

SCHOOL OF JOURNALISM AND DIGITAL COMMUNICATIONS

TE1071 AUDIO PRODUCTION OF TELEPHONE SPEECH ASSIGNMENT REPORT

Assignment... Produce a two minute audio piece using a mixing desk to simulate the sound effects of a telephone conversation. Student should effectively set up equipment and demonstrate an understanding of channel settings on a mixing desk.

Scenario... The two people in the room are having a conversation whilst a small “transistor” radio is playing music. Half way through the conversation the telephone rings and a short conversation between one of the people and caller follows. The scene ends.

Introduction... My task was to reproduce the scenario described above using the knowledge and experience of mixing desks I learnt in classroom workshops. The ‘floor plan’ diagram below outlines the layout of the scene to be recreated including position of people involved, telephone, radio and recording device.

Actors...

- First speaker – Zainb Katham
- Second speaker – Heather List
- Phone voice – Heather List

Script...

Zainb/ what are you doing for Christmas

Heather/ I’m going to have a nice quiet Christmas all by myself

Zainb/ What about your kids

Heather/ I will see them Christmas eve but I’m looking forward to a Christmas day of peace and quiet, no one moaning about their gifts, no one complaining their sprouts are soggy

Zainb/ Oh Ok

Heather/ what about you what have you planned

Zainb/ well I am going to Cardiff to see my family for Christmas

Heather/ Cardiff that will be nice how will you be getting there?

Zainb/ I will drive down with my husband on Christmas Eve

Heather/ well I hope we don’t get any bad weather like last year, will you be having an English Christmas dinner

Zainb/ no I will be helping my family cook a traditional Afghanistan food, like Dolma and lots of stuff.

- Phone rings

- Zainb answers it

Zainb/ Hello

Cousin / Hi love hope I did not catch you at a bad time

Zainb/ no it’s ok just having a coffee with my uni friend

Cousin/ well I’m calling about Christmas Eve

Zainb/ Oh

Cousin/ yes you know how you were going to pick us up around 2 o’clock

Zainb/ yes

Cousin/ well can you make it an hour later around three instead

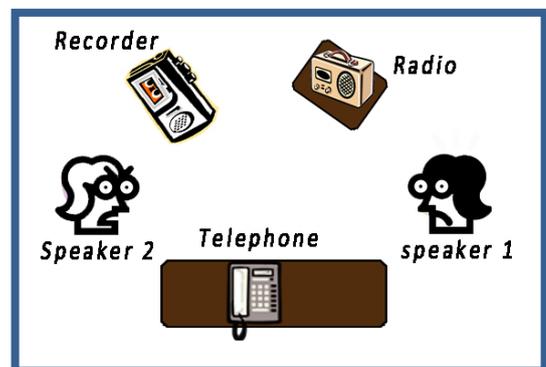
Zainb/ Sure no problem is there anything wrong

Cousin/ No it’s just Ridha has got the part of Joseph in his school nativity and they are putting on an extra performance for the local OAP home on Christmas Eve so we won’t be ready to leave till 2 o’clock

Zainb/ OH that is terrific hope he has fun and it’s no problem

Cousin/ that’s great see you on the twenty fourth bye now

Zainb/ Bye



Equipment...

Mixing Desk – Soundcraft, Spirit Fold

2 microphones – Shure SM58 vocal microphones

Audio Device (for radio effect) – Sony NWZ-E474 Walkman E Series MP3 Player

Telephone (for ringing noise) – mobile phone picked up via microphone

Headphones – Generic stereo headphones

Digital Portable Recorder – Marantz Professional + 2GB SD card

Various Leads –

- 2x XLR Cables for microphones
- 3.5mm stereo jack to 2x ¼ inch mono jack lead for Marantz Recorder
- 3.5mm stereo jack to 2x ¼ inch mono jack lead for mp3 player
- Jack to jack lead ¼ stereo for Aux setup

Report...

➤ Method

After agreeing on what equipment we required Zainb and I collected the apparatus from our tutor then laid it out to make sure we had everything necessary to set up our mixer desk for the assignment. (Fig 1)

To this we added my Mp3 player for the background radio sound and Zainb's phone for the ring tone effect and we utilised her headphones.



