

# 2022 East Karakoram Expedition

**A report on the exploration and unclimbed peaks of the Rassa Glacier in  
the Indian East Karakoram**

**1<sup>st</sup> September – 1<sup>st</sup> October 2022**

**Derek R Buckle**

*(18 Hillfield Road, Redhill, Surrey, RH1 4AP; [derek@bucklefamily.com](mailto:derek@bucklefamily.com))*



**PK6365 (aka Dagarpheth Kangri) from Glacier 2**

**Sponsored by the Mount Everest Foundation, the Montane Alpine Club Climbing Fund,  
the Austrian Alpine Club (UK), the Fell and Rock Climbing Club and the British  
Mountaineering Council**

**Members:**

**Derek Buckle, Jamie Goodhart, Steve Humphries, Steve Kempley and Howard Pollitt**

**With thanks to Chewang Motup & Yangdu Gombu of Rimo Expeditions, Leh, Ladakh,  
India**

**Contents:**

Summary	page 3
Introduction	page 3
The Climbing Team	page 5
Support Staff & Administration	page 6
Itinerary	page 7
The journey to and from Base Camp in the Tirit Valley	page 7
Exploration of the Rassa Glacier	page 9
Future opportunities in the region	page 11
Conclusion	page 12
Income & Expenditure	page 13
Bibliography	page 13
Glossary	page 13
Maps	page 14
Sponsors	page 14
Appendix 1. Terrestrial and satellite maps	page 15
Appendix 2. Daily itinerary	page 16
Appendix 3. Coordinates and heights of key locations	page 19
Appendix 4. Weather	page 19
Appendix 5. Flora and fauna	page 20
Appendix 6. Geology and artifacts	page 20

**Copyright:**

The compilers of this report and the expedition members agree that any or all of this report may be copied for the purposes of private research. All photographs were taken by, and are the property of, team members.

**Summary:**

Between the 1st September and 1<sup>st</sup> October 2022 five members of the Alpine Club travelled to India intent on extending the exploration of the extensive Rassa Glacier region of the Nubra Valley and attempting the ascent of one or more of its many unclimbed 6,000m peaks. Flying *via* Delhi to Leh (3,500m) in Ladakh, they first spent four days acclimatising to the altitude before crossing the 5,370m Khardung La to the Nubra Valley. After spending a night near the village of Tirit, the team then began a three-day trek up the Tirit Phu to establish a base camp at 4,750m, a little beyond the summer pasture of Arganglas and close to the confluence of the Rassa and Phunangma glacial outflows. Having identified an optimised access to the lower Rassa Glacier, an advance base camp was subsequently established on a sandy depression in the moraine at 5,100m on 13<sup>th</sup> September. Further forays identified a suitable high camp on the glacier proper, at the foot of the unexplored second glacial spur at 5,500m. From this camp team members extensively reconnoitred this glacial spur and two members successfully made the first ascent of PK6365 (Dagarpheth Kangri) *via* the ESE Ridge at Alpine AD on the 20<sup>th</sup> September. Further exploration was precluded by the onset of bad weather, forcing a retreat to base camp and an earlier return to Leh.

**Introduction:**

The area to the north of Leh still offers considerable opportunities to the explorer and mountaineer, although its proximity to both Pakistan and Tibet (China) does make it a rather sensitive region. Indeed, travel beyond the Panamik hot springs is still highly restricted to non Ladakhis and there have been several aggressive Chinese incursions over recent years. Fortunately, the border is calm at present and there is little obvious threat to security. Nonetheless, permission to travel and climb further east can be a protracted and far from guaranteed affair. Despite this, the rewards for persistence are significant and permits to cross the Kardung La are easily obtained from the local office in Leh.

