musicians, it was all easier, so even in the mid-70s -although in Spain we already had great professionals- some producers were still choosing to record in English studios. Recording abroad

[4] In Flamenco, the use of reverb acquires a special relevance in order to achieve a greater sense of space and amplitude in the stereo mix. In this case, the reverb encourages the ritual character of a music that seeks to immerse the listener in the space in which the performance is developed.

> was logically more expensive, but as it took less time to do it and the results were also guaranteed, it was chosen to do so.[5]

Alain Milhaud, a musician of French origin –who initially began his career in Barcelona at the beginning of the 1960s, and subsequently moved to Madrid– was the first music producer in Spain. Milhaud's professional development will be conditioned by his relationship with the record industry of London, Madrid and Barcelona, maintaining a continuous exchange through his projects, whose influence on the subsequent Spanish discographic production is indisputable. Milhaud interrupted his Economics and Politics studies to fully concentrate on conducting. Curiously, this sparked his interest in the world of recording as he began "to note the enormous difference between the sound mass that he received from the conductor's podium and that which came from the speakers in the sound booth" (Domínguez: 2002, p. 268). What Milhaud initially pursued in his productions is in line with Ed Ward's description of the Rolling Stones' record productions (1969) in an article cited by Frith (2012) analysing the role of the producer in the discourse of rock: "They spend a lot of time remixing and overdubbing, but the end result is always credible –one can imagine little Stones performing in the speakers" (in Frith: 2012, p. 211). But the reality of the recording studios in Barcelona at the beginning of the 1960s was dramatically different: the enormous difference between what was recorded and what was definitively heard through the speakers minimized the credibility that Ward mentioned, discouraging Milhaud, who intended to use his practical experience in the portable studio of the Belter[6] record label to acquire the skills necessary to allow him to practise the profession of producer as he conceived it. During these three years at Belter, Milhaud had the opportunity to produce bands including Los Gatos Negros, Latin Combo and Los Tres Sudamericanos, as well as many flamenco recordings such as *Antología Flamenca* by Dolores Abril and Juanito Valderrama.

After his stage at Belter, Alain Milhaud arrived at EMI-Odeón as manager of the international catalogue –receiving samples of the records released by EMI International and selecting those he considered could be launched in Spain[7]– and as national A&R. In Milhaud's own opinion, during this period there was only one serious studio in Barcelona, which was La Voz de su Amo (HMV: His Master's Voice) and which formed part of the business fabric of the British firm EMI: "They had a studio set up by the English, the

[5] Taken from the interview made to him on 11 August, 2014 by the author of this article.
[6] A recording company created in Barcelona in 1954 that remained in operation until 1984.
[7] The case of The Beatles deserves an analysis of its own. In Spain, the distribution of their music was limited on the express order of the company's sales manager, who prioritised the launch of the Spanish version of the band's hits by the group Los Mustang over the original songs.

material was fairly basic, but the best that there was at the time".[8] But Milhaud's time at EMI was very short –only three months– after which he moved to Madrid to lay the foundations in the history of Spanish record production. Milhaud's concept of recording studios in Spain during this period was very negative:

> Recording studios in London and studios in Spain were completely different, both in regard to technical equipment and the engineers. I'll give you an example: the first time I attended a recording in London, half an hour before the recording, the engineer was already there in the studio adjusting the "azimuth" of the heads of the tape recorders.[9]

The gap Milhaud refers to, regarding the training of the Spanish recording-studio engineers with respect to those of other countries like England, justifies the fact that he chose to make his recordings outside Spain during this period, despite belonging to a company (Spanish Columbia) that had its own recording studios in Madrid: "As an artistic director and producer, the most logical decision in pursuit of that professional quality was to leave".

Alain Milhaud's professional experience in England helped some of the standard work methodologies in English recording studios to be imported into Spain. This is the case with the song "Black is Black" by the Spanish band Los Bravos. For this 1966 production, even though he had the company's own studios in Spain at his disposal, the song's producer Alan Milhaud decided to go to Decca Studios in London.

