

**Rotuma DXpedition November-December 2022**  
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(All photos by the author)

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After a lapse of almost two years, a DXpedition to Rotuma Island was implemented in late November 2022, being both for radio operation and attending to climate change (sea surface temperature) monitoring equipment setup at sea on the island since 2014. Preparations involved three full days of packing the necessary gear and power equipment, without any sleep on the last night in Suva.

Loading of the Government franchise inter-island vessel "Lomaiviti Princess 7" was completed by 0200 UTC on the 19th Nov 2022. Heavy cargo included a 200L drum of diesel fuel, four large plastic cases of radio and antenna gear, a 100Ah solar battery, 3 KVA diesel Generator and a 6m Cushcraft A50-5S antenna with an extended boom. The boat left the wharf at Suva at 0800 UTC on Saturday 19th Nov. 2022. The trip and seas were relatively calm, the ferry-type vessel heading north at a fast pace. The boat not really full of passengers, but heavy with cargo such as building materials, merchandise for shops on the island and vehicles.



Arriving at Oinafa, Rotuma Island, from the deck of the Lomaiviti Princess 7

We reached Oinafa Port, Rotuma at 1800 UTC on Sunday 20th Nov 2022 (6AM Monday 21st local time) just after local dawn. Unloading started at 2000 UTC, with enormous amounts of mostly commercial cargo, building materials, hardware and fuel drums mixed with passenger belongings. First some vehicles and large kinds of cargo were cleared from the ferry inner deck, and passenger items began to be cleared around 2200 UTC, on a trickle, each item being called out with the owner's name. It was an extremely excruciating process, as all passengers need to stand behind a fence on the hot ferry inner deck in heat well over 33°C and be ready to receive each item of belonging as it is called, needing to produce a receipt showing proof of payment of freight. My belongings having been stacked in disparate areas of the deck by the crew, it was not until 0400 UTC (or 5 hours of waiting standing around in the extreme heat amidst a mass of sweating humanity!) that all my cases of ham gear were reunited with each other and I could claim them. However the ordeal was not over since the 200L drum of diesel fuel was still not able to be unloaded from the boat, fuel being left to last to be removed from the deck. Finally, after much pleading with the deckhand, my drum was on the wharf by 0600 UTC Monday. It took another hour to find a truck willing to take us to the QTH in Fapufa village, some 14 Km to the west; however the 200L diesel drum was too heavy to take on this trip, so we had to leave it on the wharf overnight. We reached my new home at about 0800 UTC, and unloaded all the gear from the truck. Bath and dinner (no shower facilities for passengers on the boat!), and a well-deserved rest. The first task upon reaching the village was to visit the grave of my dearly missed son Rehanisi, spending some quiet time and putting some flowers in memory of his unexpected and tragic loss in January 2021. The picture on the tombstone might have faded under the harsh Rotuman sun, but never his memory in our heart.

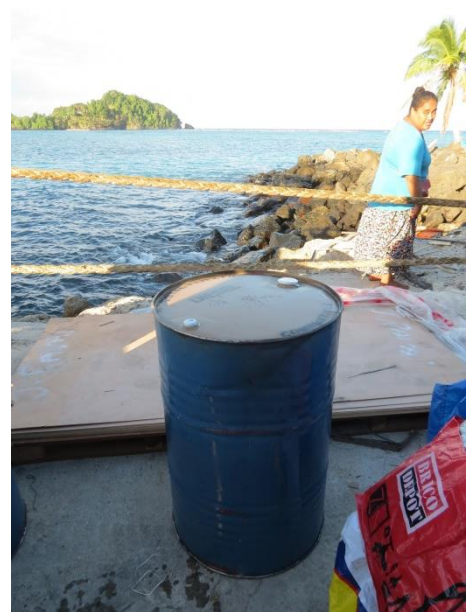


The chaos on the wharf at Rotuma during unloading of the cargo.  
Note the stack of empty fuel drums ready to be shipped back to Fiji for refilling.



