

Chorus by Ray Lee:

Contemporary Music for Public Locations



Chorus is a monumental installation of giant metal tripods up to 5.5 meters in height with rotating arms. At the end of each arm a loudspeaker emits predetermined electronic tones creating a unique and compelling contemporary composition.

The fourteen tripods can be installed in a wide variety of outdoor locations from urban to rural or park setting. The tripods are arranged so that the audience are able to move freely between them. Audiences can be up to around a thousand people. The precise arrangement of tripods depends on the location being used. (see example layout from Newbury Market Square, overleaf)

Composition:

The composition varies in length from 23 to 29 minutes depending on the location and context for the presentation. In the 29 minute version (see score map opposite) there are eight sections of approximately 3-4 minutes in length. The work is pitched in concert A (in the scale of C Major) using a modal tonality that resolves into the Aeolian. Because the arms rotate at slightly different speeds a semi-random phasing of the pulses and drones is created.

Section 1: The tripods are static. A low drone, an octave pitched at a concert D (around 73 and 146 Hz) is replayed through static bass speakers in order to root the work harmonically, suggesting the Dorian mode. The first tripod’s sound is then activated. This is an intermittent short single note ‘beep’ with an interval of around 5 seconds between the notes. These beeps signify that the work has started, that the tripod sound is activated and are intended to build a sense of tension and anticipation among the audience. At this stage the tripod arms remain static. The sound from each subsequent tripod is activated in sequence with a gap of 15 seconds between each. The operators use stop watches to remain synchronised.

Section 2: At around 3’ 30” into the work the sound changes to a series of pulsed drones. As each subsequent tripod’s sound changes the motor driving the arm is activated and the operators use a speed controller to keep the rotation as slow as possible, around 4 rpm. Each tripod’s sound changes after 15” and the motor is activated until all of the tripods are in motion and moving slowly.

Section 3: At around 7’30” the sound changes again to static drones. The harmony is fairly open and avoids obvious dissonances. The operators increase the speed of rotation to medium, or half way, around 30 rpm.

Section 4: The speed of rotation is increased to fast, around 60 rpm. The pitch ranges used include higher frequencies. The bass drone changes to an F (approx. 87 Hz and 174 Hz) suggesting the Lydian mode.

Section 5: The speed remains fast, the sounds change to include some rapidly pulsed drones.

Section 6: The bass drone ‘resolves’ to A (55 Hz and 110 Hz) and roots the harmony in the Aeolian. The pitches include more dissonant intervals within the scale. The operators slow the speed of rotation to medium.

Section 7: The speed of rotation is reduced to minimum. The pitches move towards a resolution around concert A.



Photo: Nathan Cox

FREQUENCY IN Hz		Section → 1 2 3 4 5 6 7 8							
Tripod No.	TRACK No.	TRIPOD SPEED 'STATIC' 0 — 3:30"	'SLOW' 7:30"	'MEDIUM' 11:30"	'FAST' 15:30"	'FAST' 19:30"	'MEDIUM' 23:30"	'SLOW' 26:30"	'SLOW → STOP' 29'
1	1	1760	440 pulse	174.61	987.77	220 pulse	110	110 pulse	220
	2	1760 pulse	659.26 pulse	261.63	1760	246.94 pulse	164.81	164.81 pulse	440
2	3	1760	220 pulse	349.23	261.63	783.99 pulse	523.25	493.88 pulse	220
	4	1760 pulse	329.63 pulse	440	698.46	523.25 pulse	587.33	587.33 pulse	220
3	5	1760	440 pulse	440	220	659.26 pulse	659.26	783.99	440
	6	1760 pulse	392 pulse	659.26	329.63	783.99 pulse	698.46	880	659.26
4	7	1760	880 pulse	880	587.33	110 pulse	987.77	329.63	493.88
	8	1760 pulse	1046.50 pulse	1046	659.26	220 pulse	1318.51	493.88	523.25
5	9	1760	987.77 pulse	349.23	220	587.33 pulse	783.99	987.77 pulse	110
	10	1760 pulse	659.26 pulse	523.25	392	698.46 pulse	880	659.26 pulse	220
6	11	1760	261.63 pulse	523.25	220	293.66 pulse	587.33	261.63 pulse	400
	12	1760 pulse	293.66 pulse	783.99	440	440 pulse	880	293.66 pulse	493.88
7	13	1760	659.26 pulse	392	659.26	329.63 pulse	523.25	261.63 pulse	440
	14	1760 pulse	987.77 pulse	523.25	987.77	493.88 pulse	783.99	493.88 pulse	587.33
8	15	1975.53	349.23 pulse	440	987.77	987.77 pulse	880	783.99	246.94
	16	1975.53 pulse	523.25 pulse	523.25	1174.66	1318.51 pulse	987.77	987.77	440
9	17	1975.53	783.99 pulse	293.66	246.94	659.26	440	130.81 pulse	220
	18	1975.53 pulse	1174.66 pulse	440	293.66	698.46	783.99	196 pulse	440
10	19	1567.98	493.88 pulse	659.26	523.25	110	523.25	880	110
	20	1567.98 pulse	587.33 pulse	783.99	659.26	164.81	659.26	987.77	220
11	21	1975.53	220 pulse	987.77	698.46	440	783.99	1760	110
	22	1975.53 pulse	246.94 pulse	1318.51	880	523.25	987.77	1975.53	440
12	23	2093	110 pulse	1318.51	698.46	493.88	246.94	220	220
	24	2093 pulse	164.81 pulse	1975.53	783.99	659.26	293.66	392	892
13	25	1567.98	987.77 pulse	392	329.63	783.99	220	440	440
	26	1567.98 pulse	659.26 pulse	493.88	493.88	1174.66	440	659.26	659.26
14	27	2093	261.63 pulse	349.23	783.99	493.88	1396.91	220	220
	28	2093 pulse	293.66 pulse	523.25	1396.91	523.25	1760	220	220
BASS DRONE		146.83			174.61		55		
		73.42			87.31		110		(fade out)