"Black is Black" was recorded at Decca Studios in London by session musicians, the only exception being the recording of the lead vocal by Mike V. Kogel and the backing vocals by Toni Martínez. Although it could be considered far from the "authenticity" of a rock production, this work methodology was quite common at the time and was part of the decisions the music producer had to make to obtain an optimal production, both at a musical and technical level. One might think that using session musicians and foregoing part or all of the band's musicians, goes against "authenticity", which was perceived as a paradigm of the rock genre, a paradigm that was under construction during the 1960s. Some producers consider other practices, such as overdubbing or editing with the intention of correction, as actions that make rock music less "authentic".

The recording of "Black is Black" at Decca Studios was carried out by a young Bill Price, an English audio engineer (at this time a "balance engineer", a term used to describe the engineers in charge of "balancing" the

[8] All statements by Alain Milhaud are taken from the interview made to him in 2014 by the author of this article.

[9] In a magnetic recording system, the "azimuth" defines the direction of the head of the recording and/or reproduction with respect to the tape and forms part of the necessary adjustments for a correct maintenance of the sound recorder, enabling optimum recording and reproduction.

level of the different mixed instruments through the console faders) and subsequently a producer as well, who was at the beginning of his professional career at the time. Price would go on to work with artists such as Tom Jones, Eric Clapton, The Moody Blues, Mott the Hoople, Pink Floyd, Paul McCartney, Elton John, The Pretenders, The Waterboys, The Clash and Sex Pistols. Milhaud described the recording session in the following terms:

> It was recorded on four live tracks. It was recorded with everyone in the same room, and with the singer in a booth. Mike sang live but later he effectively sang it again, doubling his voice himself and Toni doubling. The whole rhythm section was on one track, the brass on another track, the voices on the third and the rhythm section was divided; the bass was on a track as well. Panels were used inside the room to try to separate the instruments, and headphones for the musicians as well. Mike's voice was in a separate booth, there was no leakage, the voice was clean and the channel was clean.

The session musicians would have used the first recording of the solo voice as a guide for playing the song, performing a second time for the independent and isolated recording of the voice in relation to the rest of the instruments. The presence of the reverb from the echo chambers in Mike V. Kogel's voice is clearly noticeable in the mix, adding spatiality to a lead voice that is situated in the centre of the stereo field. The focus of the sound source in the foreground is diffused in the "soundbox" –applying the methodology proposed by Alan F. Moore (2012)– by the reverb action, blending the main voice with the rest of the elements in the mix (Fig.1).

The musical arrangement is not based on a staggered polyphonic beginning in which the different melodic lines that are introduced at different pitches are interwoven, but in this case the sound block is created through the introduction of the different elements in unison. The real contribution of the progressive increase in the instrumentation derives, on the one hand, from enrichment at the timbral level with the progressive incorporation of elements into the recording, which reaches a climax with the harmonics that are generated as a result of the reflections caused by the lead voice

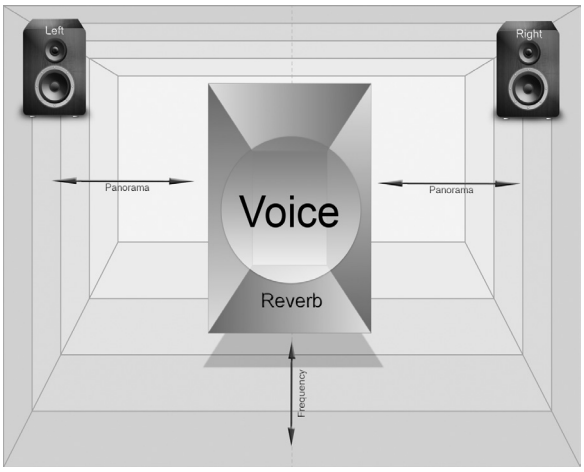

Figure 1: Location of the lead voice inside the "soundbox" and projection of the reverb in the lead voice of the song "Black is Black" (1966) (Drawn up by the author).

and, on the other hand, from the progressive increase in the "stereo width", playing with the phased incorporation of instruments to the left and right of the panorama.

