

**Observations on Hi-Res Seismic Acquisition System
SIVALIS/NEOMARGES Cruise
Vanuatu and New Caledonia
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In general the entire system worked quite well. We encountered a few snags that seem normal for an entirely new system, but once these were ironed out the system worked nearly flawlessly for the remainder of the cruise. We acquired and processed some 75,000 shots, over 500 km of 24-channel data.

I. Compressor

The Max-Air Mega-Max 6000 compressor in general worked quite well. The compressor was built with a 50-cycle electric motor to accommodate “European” power parameters, this motor will need to be swapped out for use with any power plant that generates 60-cycle power. The compressor frequently ran for an hour or more at a cycle, and occasionally ran for 3 or 4 hours without a rest. Oil pressure was commonly about 20 psi, dipping to 17 or 18 psi on very calm (hot) days. Ventilation (i.e. breeze if mounted outdoors) seems key to running temperature, especially if running for long cycles. When starting the compressor cold, leave the stage 4 bleed valve open until oil pressure drops to around 25 psi.

Issues before running again:

- Motor will need to be replaced
- New belts are possibly needed to accommodate new motor
- Belt tensioning bolts should be longer (for greater range of adjustment)
- Keep “Sticky Belt” and Corrosion Block on hand
- Check all O-rings
- Get set of spare O-rings for all valves
- Replace small corroded metal pipe



II. Receiver

High-pressure air was stored at 4000-5000 psi in the receiver. At 5000 psi, the compressor automatically shut off and receiver air was used to fire the gun. When receiver pressure dropped below 4000 psi the compressor automatically started up. Firing pressure was regulated down to 2000 psi regardless of receiver pressure. The 4 tanks are connected in parallel so that 1, 2, 3 or all 4 tanks can be used, effectively as one large reservoir. A small “manifold” was constructed, including a ball valve delivering air to the gun, a gun-pressure gauge, and a bleed valve. This manifold worked well, but showed some corrosion by the end of the project. We had considerable difficulty sealing the airgun initially, most likely due to all new seals, etc as well air flow restriction through the regulator. Adding a volume (small tank, coiled airhose) between the regulator and manifold should fix this problem. Once we fired the gun a few hundred times we had no problems sealing the gun.

Times observed:

Filling 4 tanks from 4000 to 5000 psi: 16 minutes

Firing @ 20 in³, 4.0 seconds, compressor off, 5000 to 2000 psi: about 50 minutes

- Add small tank or hose between regulator and ball valve
- Replace/refurbish ball valve manifold
- Purchase a couple of JIC-4 elbows
- Purchase wire and crimps for hoses/connections

III. Airgun

- Spare shuttle
- Few spare O-rings
- Disassemble/reassemble
- Some lighter chains
- Fire hose or anti-chafe



Bolt 600BT Airgun

IV. Firing system

- Get faster timer to allow faster than 3.5 second firing
- Get some kind of fire time logger.
- Get batteries/charger
- Waterproof connection for farther dropback
- Get proper fuses

V. Streamer

- Get more lead weights from Beam Systems
- Downrigger or planer?
- Better tail buoy that doesn't "swim"
- Some stretch in tail buoy rope
- Better bungy tow system

VI. Recording System

- Buy our own Geode
- Buy Marine Geode Software
- Make sure proper GPS shottimes get into headers

VII. Processing System

- Better screendump or .pdf path