After plugging in the mixer desk we reset the dials to their balanced settings then connect the two Shure SM58 microphones with the XLR cables. (Fig 2) We then attached the headphones with a 3.55mm to ¼ inch jack adapter and tested the sound levels of each microphone.



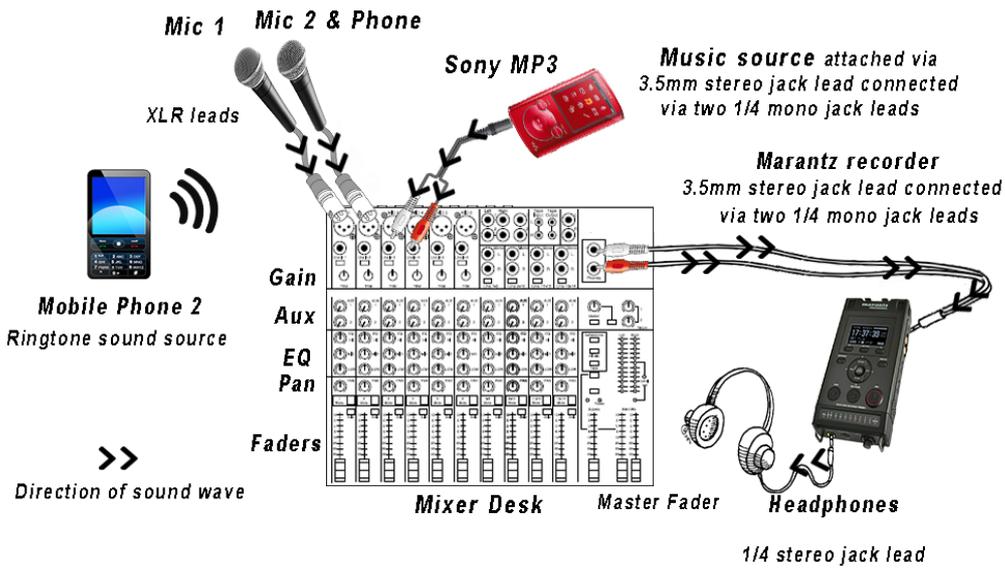
Our next step was to connect the Marantz recorder and change its setting so we had a stereo input and were recording as an uncompressed wav file (PCM-16) with a good 48k sample rate for sound quality. We then inserted the SD card and tested the sound levels for a recording. Unfortunately at this point two things were acting against us and we had no sound levels on the Marantz and nothing coming through the headphones. Our first mistake was the line in settings on the Marantz we forgot to change it from MIC/LINE to LINE2, this was crucial as we were connecting the mixer desk to the Marantz not a microphone. (Fig 3 / 4) Our second stumbling block was our unfamiliarity with the mixer desk itself, a button labelled 'TAPE RETN' needed to be pressed for the mixer desk to send sound out to the recording device. (Fig 5) However once these were taken care of we had sound and were able to adjust the gain levels and pan settings according to our floor plan prerequisites.



Our final piece of equipment to attach and check was the MP3 player; this had a radio feature so we used this instead of the music player. (Fig 6) We needed to adjust the gain level for the sound coming into the mixer so it was low but clear and then the fader so that the sound going out to the recorder was lower still so it sounded like it was in the background. In the floor plan the radio is to the right so we turned the pan setting to the far right. We also adjusted the mid and low eq to create a transistor radio effect.

We discussed routing the microphone to be used for the telephone conversation through an auxiliary channel to make it sound more distant as it would on a standard landline. However neither Zainb nor I could remember exactly how to replicate the settings we had used in a previous class test and we didn't have any notes with us. In the end we decided to try and replicate the sound effect by changing the gain, eq and pan settings of the microphone; this required some quick changes whilst the phone ring tone was played as we only had two mics and so could not have one preset.

Finally before we did a live run through; we checked the sound levels for each effect and the recording levels on the Marantz.