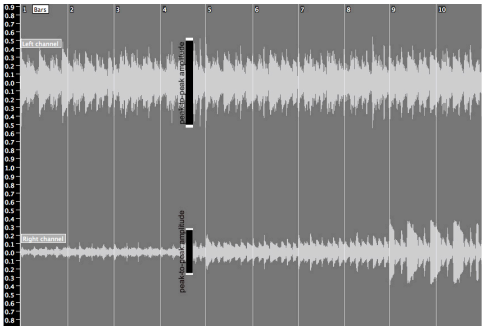

Figure 2: View of the wave shape of the introduction to the song "Black is Black" (1966).

These characteristics can be clearly seen in a comparison of the harmonic content generated by the spectrogram in each part of the introduction prior to the entry of the lead voice. The evolution of the harmonic content must be connected to a conception of the stereo mix in accordance with what Moore (2012) terms a "triangular" mix, placing the voice in the centre and grouping the rest of the elements that make up the different layers of the mix to the left or right. This is the main reason why there is a significant difference between the amplitude of the left (L) and right (R) channels of the phonogram during the introduction (Fig. 2 & 3).

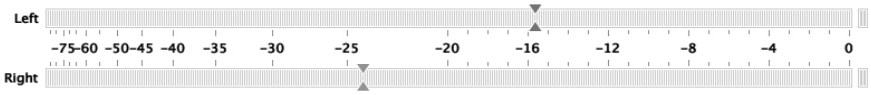

Figure 3: RMS level during the introduction to the song "Black is Black" (1966).

If the levels of both channels during the introduction are observed on a RMS meter, it can be seen how there is a difference of about 10 dB calculated on the RMS level of the master. This initial decompensation of the channels is balanced by the progressive incorporation of the instrumentation during the introduction. As Alan Moore (2012) points out, the extreme panning of the elements in the mix, including the voice ("cluster mix"), is part of the configurations used before the consolidation of the "diagonal mix" and in which the solo voice, snare drum and bass are located in the centre on a slight diagonal (Fig. 4).

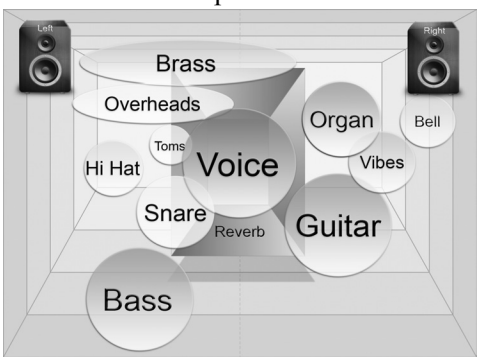

Figure 4: Distribution of the elements of the stereo mix in the "soundbox" (Drawn up by the author).

The presence of low frequencies in both channels of the stereo, as pointed out by Moore (2012), does not become a standard until the 1970s. The distribution of the elements in stereo must follow certain rules, for example, the bass drum and bass go in the middle because the surface of two loudspeaker membranes, which have to simultaneously transmit a low sound, is better than an individual loudspeaker with half the surface. The fact
that the bass is situated on the left causes a poor distribution of frequency energy. A comparison of the spectrogram generated by the left channel –to which the "drum set" and the bass are panned– and the right channel –with a minimal presence of what Owsinski (2013) calls base or "foundation"– provides a clear idea of the harmonic content generated by this layer of the mix during the first four bars of the theme (Fig. 5 & 6).

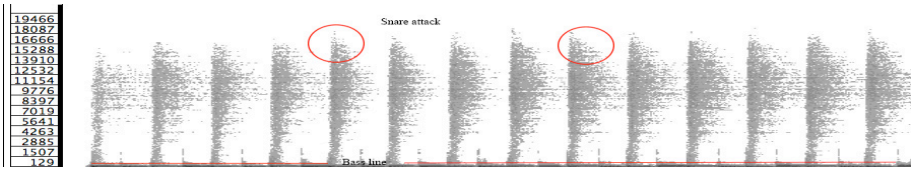

Figure 5: Spectrogram of the left channel (L) of the first four bars of "Black is Black" (1966).