The grave in Rotuma of our dearly-missed eldest son Rehanisi (2009-2020)

On the next morning, my host went back to the wharf area to try and bring back the fuel drum, since the boat I came in was returning to Fiji that day with passengers and lots of cargo (mainly dried coconuts and copra for sale in Fiji) which meant that there would be many trucks travelling to and from the wharf. Finally, by 0200 UTC on the 22nd of Nov. 2022, the diesel drum was dropped at the QTH in Fapufa.



Left: The Lomaiviti Princess 7 at Dusk berthed at Oinafa Wharf. Right: The 200L drum of diesel fuel (funded by the GDXF!) finally unloaded on the wharf, awaiting transportation to the QTH.

I had woken up at 5:30am local time that day, and spent most of it unpacking the gear and setting-up the operating table and station. By local nightfall (0600) on the 22nd of November, the station on its operating table was ready. From 1800 UTC on the 22nd of November to 0600 on the 23rd of November, the solar power system and 5-element 6m yagi antenna were setup. This would be a hybrid solar-/generator-powered DXpedition; the solar system consisted of a Solar World 160W panel linked to a Sun Saver 20A charge controller and two 100Ah/h deep-cycle solar batteries. A Sure Sine 100A AC-DC inverter was used to provide 240V mains power for charging the laptop and other such items as required. It was not turned on however during radio operation, since it generated quite a bit of RF noise, as all inverters usually do. My shack soon became very popular with the local village inhabitants, when they found out that they could charge their mobile phones using the solar system rather than walking some 3Km to the next village which had some limited generator power for a few hours a day.

Installation of the Cushcraft A50-5S 6m antenna took the good part of a day, first cleaning and assembling the directors, reflector and driven element, the extended boom made up of four separate pieces, and then assembling the elements on the boom with the correct spacing on the grass outside, once the sun was somewhat less hot. A 10m length of LMR-400 coaxial cable was connected to the antenna. By the time the antenna was ready for mounting on the mast (a 6m length of galvanized water pipe 40mm in diameter) it was already sunset, and my host told me that it was no longer possible to take out the mast from its storage place beneath a large mango tree, because it was the time that “the chickens went to sleep on the tree branches, and to make noise would scatter them about”! So we had to wait until dawn the next morning to do the work, having a short window before the implacable hot Rotuman sun would shine on us (fighting the heat being actually harder than doing the work!).



Left: The Cushcraft A50-5S 50 MHz yagi on its 6m galvanized pipe mast. Right: The horrific condition of the box in which the Spiderbeam had been stored!

We rested the 6m long pipe against the house, inserted the antenna at the top (a short piece of PVC tubing with a horizontal nail across being attached to the boom as a holder and bearing for Armstrong rotation) and then put the mast straight, guying it down with ropes. Now the 50 MHz station was ready and monitoring using the IC-706MKIIG radio and solar power, waiting for any opening to happen.



The operating station, with the ACOM 600S linear, IC-7300 and IC-706 radios, and PACTOR modem

On Friday 24th Nov 1800 UTC, I set out to begin assembling the 5-band Spiderbeam. To my horror I found out that its storage box had suffered an accident while I had been away since January 2021, being shredded and its contents scattered about by a dog looking to give birth under the bed where the antenna was stored. Fortunately, after much searching all the parts of the antenna were eventually found undamaged, even if they had been put away in separate boxes by the house owner (including the balun, found in a box containing various solar wiring junk!). Inside the house the temperature was 33° C, and the Spiderbeam assembly had to take place for several hours under the implacable hot sun in the open. Sunscreen and sun hat, with plenty hydration were mandatory under these conditions. Owing to the extreme heat, work could only be done in short stints. By 0600 UTC on 25th November, the Spiderbeam was all assembled and adjusted, fed with coax and ready to be put up on its telescopic mast at first daylight the next day. With some luck, it was hoped that the antenna would be ready and the generator wiring done by 0000 UTC on the 26th of November, in time for the CQWW CW contest; likely the first time in years that Rotuma would be activated in this