Having climbed in the Nubra Valley several times previously (in 2016<sup>1</sup> and 2017<sup>2</sup>) it was a relatively straightforward affair to update my search of the climbing literature and review the satellite images available on Google Earth, especially as I still had a strong desire to explore the remote sub valleys of the Rassa Glacier. In 2017 we thought that we could approach from the north via the Sumur Valley, but this proved to be difficult and objectively dangerous.<sup>2</sup> It was now fairly clear that we would have to approach from the Tirit Phu as we had in 2016 when we successfully climbed Lak Kangri (6,222m) and Thrung-ma Kangri (6,315m) from Glacial spur 1 (see Map 1). Although local herders have long accessed the Tirit Phu for summer grazing, most climbing parties appear to have their eyes on Nya Kangri, the prominent 6,480m snow peak visible to the north from Phonglas, which I believe has still to receive its first ascent. (NB. The height of 6,520m given on Map 1 is now known to be incorrect).

The first climbing party known to have visited the Tirit Phu was a joint Anglo-American-Indian party co-led by Harish Kapadia and Chris Bonington in 2001<sup>3</sup>. Their team was the first to go beyond the confluence of the Rassa and Phunangma glacial outflows, but they concentrated their efforts on climbing peaks bordering the more southerly Phunangma Glacier.<sup>3</sup> It was not until 2014 that an Indian party, led by Divyesh Muni, a member of the 2001 multinational team,

returned to explore the extensive Rassa Glacier to the north of the confluence.<sup>4</sup> It was their account, and subsequent private correspondence, that eventually convinced us to focus on the unclimbed 6,000m peaks forming the northern boundary of the first glacial spur of this glacier (Glacier 1 on Map 1 and Google Earth satellite image in Appendix 1).<sup>1</sup>

We now wished to extend our exploration to Glacier 2 in the hope of climbing one or more of the 6,000m peaks to the north of the glacier. PK6365 was our primary objective, but we hoped that PK6189 might also be a viable option.



Map 1. Map of the Rassa Glacier, courtesy of Divyesh Muni. The two peaks marked with red triangles (Rassa Kangri and Tusuhm Kangri) were climbed by Muni's team in 2014 and those circled in blue (PK6222 {Lak Kangri} and PK 6315 {Thrung-ma Kangri}) were climbed by our team in 2016. PK6365 (Dagarpheth Kangri), climbed by this 2022 Expedition, is circled in red. This peak was approached via Glacier 2. Note: Nya Kangri is incorrectly shown as 6,520m, rather than the accepted height of 6,480m.

## The Climbing Team:



competent ski-tourer.

**Derek Buckle**, 78, British; Retired Medicinal Chemist. AC member & past VP. Has extensive mountaineering experience throughout the world; notably Tibet, Greenland, Kyrgyzstan (Tien Shan), Tajikistan (Pamirs), Russia & Georgia (Caucasus), India (Garhwal, Himachal Pradesh, Zaskar), China, South America (Bolivia, Peru, Ecuador), Antarctica (Antarctic Peninsula) and numerous trips to the Alps. He has made over 60 mountain first ascents plus many first British ascents and new routes. Leads rock to 5a/5b, ice to WI4+, Mountaineering to TD and is a



**Jamie Goodhart**, 39, British, Doctor, AC member. Broad climbing experience, from the hills and crags of the Lake District and Scotland to the Greater Ranges. In 2013 he was member of a team visiting the Antarctic Peninsula where he made several first ascents, and has mountaineered in Central Asia up to 6,200m. He also has mountaineering experience in the Peruvian Andes and elsewhere, joining my expedition to the Indian Karakoram in 2017. He has Scottish winter, alpine and general expedition experience. As well as being medically qualified, he has specialist qualifications in mountain medicine.



**Steve Humphries**, 68, British, Retired Businessman, AC member. He has climbed many classic routes in the European Alps, particularly around Chamonix and Pontresina. He has completed many ascents in the Georgian Caucasus and in 2019 explored the Lachama Khola region of Nepal. In 2022 he also climbed in the Bolivian Andes. He is a competent rock climber, having climbed extensively in the UK, and leads to HVS 5a/5b. He is a competent ice climber (leading to WI4+) having completed many routes in the Canadian Rockies and in the UK.