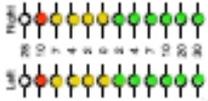
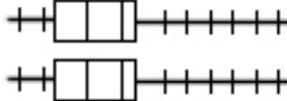


➤ Photograph of Layout



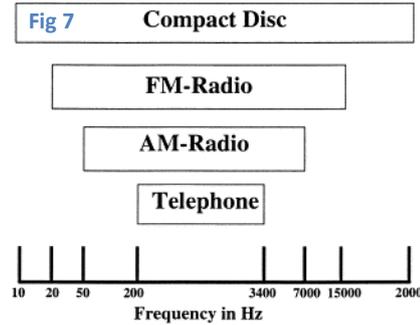
➤ Summary table

	Mic 1		Mic 2		Mic 3 /Phone		Radio effect		
Gain		Boosted		Gain Boosted		Balanced			Gain Boosted
High Eq		Balanced		Balanced		Balanced			Balanced
Mid Eq		Balanced		Balanced		Boosted			Boosted
Low Eq		Balanced		Balanced		Filtered max			Filtered
Pan		Adjusted left		Adjusted far right		Adjusted right			Adjusted far right
Faders		Level boosted to max		Level boosted to max		Level kept low			Levels kept low

<p>Master Fader</p>			<p>Levels boosted but clipping maintained</p>
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➤ Mixer settings

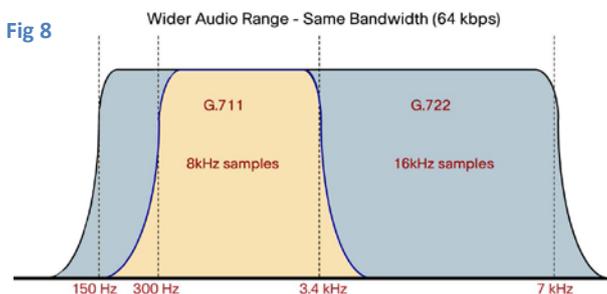
The audio frequency (AF) range of the human hearing which is often referred to as the acoustics levels is between 20Hz and 16,000Hz. The audio frequency range of a standard landline telephone however is only roughly 200 Hz to 3000 Hz. A basic fm radio does not broadcast much beyond the boundaries of 15.000Hz and is lost below 50Hz unless you are using military strength receivers. Fig 7 shows a diagram example of this and was sourced from an article by Candace Kamm, Marilyn Walker, and Lawrence Rabiner. (1997), *Plot of speech and audio frequency bands for telephone, AM-radio, FM-radio, and compact disc audio signals.*



To replicate these confined frequency levels for our assignment we had to limit our lower eq levels and boost the mid eq levels. We chose to leave our high eq levels balanced as this had worked in a previous test. This effect of cutting off the lower and higher frequencies but boosting the midrange ones allowed the replication of the tinny distant sound of an old style landline telephone and a low band broadcast of a transistor radio.

For the telephone we boosted the gain only slightly as we were after a background effect we also kept the faders low to assist with the output level passing to the recorder. By filtering the low eq frequencies to the maximum we cut off any of the low range acoustic sounds and with the midrange boost we squeezed the wave lengths getting through to change the pitch and make it sound old style. In addition to these settings it was our intention to pass the telephone mic input through an aux channel on the mixer. This would have further reduced the quality of the sound waves passing through the mixer to the Marantz recorder and made them sound even more distorted. Conversely though having successfully carried out this procedure in a previous workshop experiment neither Zainb nor I were able to replicate the effect with more than one sound input entering the mixer desk.

The reason landline telephones as we now call them sound so distorted is because when an analogue signal is changed to a digital one for transmission it is sampled using the *Nyquist theorem of 8bits per second. However modern high definition mobile phones have a much higher frequency range than landlines due to new technology that can double the normal sampling rate. As you can see in Fig 8 sourced from a Cisco systems white paper, this is why we receive much a much more audible signal over our modern mobile phones.