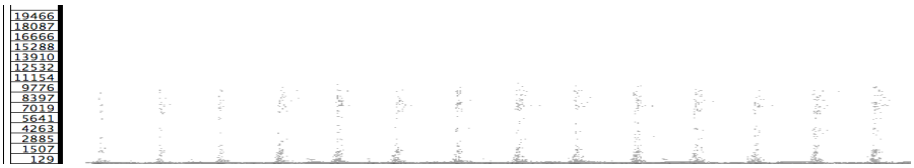

Figure 6: Spectrogram of the right channel (R) of the first four bars of "Black is Black" (1966).

The energy of the attack of the "drum set" snare generates harmonics in the left channel (L) that virtually reach 20kHz and musically represent the rhythmic motor of the theme, while the frequency presence of these elements in the right channel (R) is limited to reproducing the reflections that the base or "foundation" generates in a large room like the one in which the song was recorded. The predominance of the left channel over the right in these first bars can be clearly seen on a Goniometer or Lissajous stereo field analyser (Fig. 7).

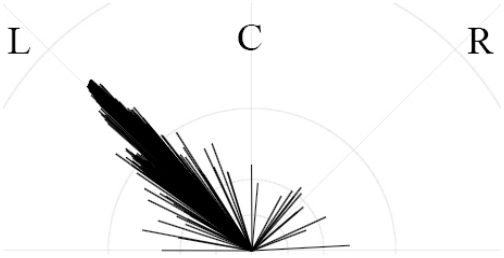

Figure 7: Stereo image from the introduction to "Black is Black" (1966).

Although mono recording and mixing evidently required some rules of positioning and angulation of the microphones, the development of binaural recording techniques will require that the distances between the microphones placed before the sound source are adequate for the sum to occur correctly and without cancellations. Regarding the recording process of Black is Black, Milhaud pointed out the following:

> An ambient stereo mic [overheads] was placed. The kick had a special dynamic mic, then the snare, the toms, and so on. The toms were individually miked. All that was put into a group -the mixing console had the possibility of working with individual channels and groups- and afterwards, the balance of the drums was made for the group. Then the lead voice was added and it was balanced with the rhythm section (drums and bass). Finally, the rest of the harmonic instruments were also added.

It is more than likely that Milhaud refers to "stereo pair" (two "mono microphones" that represent the left and right channels and that are positioned following a certain microphone technique based on their location, distance and angle with respect to the sound source) instead of "stereo microphone" (a single device with the ability to pick up two left and right signals simultaneously). The Decca Company maintained a constant concern for the application of new microphonic techniques aimed at capturing and expanding the stereo width within the mix. In 1954, Arthur Haddy, Roy Wallace and Kenneth Wilkinson developed the "Decca Tree" technique, a stereo microphone pickup system for large orchestras. The "Decca Tree" consists of a set of three microphones with an omnidirectional polar pattern -sensitive to pickup in all directions- spaced according to the desired width and stereo amplitude. The search for mono compatibility in stereo mixes, interpreting this as the result of the sum of both channels (Left and Right), has been part of the work methodology of the mixing engineer from the consolidation of the stereo mix to the present. All mixing consoles have a “switch” type commutator that allows L+R to be heard. This enables technicians to monitor the possible phase cancellations that occur when performing this action and to anticipate the possible results of listening to the phonogram on a mono device –a turntable with a single loudspeaker, for example– or in a “mono” radio broadcast, which was common during the second half of the 1960s. The use of a correlation meter shows how during these first four bars of the song, the meter registers negative values, therefore implying the disappearance of the mono compatibility of the stereo mix (Fig. 8).

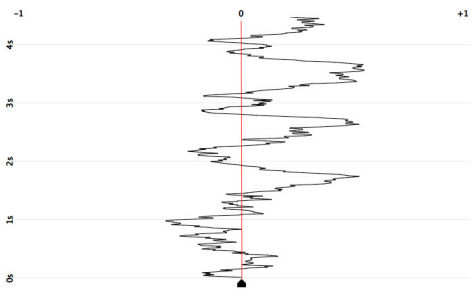

Figure 8: Correlation meter during the introduction to “Black is Black”(1966).

