Examiners' Report
Principal Examiner Feedback

Summer 2019

Pearson Edexcel GCE
Music Technology (9MT0)
Paper 04: Producing and Analysing

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Summer 2019
Publications Code 9MT0_04_1906_ER

All questions reflected a full range of responses. Paper totals commonly ranged from 20 to over 90, with even lower and higher marks too, reflecting a well-judged assessment

Candidates should be reminded not to give answers that contradict themselves, or a string of guesses. Contradicting answers won't be credited in any question. For example, in 4(a)(i) some candidates, replied, "autotune / pitchshift"; although "autotune" is correct there is a wrong answer present too.

Some candidates do not provide correct bounces so they could not access all of the marks because the work cannot be fully assessed. Examples include: not soloing the track, leaving the metronome on, question 5 only bouncing bar 34-35. Also, candidates should not have the processes for question 5 (e.g. reverb, side-chain gating) on the bounces for questions 1-4, otherwise the effects could mask what is being assessed; this year candidates who had a loud long delay in question 5(b) in question 2(c) could not be fully credited for 2(c).

Most centres were well prepared for the examination. However there continue to be similar problems to previous years:

- Some were damaged in the post, so please wrap them carefully.
- Exams officers did not put the CDs in with the papers, or sent them separately to a different address.
- Missing word processor cover sheets.
- Please don't put sticky labels on the CDs because they damage the fragile CD drives in laptops with which this paper is marked.
- Technicians muddled up the files on the CD: although the CD was correctly labelled in pen, it had the wrong candidate's work on it. Teachers/technicians must take care that the work on the CD is the candidate's work.
- The CDs should be data CDs, not audio CDs. By using data CDs, the candidate's number is saved in the filename so reduces the risk of the previous point.
- There shouldn't be anything on the CD other than the required bounce wav files. Some centres include project files or contradicting unlabelled audio files making the correct file hard to locate.

During the exam, computers must not have access to the internet, any other network or previously saved files. Refer to the "Administrative Support Guide" on the Pearson website. This year there were instances of candidates that had inadvertently submitted music from previous exam series (usually the MIDI part) proving to Pearson that their exam computers were not secure. This is treated as malpractice by the centre.

As technology progresses, examiners are as keen as the centres to discontinue the use of CDs for submission. However, because there is a paper copy of the script there needs to be a hard copy of the audio to accompany the script. Also the large file size of uncompressed audio presents challenges of upload/download time. CDs also have advantages over USB sticks: they are cheaper and are ROM so can't be altered. Pearson cannot accept one USB stick per centre because every candidate needs to be self-contained for the various processes during the examining season: pre-standardisation, standardisation, marking, sampling of marking, awarding grade boundaries, Enquiries About Results.

Question 1

This question was intended to be a series of short answer accessible questions to ease the candidates into the exam. These gradually got harder throughout question 1.

(a)(i) Generally answered correctly, the most common incorrect answer was "feedback" or "fuzz".
(ii) The question asked for ways this noise could have been avoided *whilst recording*. Most candidates replied with processing solutions, such as gating, so failed to score. The most common correct answers were DI box and balanced cable.

(b)(i) Most candidates understood the concept of a noise gate, but also many confused the process with limiting, compressing or filtering. Some gave vague answers which couldn't be credited such as, "The threshold is the point at which the gate is activated." There is no information about above or below, and it doesn't say what a gate actually does: reduce/cut noise. Some gave confused answers, describing a filter by misusing the word frequency, "Below the threshold the frequencies are cut" therefore no credit could be given; or "reduces the velocity" instead of reduces volume.
(ii) Few candidates achieved both marks because the answer required a link between the loud noise and cutting the bass by accident.

(c) Very few students scored full marks for this section of the paper because they didn't set the threshold carefully to remove the noise but leave the bass intact. Commonly, the noise was cut in bars 2-3 but with very little further gating (may be just the odd cut) scoring only 1 mark. Full marks were rare so this question differentiated across all grades.

(d) This question targeted U-D grades, so it was mostly answered correctly.