**Steve Kempley**, 64, British, recently Retired Doctor (Neonatal Paediatrician), AC Member. International Mountain Leader (qualified 2019). Mid-grade rock and ice climber (F5, WI4). Mountaineering and climbing experience in UK, N America, Bolivia and Caribbean, Africa, Kyrgyzstan and Europe. Staff President of Barts and The London Alpine Club, a student mountaineering club.



**Howard Pollitt**, 64, British, Retired Businessman, AC member. Extensive mountaineering and ski touring experience in the Alps in addition to successful expeditions to Greenland, Caucasus, Canadian Rockies, Mongolia and the Himalaya. A proficient ski-tourer with lead climbing ability to HVS on rock and grade IV/V on ice.





The team at Base Camp. Back row L to R: Jamie Goodhart, Howard Pollitt, Tshring, Steve Humphries, Derek Buckle & Steve Kempley. Front row L to R: Sandeep, Surya, Maipal, Sangel & Phupu Dorje

### **Support Staff & Administration:**

All in-country arrangements were made through the husband and wife team of Chewang Motup and Yangdu Gombu *via* their trekking company Rimo Expeditions (229 DLF Galleria, Phase IV, Gurgaon, Haryana – 122022, India; email [info@rimoexpeditions.com](mailto:info@rimoexpeditions.com); tel: 91 – 124-2806027 / 28; Fax: 91 – 124-2806030; [www.rimoexpeditions.com](http://www.rimoexpeditions.com)). We have worked with Rimo many times over the last twelve years and they have consistently accommodated our requirements. They have the breadth of organisation to respond rapidly to problems and changes of circumstance that have greatly facilitated our expeditions. Both they, and their staff, have always been a pleasure to work with.

In addition to Shri Vanapalli TDAK Balaji, the Liaison Officer appointed by the Indian Mountaineering Foundation, who was both good company and of invaluable assistance in our dealings, we were supported by three exceptional high altitude porters (HAPs, Sandeep Rai Sherpa {sirdar}, Sangel & Phupu Dorje), our excellent cook (Surya) and his two assistants (Maipal & Nima). We also had the services of a willing and enthusiastic horseman, Tshring, who stayed with the BC team when he was not ferrying gear up or down the valley.



Shri Vanapalli TDAK  
Balaji (aka Anand)



Sandeep Rai Sherpa



Sangel



Phupu Dorje



Surya



Maipal



Nima



Tshring



From L to R: Tshring, Surya, Maipal, Phupu Dorje, Sandeep, Nima &amp; Sangel at BC

**Itinerary: (see also Appendix 2 {for daily itinerary} and Appendix 3 {for GPS locations})**

**The journey to and from Base Camp in the Tirit Valley:**

Our journey proper began in Leh where we spent several days acclimatising to the 3,500m altitude before attempting to cross the Khardung La, which at 5,370m is one of the world's highest motorable roads. Following a brief halt at the pass, we continued to Diskit with its old monastery and impressive Golden Buddha, before lodging a little beyond the village of Tirit in Kyaja. A short drive the next day took us to the foot of the Tirit Phu where we joined our support team and the horseman, Tshring, who was to ferry our equipment to base camp. Local herders have used the summer pastures of the Tirit Phu for generations, but as the lower valley is steep and impassable it is not possible to follow close to the river until reaching what is euphemistically called the Jungle area at Wasekhar. Because of this, the well-defined track begins at the Buddhist shrine above Tirit. It was not long before the 8 horses were loaded and ready for the three-day trek to our proposed



The Golden Buddha at Diskit





Jamie on the steep ascent to the Chamba La

base camp at Arganglas (see map 2 in Appendix 1). The track initially rises steeply to surmount the prominent shoulder leading to Chamba La (3,945m) with its extensive views over the Shyok river and its junction with the Nubra river. On reaching the La the path descends gently before climbing again to traverse the true left of the valley. It was an undulatory route that kept high to avoid plunging into deep ravines that crossed the track with monotonous regularity. Some 6km and over 1,000m of climbing later we eventually descended to camp, a little above the main river at Wasekhar (3,945m). This site was marginally lower than the Jungle camp that we had used in 2016, although it was more open, had clean water from a tributary stream and was infinitely more pleasant.