The October 19, 1968 issue of *Billboard* magazine published an interview with Milhaud: "Alain Milhaud was one of the first record producers in Europe to recognize that to compete with British and American product it was essential to produce an Anglo-American sound and to get his artists to record in English". Milhaud's objective was to obtain a product with an "international" sound, which implied a significant qualitative leap in comparison with his first recordings in Barcelona, only four years earlier. His ultimate goal was to be successful on the English and American lists, competing with the local bands: his strategy was based on proposing recording projects, bridging the gap as much as possible between his language as a producer of Spanish bands and the Anglo-Saxon bands whose sonic language was his "mother tongue".

A comparative analysis of the recording of the song "Speedy Gonzales" by Los Gatos Negros (1962) at a macro-timbral level –recorded at the Casino de la Alizanza in Barcelona with the portable studio of the record company Belter– and "Black is Black" by Los Bravos (1966) –recorded at Decca Studios in London– presents a very significant picture. A comparison between the spectrogram that each phonogram generates shows how the spectral content of the song by Los Gatos Negros, recorded with very limited resources, is mainly represented by midrange frequencies: the harmonic content is restricted up to 6 kHz. There is a complete absence of high frequencies and, as a consequence of the limited number of microphones and channels, no key elements can be detected in the lower area of the frequency spectrum of a pop-rock song such as, for example, the bass drum (Fig. 9 & 10).

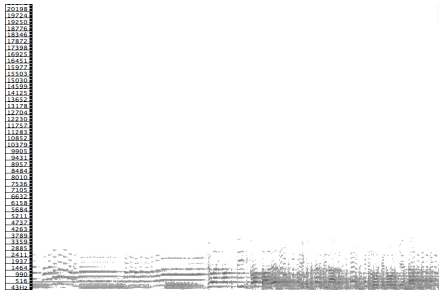

Figure 9: Harmonic content of the song "Speedy Gonzales" by Los Gatos Negros (1962).

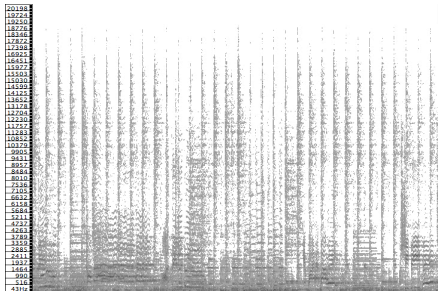

Figure 10: Harmonic content of the song "Black is Black by Los Bravos (1966).

In terms of the horizontal dimension (panorama), a comparison between the treatment of the stereo field in the mix of the songs by Los Gatos Negros and Los Bravos reveals a considerable widening of the stereo width in "Black is Black" with respect to "Speedy Gonzales". The latter has a much narrower stereo field, an almost mono mix with the single opening on the

horizontal axis that creates the reverb reflections applied to the voice (Fig. 11 & 12).

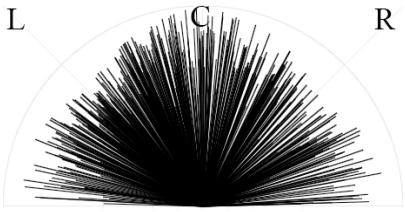

Figure 11: Stereo image of the song "Black is Black" by Los Bravos (1966).

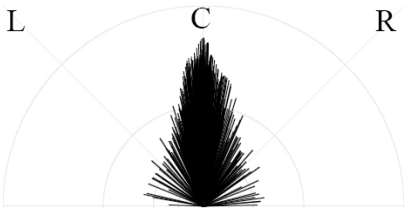

Figure 12: Stereo image of the song "Speedy Gonzales" by Los Gatos Negros (1962).

The representation of the stereo image on the Lissajous Meter corresponds to a moment in the song when all the elements of the production have already been introduced. There is also a greater presence of the frequency axis within the three-dimensional conception of the mix in comparison with the poor stereo image of the song "Speedy Gonzales".

An analysis of the correlation of the song "Speedy Gonzales" yields a phasometer with measurements close to +1, that is, the information in the left and right channel is very similar: the monaural compatibility is complete because the mix has a poor stereo image.