(e) This question should have been very straightforward for candidates; candidates found it harder than expected so it differentiated well across all of the grades. The scaffolded question stated that audio from bar 41 should be used which was the bass with correct pitch and rhythm; it just needed to be copy and pasted and cross-faded to avoid clicks. Many gained the rhythm mark but mis-pitched the audio, either with the wrong pitches in bar 41 copied or with excessive automatic re-tuning with slow response times giving very bendy pitch. Very few candidates scored 5 having the correct pitch and rhythm and removing all clicks including the click on 44:1.

Question 2

Question 2 tested the candidates' knowledge and understanding of MIDI sequencing.

(a) Generally very well answered, many candidates obtained 4 marks, perhaps showing that students had utilised the 9MT0/04 Sample Assessment Material and had been well prepared for the new technical numeracy part of the specification. A surprising number of candidates re-wrote out the given example which examiners didn't credit.

(b) Candidates should have a thorough knowledge of their DAW, knowing which editor is the most appropriate for tasks. This question required candidates to use the list editor to find specific data. Surprisingly few students obtained the 3 marks available.

(c) Candidates needed to assign the correct sound to the MIDI rhythm. Most candidates did well on this, especially the crash cymbal. Common mistakes were swapping the kick and

snare. This task was particularly good at differentiating students who not only understood the underlying technology, but also practical contextualisation of the music as a whole.

Question 3

(a) Many candidates mislabelled the graph axes, where many had mistaken time for frequency on the x-axis, mirroring their similar confusion of amplitude and frequency in 1(b)(i).

(b) Very few students gained 2 marks for a correct distorted waveform. Most obtained 1 mark for squaring off at differing levels rather like a bit-crusher.

(c) About a third of candidates correctly understood that it reduced the dynamic range; another third thought the dynamic range had increased, showing a lack of awareness of the difference between gain and dynamic range. The remainder of candidates didn't even talk about dynamic range, but discussed frequency content or a general increase in gain.

Question 4

(a) This question required candidates to understand what an artefact is and to identify a plugin that may have caused the artefact in the audio on the question paper.
(i) Many candidates correctly identified some kind of automatic tuning as the processor used. Some guessed, e.g. compression or distortion.

(ii) Many candidates replied with phrases such as simply unwanted noise, scoring 0. Some discussed noise that arose as a result of capture rather than digital processing, again scoring 0. Some students wrote accurately detailing how audio artefacts occurred in digital processing, showing an in-depth understanding of digital audio and processing.

(b) This question required candidates to recall their own recording practice as part of 9MT0/01, along with their knowledge of recording theory to consider how to reduce headphone spill during recording.

Many candidates demonstrated a good understanding by suggesting that the volume of the headphones should be turned down, or that closed-back headphones should be used. However, candidates often suffered from a lack of detail, with a significant number having the correct idea by suggesting that the volume should be turned down, but without specifying which volume (i.e. headphones); there are many volume controls in the studio! Other relatively common but incorrect answers discussed turning down the gain or moving the singer further away, which wouldn't have solved the problem and would have made it worse by introducing more noise. Similarly to 1(b)(i), some candidates were writing about processes they could use post-recording rather than during recording such as gating.

(c)(i) This question required candidates to consider the waveform that is most similar to that of the human voice singing "ooooh". They could also see the answer to this question by viewing the waveform on screen.

(ii) Technical numeracy is a new aspect of the 2018 specification that was introduced following feedback during re-development from universities. Candidates had to perform a simple calculation to work out the frequency of the note an octave above that they were given. The wide majority of candidates understood that to go an octave higher, the frequency is doubled. Some candidates made life more difficult for themselves by using an EQ analyser to try and find the correct frequency so didn't get the exact figure; or by adding 12 (presumably semitones) to 294Hz. Some candidates wrote the correct working but didn't correctly multiply by 2 so only scored 1 mark.

(d) Another new requirement for the new 9MT0/04 paper is that candidates will create an extra part from some other material given on the exam CD, or from another part. In this case, candidates had to create a backing vocal part from a long sample of a single note, requiring truncating, retuning, and then panning. This question was 9 marks (so a huge percentage) to reflect that this task is time consuming with many steps required.