On the 8<sup>th</sup> September we decamped to follow the Tirit Phu through the now heavily overgrown Jungle area. It was hard enough for walkers as we snagged on every vicious thorny bush that we passed, but this was nothing to the problem that the laden horses experienced. We heard later that it was necessary to hack the undergrowth with machetes before they could escape into more open ground! We had had it easy by comparison, yet it was still a relief to escape the clutches of such aggressive vegetation. Once free of the Jungle we climbed steeply back to the main path to continue another 6km up the valley before reaching our second camp at Phonglas (4,639m). (NB. Apart from needing a good camping spot providing vegetation for horse fodder, the direct path was dangerous and unsuitable for them so the diversion was essential).



Steve H at Phonglas with Nya Kangri behind



Crossing the Tirit Phu at BC

Phonglas is the traditional camp site for those wishing to attempt the impressive Nya Kangri (6,480m). As a consequence, it regularly attracts the attention of mountaineers, although to date none has succeeded. We simply admired its majestic countenance before continuing along the true left bank of the Tirit Phu until we reached the site of our proposed base camp beneath the terminal moraine of the Rassa Glacier close to Arganglas at 4,756m. Unfortunately, we were still on the wrong side of the river and the current was too strong to negotiate by

the time the horses arrived. A temporary camp was called for, so that we could ford the river early the next day and establish our base camp permanently. By this time a young dog, which had come up with a large army team planning to prove their skills on Argan Kangri (6,789m) in the Phunangma Glacier, decided that we might be a better source of food and decided to latch onto us. He subsequently stayed until the army team descended a few days before us.



As eight horses were insufficient to ferry all of our equipment from Tirit in a single carry, Tshring immediately descended for the second consignment. Two days later he reappeared so that by early on 12<sup>th</sup> September the base camp was fully operational and in constant use until we were ready to leave the valley.



BC at Arganglas with the terminal moraine behind

By now it was clear that Arganglas was not the best place in which to cross the Tirit Phu and during the multiple trips that the horses made in transporting our gear a much better crossing was found close to Phonglas. This was in fact where we had crossed 8 years earlier, but memory being what it is we had forgotten. We did not forget when we departed from base camp on 26<sup>th</sup> September, however, so our return to the valley followed the alternative path on the true right of the river before we crossed to the opposite bank near to Phonglas and continuing to camp at Wasekhar in the same place that we had used on the ascent. This meant that we had only a short descent of 3h or so to Tirit the following day thus allowing us to return to Leh in good time.

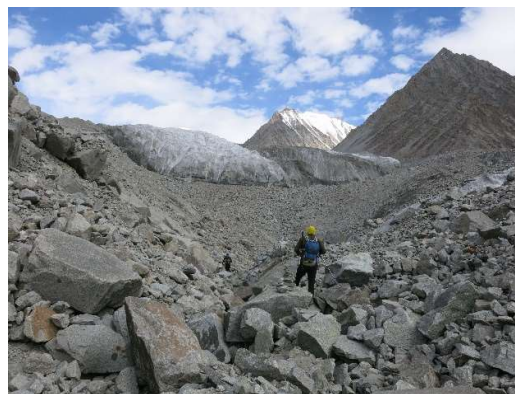
### Exploration of the Rassa Glacier:



ABC at 5,100m

Those with energy to spare spent the afternoon of 10<sup>th</sup> September investigating the route to ABC. Since we had the GPS coordinates of ABC from my previous visit this was relatively easy to locate although the route involved negotiating a fair amount of complex moraine that seemed to have changed somewhat over the intervening 8 years. Essentially the route followed a well-established track over the convoluted terminal moraine before degenerating to boulder hopping and then a short descent to the sandy oasis at 5,100m. The journey from base camp took anywhere between 2 and 3h depending on the load being carried. The high-altitude porters who helped establish ABC did this considerably quicker, of course. With their help ABC was fully established by 13<sup>th</sup> September.