Conclusion

The incursion of stereo into Spanish music production does not seem to have taken place much later than in the recordings made in the Anglo-Saxon world. During the first half of the 1960s, the Spanish recording industry presented a mixed picture in regard to the quality of its technical and human resources, with considerable differences with respect to the results obtained from one recording studio to another. While some studios, such as EMI International in Barcelona –with the transference of technology from London– or the Hispavox company in Madrid, offered some guarantees of quality that led their artists to record there, some producers like Alain Milhaud decided to move to studios outside Spain in order to achieve the English sound "in situ" and sought-after international projection, in light of their distrust of the technological possibilities and human resources in the recording companies' local studios. But the fact that Milhaud began to work on his Spanish recording productions (Los Bravos, Los Canarios, Los Pop Tops) with the engineer Bill Price at Decca and with Adrian Kerridge at Lansdowne Studios, implied, on the other hand, the importation of certain work methodologies that were progressively established in the new business fabric in Spain associated with the emerging recording studios from the second half of the 1960s. Lon-

don was not only the Mecca of pop-rock, the city that had catapulted bands of reference for Spanish artists onto the international stage, but the nerve centre of the great recording studios: sounding like the English bands necessarily implied travelling to make recordings at the same studios in which these had been made. As part of certain work dynamics in which it was common for a band to record a demo at the record company's studios and subsequently go to London to make the definitive recording before returning to Madrid, it was inevitable that a progressive incursion into the work methodologies of the British studios would take place in Spain: microphone techniques, the use of reverb, stereo panning of the elements of the mix, fitting out of equipment, organisation of rehearsals with session musicians, etc. Without entering into the debate as to whether or not recording engineers in Spain during this period were technically qualified to take charge of the recordings of the emerging pop and rock groups, it is important to point out that apart from technical knowledge, their main shortcoming was a considerable ignorance about the timbral characteristics of a new music that was built around a new concept of the recording studio. From this point on, the recording studio became a creative space through techniques derived from multitrack recording, microphone placement, and the effect of reverb or distortion, which now became one more artistic parameter. While the 1962 song by Los Gatos Negros analysed here and recorded during Milhaud's Barcelona period had already completely assimilated the stereo format, the work methodology inherited from mono sound was still in force and was reflected through the scarce use of panorama in the horizontal axis of the mix. Although the use of stereo now allowed a particular sound space to be simulated, the opening up of the stereo field was modest, with the majority of the elements of the mix still located in the centre.

The necessary "adaptation to the genre" of technical staff accustomed to making live recording of symphony orchestras, stars of *copla* and other popular or traditional music genres, gave rise to a lack of trust on the part of some producers. In some instances, as in Milhaud's case, Spanish producers of this period decided to record in studios outside Spain (for example, Maryní Callejo chose to make his recordings in Italian studios). But the social impact of pop-rock music, and the definitive commitment of recording companies in response to the commercial viability of the genre, led to an essential upgrade in the technical resources of some Spanish recording studios. Many evolved substantially during the second half of the 1960s, and grew exponentially over the next decade, with the appearance of a significant number of independent studios at the service of the large recording companies.

The visual representation of the stereo mix, based on the theoretical approaches of authors including Allan Moore (2012), have assisted this analysis of the distribution of the elements of the mix in the stereo band, as well as the progressive incorporation of musical instruments from left to right, using

the stereo contrast as another technique available to the artistic producer. On the other hand, visual monitorisation instruments, such as the spectrum analyser or Lissajous Meter, indeed reflect the timid approaches to stereo in the early recordings of rock music in Spain, a consequence of the technical limitations and the professional inability of recording engineers to adapt to the new musical genre in equal proportions. The qualitative leap in the work carried out in British studios represented a point of reference for Spanish audio engineers who, as in the case of Pepe Loeches, decided to supplement his professional experience in London. These professional experiences, together with the influence exerted by the presence of recording studios belonging to delegations of international recording companies in Spain, as in the case of EMI, would lay the foundations for the development of stereo mixing techniques in Spanish music recording.

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Discography

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