*The Nyquist theorem: States that to sample an analogue waveform and reproduce it digitally without error it should be sampled at regular intervals twice the highest frequency; for the human voice this was set at 8bits per second

Because radio signals are also limited to defined frequencies when reproducing this sound effect we adjusted the eq settings similar to those of the telephone however did not restrict the lower eq frequencies to the same extent. This was because radio frequencies have a much broader bandwidth and therefore a higher frequency range than a telephone. (See Fig7)

The eq settings of microphones one and two for the first part of the conversation were left balanced as we did not wish for these to be affected. Nevertheless we did boost the gain levels so that the voices could be heard clearly over the radio music and panned them slightly to the left for mic 1 and far right for mic2

as in line with the floor plan. Panning the sound left or right changes how much sound comes from each side of the stereo mix. The purpose of this was to make the voices when recorded appear as if they were coming from different geographical locations within the room.

To ensure the sound levels passing to the recorder were sufficiently audible we pushed the faders on the mic inputs all the way up then controlled the clipping with the master faders keeping the levels within the yellow marker lights.

This would prevent our voices from becoming warped or creating feedback. Incidentally this clipping or inability to digitise sounds above a certain frequency is why shouting down a telephone line in order for someone to hear you more clearly can have the opposite effect.

➤ Opinion

The end product i.e. the two minute recording went very well; there was a slight stumble while I changed the microphone settings however I think we suitably bluffed our way through that. Upon reflection it would probably have been more efficient to set up a separate channel with the setting already in place and just transferred the microphone. The assignment was supposed to be completed by groups of three or four students allowing for different voices and an extra pair of hands. Unfortunately there were not enough students in the class to make up the required group numbers so Zainb and I had to perform on our own with myself doubling as the voice on the phone.

I am not sure the effects we were trying to achieve were very successful it was not clear in the recording that the two people talking were on opposite sides of the recorder; however you can differentiate between the stand alone microphone voices and the sound of the telephone voice. When we reviewed the recording via the Marantz through the headphones it sounded very loud and clear however when I later played it back on my laptop via windows media it was hard to hear anything. I believe this is because we neglected to check the recording levels of the Marantz as compared to the output levels of the headphones.

Due to the lack of separate recording rooms three groups of students mine included had to set up our equipment within the classroom. I do not believe this was an appropriate place to perform this assignment partly due to the nervousness of my partner and acoustic environment of the large room. The sound of the telephone ringtone for instance was extremely muted and wasn't picked up very well by the microphone even though it was quite loud. In retrospect this could have been due to the proximity of the phone to the microphone and the fact that the SM58 is an Omni-directional mic and does not pick up sounds from the sides and rear. I feel thought the sound quality could have been improved if we had been in a smaller project room where the acoustics would not have been quite so lost.

Zainb is a very efficient student considering that English is not her first language and she was a very compliant partner. However I feel that I that her compliance meant that I did not truly experience working in a team and felt that I was not challenged on this level. Organisation wise I think everything went well and within the time we were allotted. We were even able to lend our personal equipment to another group to assist them in retrieving their files from the Marantz recorder SD cards.

We recorded the whole scripted conversation in one take using with no dubbing or breaks. The equipment provided was adequate for the task and the EQ modifications worked quite effectively. Conversely in a modern recording studio with sophisticated software this recording would have been split up recorded separately and then had post production effects added before being edited together to form one audio file. A dedicated mixer setup connected to a soundproof room with more powerful and directional microphones would also have improved the overall quality.

Conclusion...

Hindsight is brilliant when it comes to conclusions and with that in mind I believe a little more research on my part might have prepared me better for this assignment. Having said that I think Zainb and I successfully accomplished the aims of the assignment in producing a two minute recording in which we simulated a telephone conversation through the channels of a mixing desk.

References...

Fig 7/ Candace Kamm, Marilyn Walker, Lawrence Rabiner. (1997). The role of speech processing in human-computer intelligent communication. *Speech Communication*. 23 (issue 4), 263 - 278.

Fig 8/ Cisco Systems. (2007). *Wideband Audio and IP Telephony*. Available: http://www.cisco.com/en/US/prod/collateral/voicesw/ps6788/phones/ps379/ps8537/prod_white_paper0900aecd806fa57a.html. Last accessed 17th January 2013.

Block Diagram of Mixer Desk...