The wide majority of candidate responses to this question were mostly successful. The inclusion of a piano roll grid meant that most of candidates were able to correctly tune the sample to the correct pitches. There were a variety of different approaches to this, but there was no single correct way of doing so. Some candidates didn't correctly pitch all of the notes so didn't score 4 marks for pitch.

For the further five marks, common errors included incorrect rhythm often missing the repeated notes and gap at the end of bar 37. Whilst candidates can approach the question in whichever way they want – whether mapping to a sampler instrument or copying and arranging small segments of audio in the arrange window, they should be aware of the need to edit audio precisely and carefully using fades where necessary to avoid clicks. Some candidates did not pan the different vocal parts.

Many candidates only submitted a short bounce of bars 36-43 without the lead vocal. On this occasion, examiners were able to fully assess such bounces that didn't show synchronisation; any synchronisation issues could be assessed separately in question 5(g). However, in future this may not always be the case. Candidates should bounce all bars (including blank bars) for questions 1-4.

(e) This extended response question is a new feature of the 9MT0/04 paper compared to the previous 6MT04 paper. Both AO3 and AO4 are assessed in this question, so there must be evaluation to access the 4 AO4 marks.

This year this question required candidates to interpret some graphical information about a microphone.

Candidates who just memorised information from revision without understanding it could not score very highly in this question because it was designed to test higher levels of understanding: candidates not only had to recall and use technical vocabulary associated with microphones, but interpret the unfamiliar data given in the technical specifications, then evaluate the suitability of this microphone for vocal recording.

Some candidates seemed slightly confused as to what they were looking at, referring to EQ applied to the microphone rather than the frequency response of the microphone itself. Some candidates discussed the general characteristics of vocal or condenser microphones extensively but without referring to the diagrams so couldn't score many, if any, marks.

Candidates who evaluated the effect of the frequency response and polar pattern diagrams demonstrated higher order thinking skills (AO4) gained more credit.

Most students correctly identified the cardioid response (although the wide majority spelt it as 'cardiod [sic]'). Candidates who extended their answer to discuss room rejection/ambience scored an additional AO4 mark.

I was pleased to see that many candidates intuitively recognised the proximity effect shown in the nearfield frequency response; such students were rewarded with AO4 marks especially if they went on to discuss problems associated with proximity effect.

Only a handful of candidates knew what the 'tolerance' was. Many candidates incorrectly discussed how tolerant the microphone was at loud sound sources and how it didn't matter because vocals weren't very loud.

This question differentiated across the grades well. E-grade students typically scored 2 marks for something like, "Cardioid picks up from the front and sides." A-grade candidates usually scored 7-8 marks for intuitive understanding of the two frequency responses.

Question 5

This question had a range of editing, processing and effects-based tasks to cater for a wide range of candidate ability. Although all questions differentiated across the grade range, they were targeted at different ability levels. Questions (a) & (c) were targeted at E/D candidates, (b) was targeted a little higher, (d) was aimed at the A candidates, and (e), (f) and (g) were across the whole range.

Candidates should answer the questions and not add other creative panning, dynamic processing, EQ and effects not specified in the question. Otherwise full credit may not be given because the processing that the question asks for may not be clearly audible.

(a) The majority of candidates were successful in adding the amount/length of reverb to suit the style. Some candidates were too dry, not fully answering the question to match the vocal reverb amount with the very reverberant electric guitar.

(b) This task was mostly successfully completed. However some were not bold enough to make the mix high enough to make it a mix feature as was given in the example.

(c) The majority of candidates did this well with mono tremolo, the triplet quaver feel and correct depth. Some mistakes include using some form of chorus effect which maybe was the first modulation effect that comes to mind for most candidates.

(d) Because this question was targeted at the higher grades, many candidates did not attempt it. A common error was an incorrect threshold leading to incorrect rhythms or a lack of rests. Sometimes the reverb was gated as well as the vocal, proving that the candidate hadn't used an aux for the reverb in 5(a), or had the inserts in the wrong order, so only scored 2 out of 3. However the best candidates gated the vocal musically and scored full marks.

(e) This was quite an involved task requiring several steps, including making two distinct signals. It was intended to target the higher grades and I was surprised to see how well candidates completed it. However the task still differentiated across the grades: E-grade candidates scored 1 or 2 because there weren't two separate signals in different pan positions. A-grade candidates musically created the panned, pitch-shifted distortion and blended it seamlessly into bar 43 with no clearly audible join or change of tone.