renowned international event. Unfortunately, it was not to be...Waking up long before dawn, my host and I prepared to put up the Spiderbeam on its mast; first we rolled heavy, full 200L diesel drum next to the spot where the mast would be, so that someone could stand on it to lift up the antenna boom on the top of the mast before raising it up. However the drum was not high enough, and with only one person lifting the boom up, it was not possible. We needed a step ladder, or at least another person to help, neither of which was available. At that point I wished I had a lighter aluminum mast or a Hex beam, but such equipment is very difficult to obtain in Fiji. Next I went to check the heavy-duty nylon fishing line that was put up a coconut tree on my last trip, hoping to use it to put up the 80m/40m/60m antennas to at least get me on the air quickly. Unfortunately the line had come off the top of the palm tree as leaves fell off during the intervening two years, and my host (being nearly 70 years old now) could not throw another line up the 15m high tree, and even less climb up the swaying palm tree! This is when a catapult of bow and arrow would have come in handy to shoot the line over the tree, but once again these are not locally available. The windward southern location of the QTH with high wave action and a steep beach made it impossible to setup any vertical antennas for low bands near the water. The only solution now was to wait for someone to come by the village to help erect the Spiderbeam.



Assembling the 6-band Spiderbeam under the hot Rotuman sun



The fully-assembled and mounted Spiderbeam antenna

By early afternoon of 26th Nov., in desperation, despite a worsening cellulitis leg infection due to the heat I walked down to the next village of Motusa (about 2 Km away) to seek some help in raising the Spiderbeam. A person I knew promised to drop with his son by around 0430 UTC; we waited until 0700 UTC but nobody came. Yet another day went by, and the CQWW had already begun, but here I was still off the air. On Sunday 27th November, in the afternoon a miracle happened, and a group of people came to help us raise the Spiderbeam! Finally, the operation could begin on HF that evening. Unfortunately, no 160m operation would be possible this trip, as being on my own and weak from my leg infection and medications taken, time was short and setting up and then taking down shortly thereafter the inverted-L antenna (and especially clearing a path for the horizontal wire) would have taken an excessive amount of time and be physically too challenging, many branches and vegetation having grown near the beach since the last operation in January 2021 (it had taken me a whole week back then to setup the 160m system, having to resort to cut down undergrowth, countless obstructing palm leaves and saw away thick tree branches!). For putting up wire antennas, having many coastal trees can be both a blessing and a curse! Perhaps on a next trip, (with a couple other operators to assist the OM who is not getting any younger), low bands operation would be possible. Meanwhile, I concentrated on a "high sunspot activity" version of the DXpedition with a focus on 20m to 10m, mostly on CW.

I next went to finish the AC wiring from the generator (about 25m away, at the back of the house near the family graveyard) to the shack, supporting the cable on various tree branches and the rafters of the house. The diesel fuel was drawn from the 200L drum using an aluminum hand pump, and stored in more manageable plastic 20L containers for filling the generator using a fuel funnel. In the extreme heat, the drum has to be protected from the sun to avoid internal condensation and water mixing with the fuel. Similarly, when removing the lids from the two holes on the top of the drum (one threaded for drawing the fuel, and the other for air intake) the drum needs to be at an angle (by placing for instance a 2x4 piece of timber or brick to prevent water collecting on the top of the drum to enter the holes and mix with the fuel. A solid 10mm in diameter and 1m long copper rod found in the sea (perhaps 80 years old!) was used as a perfect ground for the generator AC circuit.



The 3KVA Diesel generator located some distance away from the shack, to lessen the impact of the noise. Note the tarpaulin to keep the rain away, and the proximity of the village graveyard.



Meanwhile, nothing opened yet on 6m, whether beaming NA/A or JA...until the 27th of November at 0352 UTC, when JG1TSG was copied -16 on FT8 working ZL2OK. No QSO was possible then, and no other stations copied. Later in early December, there were good openings on 6m to VK/ZL and JA, but not to NA or SA, despite N5DG being decoded weakly a couple of times on FT8 while NA was full working into VK and ZL on the 3rd of December. By the 11th of December, no further openings had occurred on 6m and the antenna was taken down and packed away in anticipation for the return boat leaving Suva on the 14th of December.