'CHORUS' NEWBURY MARKET SQUARE APRIL 2011 — RAYLEE

Section 8: The speed remains slow. At 29’ each tripod is stopped as quickly as the operators can move between them. As the tripod stops moving the sound is stopped. The work ends.

Technical:

The work has been created and composed by Ray Lee. The tripods were designed by Ray Lee and built by Charlie Camm of Scenetec Ltd.

Chorus has been designed to be:

- Weatherproof. *Chorus* is located in outdoor sites and can be operated in all weather conditions.
- Battery powered. Each of the fourteen tripod units is self contained and powered by heavy duty batteries in order to avoid the necessity for mains power or trailing cables.
- Durable, tourable and safe. The piece is constructed from heavy duty aluminium which is dismantled into shorter sections making it tourable in a large van. The tripods have been designed to be safe in challenging weather conditions.

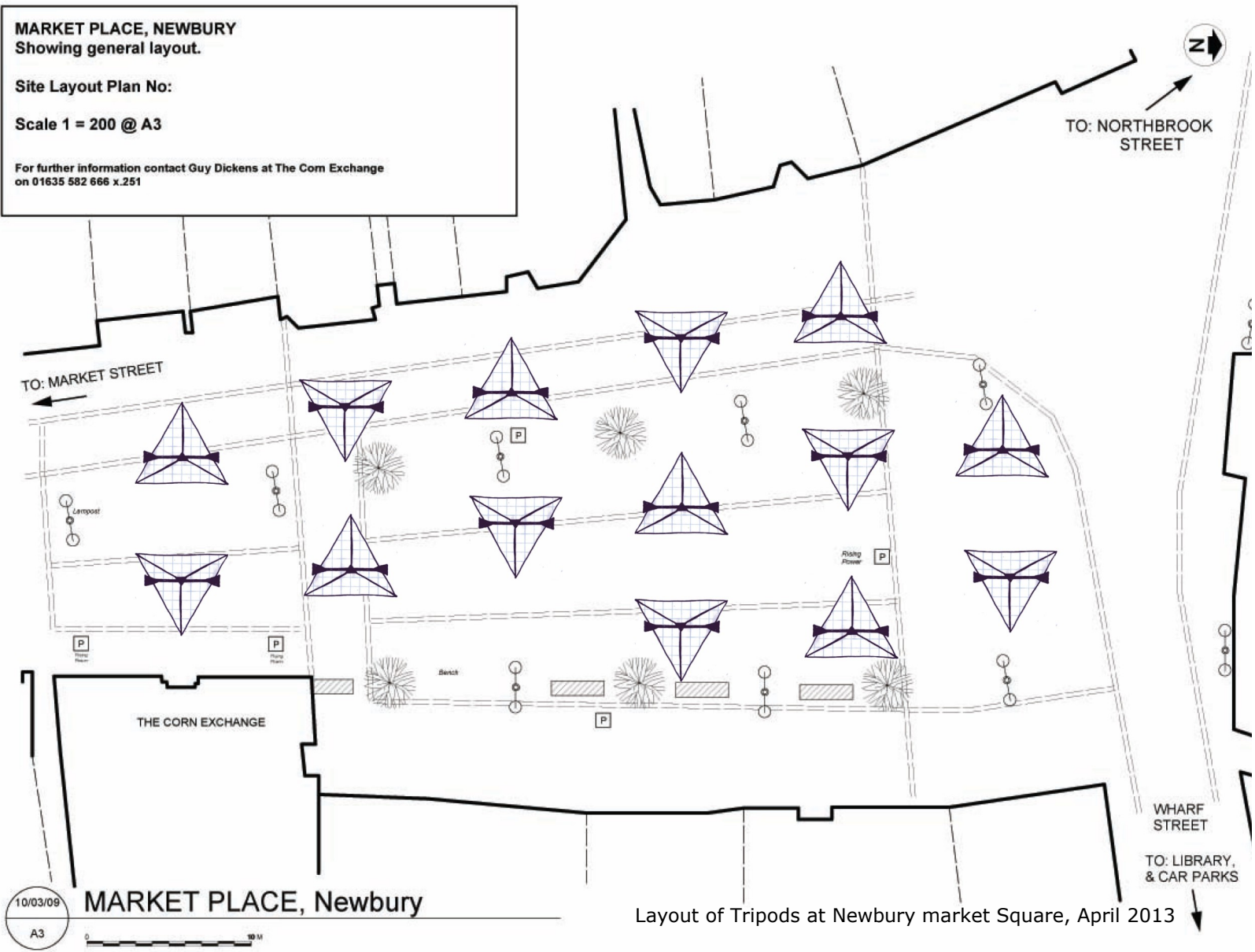
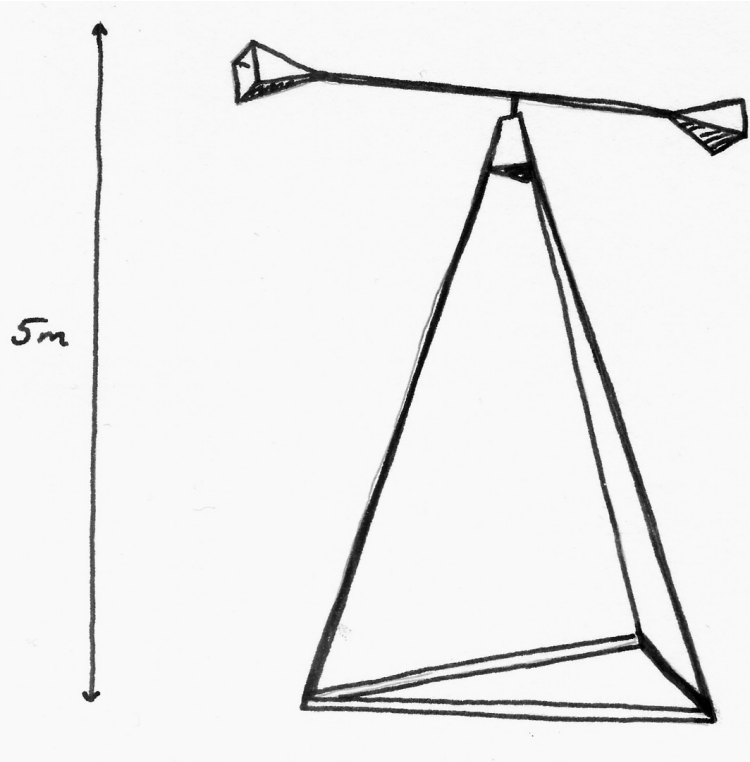
A high power motor drives the rotation of the arm. A single 10watt water resistant loudspeaker is housed at the end of each arm. An LED array at the end of each arm is powered directly by the sound output so if the sound pulses, the LEDs pulse.

The sound is recorded onto two-channel WAV players located at the base of the tripod. The sound for each channel is separate and each channel is amplified by a mono 30watt amplifier. The sound signal is transferred across the moving part using slip ring technology. Each tripod holds two channels of sound and together the fourteen tripods can replay a 28 channel composition.

A team of three operators activate the WAV players using a stop watch to synchronise the units, with each tripod sound being activated 15 seconds after the previous.

At the start of the composition the tripod arms are static and after the first section of approximately 3 minutes the arm rotation is activated.

The operators control the speed of the arm rotation using a speed controller on each tripod. The rotation speed is gradually increased and then decreased over the course of the composition.



Photos: Farrows Creative