Unfortunately, a common issue was missing bar 42, stopping the bass distortion at the beginning of bar 42 instead of seamlessly blending it in with bar 43.

Examiners understand that the panning asked for in the question was not what would be found on a commercial recording. However by panning the candidate's distorted bass hard left, examiners could isolate the distorted bass on their DAW (using phase cancellation) making assessment more reliable.

(f) The stems are deliberately mastered at wildly varying volumes to ensure that the candidate needed to listen (rather than look at fader positions) to earn credit. The best candidates that used their ears to balance all five parts achieved full marks. Many

candidates had a tendency to leave the bass and backing vocals too loud as on the original CD.

(g) A great deal of candidates did not take care with the ends of the tracks cutting tails of cymbals or guitar reverb off without fading or waiting until silence; a familiar trend in coursework too. Too commonly, the MIDI drums were a bar early.

In some centres, all candidates had a random blip of other audio at the end of the question 5 bounce. Centres need to check their software so they are not disadvantaging their candidates.

Question 6

An old analogue synthesiser was used as the stimulus, rather than a DAW plug-in, because it's unlikely that candidates would have used this particular model, so no candidates are advantaged or disadvantaged depending on what DAW they use. In this question, all of the controls on the Juno 6 should have been familiar because they have DAW equivalents.

This question was designed to differentiate across all of the grades, including A*. E grade students tended to score 3-4 marks. Only A* students showed an intuitive understanding and scored more than 15 marks. Similarly to 4(e), candidates are expected to apply their knowledge to an unfamiliar diagram/picture and extrapolate how it would sound.

The vast majority of candidates were able to score some AO3 credit by naming features of the synthesiser such as the envelope and high pass filter. Most were also able to identify parameters such as the resonance, and were aware that the sub-oscillator was a square wave.

AO4 marks were awarded for describing the impact of the parameters on the sound, and the suitability of this sound for a synth pad. The most common AO4 discussion was about the envelope stages (attack, decay, sustain and release) and were able to articulate to what extent these settings would be appropriate for a synth pad. However, only the top performing candidates noticed that the envelope parameters were routed to the filter cutoff and not the amplitude. Next most commonly for AO4 credit was description of chorus on the pad sound.

Several candidates confused synthesiser parameters with audio effects, for example, confusing the VCA gate (disabling the envelope) with a noise gate designed to cut out background noise, and the delay time on the LFO, with a delay effect built into the synthesiser. There were a surprising number of candidates who thought that the LFO was for audible bass, rather than a control signal.

Very few candidates spotted the DCO and were able to discuss the benefits that this would have over a VCO. Very few candidates were able to identify and explain the importance of the pulse width modulation to add movement to the pad; many candidates thought that this was a square wave and did not appreciate that the pulse width was being modulated by the LFO.

Very few candidates identified the filter as a low pass filter. This is surprising, considering it is such a key parameter of the synthesiser. Candidates who understood that the resonant

low pass filter cutoff frequency was being controlled by the envelope could receive a lot of credit showing their understanding of the interaction between the different sections of a synthesiser.

One or two candidates were determined to let examiners know how much synthesiser revision they had done giving detailed pages about the history of synthesisers and pop music in the 1980s. Such responses received little credit because they weren't answering the question.

Centres are reminded that this question is different to that of the 6MT04 paper. Candidates that had prepared for this exam by completing past 6MT04 papers tended to max out at 5 AO3 marks (without any AO4 marks); they listed the parameters of the synthesiser and their function, but did not describe the impact on the sound, or evaluate the suitability of this sound for a synth pad.

Some candidates annotated the picture of the synthesiser. However, these answers tended to only contain AO3 credit because there was no further evaluation of the parameters.

Several students wasted time and space by writing lengthy introductions without any creditable content, or restating previous points in conclusion paragraphs. Candidates are reminded to keep their responses concise and factual.

The most successful candidates were precise with their use of technical vocabulary, and were able to demonstrate an impressive depth of knowledge, often receiving a lot of credit for a single, well-constructed sentence.