The bands were extremely quiet, with the only man-made noise detected being from a neighboring house 50m away while its owner was using a brush cutter (2300 UTC on 24 Nov 2022; S7 noise on 6m with the IC-706MKIIG) and some heavy noise from the generator itself on 20m and 30m. The FT8 QSO rates were very bad; for some reason I was not being heard well, either on normal or special QRG, especially using multistream on MSHV using the IC-7300. There were lots of repeats, frustration and wasted time, so I avoided using the generator on FT8 to save on fuel. I tried several FT8 programs (MSHV, JTDX and WSJTx F/H), but it appeared that the issue was partly due to my very low noise levels allowing me to hear much better than I was being heard, explaining the disparity in signal reports, and my ACOM 600S linear which had no ALC control, hence power output on multistream FT8 was always very low. The FT8 operation, to put it mildly was a disaster, but seemed to work best using the IC-706 radio on solar power barefoot and with a maximum of three streams. The QSO rates were always higher on the main FT8 QRGs, despite announcing the special QRGs, where I could sometimes call for almost 30 minutes without any takers. By the 29th of November, 1000 FT8 QSOs and 1060 CW QSOs were in the log.



Operating 10m CW during a pileup with Europe; note the absence of any computer on the operating table during CW operation! "Wetware" only with pen and paper...

Water around the island was cut daily from 0600 UTC until 1900 UTC, due to a chronic lack of fuel on the island to operate the two main borehole pumps supplying the island. The tap water was very hard and untreated, so we relied on tank water from collected rainwater for drinking and cooking. There are no rivers or streams on Rotuma.

On the 7th of December, the OM went slowly by foot (3 Km) to the main Government station at Ahau to cast his early postal vote for the Fiji National Elections as well as see the doctor to get antibiotics for the leg infection (by then my foot was very swollen and painful), so the daytime operations were curtailed between 0000 and 0500 UTC. No 6m openings occurred that day, so fortunately not much was missed. In the evening, between 0700 to 1100 UTC there were massive long path openings to both West and East EU on 20m, 12m and 10m. The pattern on the higher bands appeared to be excellent openings to EU almost daily via the southern long path between 0600 to 1000 UTC (with some exceptionally strong signals on 10m!) and then shifting to the northern short path between 1100 to 1300 UTC, after which bands were mostly dead until around 1830 UTC to 2000 UTC when very good long path openings occurred to USA and EU/UK on 20m to 15m. These 180 deg. Changeover of paths in the late evenings meant that the OM had to swing the Spiderbeam manually in the dark often moonless Rotuman night (occasionally while it was raining). The operation involved a nylon fishing line tied to the back of the antenna, with the other hand tied to a piece of white coral stone, which had to be thrown over 10m high guy lines by torchlight (the white color of the coral made it easier to spot where the stone fell!). Once the desired direction was obtained using a compass, the end of the string was tied to a convenient palm tree trunk or other support.

News came to us that the return boat (Lomaiviti Princess 7) would leave Suva in Fiji at 6pm on the 14th of December, and anchor at Oinafa Wharf in Rotuma by 1800 UTC on the 15th of December, leaving again around 0600 on the 16th of December. Band conditions suddenly deteriorated on the 14th of December, with no 10m openings and the last QSO was made on 20m with ON7PQ at 1239 UTC. By 1900 UTC on the 14th, the Spiderbeam antenna was taken down and the entire station and power systems dismantled and packed away, an affair that took a whole day. By 2000 UTC on the 15th of December, all the gear was back in the four large plastic containers and waiting for the transport to take us to the wharf and loading of the boat. By the end of the DXpedition, 8,194 QSOs were in the log on FT8 and 6,350 QSOs on CW, bringing the total number of QSOs to 14,544. Since the OM always uses paper logs on CW (this is not negotiable!) the CW logs, once digitized, will be uploaded to ClubLog a couple of weeks after the DXpedition. As with all human modes, there are bound to be minor logging errors and any discrepancies can be addressed via email and checking the original logs. Many thanks and VY 73 to all that took the time to try and contact the 2022 3D2AG/p Rotuma DXpedition, and I hope that many OMs got the new mode/band slots or ATNO that they wanted, despite the challenges and limitations encountered.



On the verge of departing for the return trip by boat: Pita Aisake (brother of Aisea 3D2AA (sk) sitting next to the packed equipment crates and bags.



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