We were now in a position to explore optimal routes onto the Rassa Glacier proper and to determine where we should locate the site of the higher camp (Camp 1). It was soon obvious that direct access to the glacier would be problematic as the snout terminated in a significant ice cliff. Two teams therefore separated to attempt access either via the true right lateral moraine or via a ramp leading up on the true left. Neither was easy but eventually a consensus was reached that we should approach using the lateral moraine since



Howard & Steve H below the snout of the Rassa Glacier

this party had managed to reach a suitable site near the foot of Glacial arm 2 at 5,500m (see Map 1). By 15<sup>th</sup> September four of the team were in a position to move up to Camp 1 when the high-altitude porters arrived to help the relocation. Some 5h later the support team returned to ABC before continuing to base camp with Derek, who was not performing well enough to join the others.



High camp on Glacier 2 at 5,500m, Dagarpheth behind

Over the next few days, the advance team extensively explored Glacial arm 2 during which they dismissed PK6189 as a possible objective. Fortunately, they successfully reached the 6,035m col separating PK6365 from Tusuhm Kangri where they realised that this offered a viable, objectively safe approach to PK6365 itself. Several days later an abortive attempt was made on the summit and two of the party decided to return to base camp. Undeterred, Howard and Steve K remained at Camp 1 to carry additional gear to a stash below the col before successfully reattempting the climb on 20<sup>th</sup> September. Roping up from the stash it took a further 5.5h to reach the summit via the ESE Ridge and make the first ascent of the peak. Initially they moved together until the bergshroud at 6,200m before pitching the final 50° ice slope to the top. The views in all directions were spectacular. From the summit a short downclimb and three long abseils led to easier ground and a safe return to Camp 1, just as the light was fading some 13h after leaving. Having noticed a half moon hovering over the summit early in the climb they decided to name the peak Dagarpheth Kangri, which is Ladakhi for Halfmoon snow peak.

Over the next few days, the advance team extensively explored Glacial arm 2 during which they dismissed PK6189 as a possible objective. Fortunately, they successfully reached the 6,035m col separating PK6365 from Tusuhm Kangri where they realised that this offered a viable, objectively safe approach to PK6365 itself. Several days later an abortive attempt was made on the summit and two of the party decided to return to base camp. Undeterred, Howard and

Steve K remained



Climbers on PK6365 ESE Ridge



Howard on the col beneath Dagarpheth Kangri; Glacier 2 behind

Planning to extend the exploration to Glacial arm 3, Jamie and the three high-altitude porters attempted to return to Camp 1 on 21<sup>st</sup> September but as visibility was poor and it had snowed overnight the moraine was treacherous. They rightly decided to return to base camp knowing that those still at the high camp had sufficient supplies should the bad weather continue. A





*Base camp after the storm*

second more successful attempt to reach Camp 1 was made the following day but on arrival it soon became clear that with a deterioration in the weather and the limited time now available a change in plan was necessary. It now appeared unlikely that much more could realistically be achieved by relocating to a higher camp on Glacial arm 3 so Camp 1 was dismantled and the whole team descended to base camp (a decision that subsequently proved to be prophetically wise as more sustained snowfall was to follow).

The next couple of days passed relatively uneventfully with the assault team resting while others made exploratory trips up the Phunagma valley to investigate potential routes to Thugu via its eastern face should future parties wish to visit the area. Harish Kapadia had failed in his attempt to climb Thugu in 2001<sup>3</sup> and it is thought that no others have attempted the mountain since.

By 25<sup>th</sup> September a lot of snow had fallen overnight and the whole valley was steeped in mist. Nevertheless, Tshring returned cold and wet having taken the first load of non-essential equipment down to the valley, but otherwise nobody moved far from the camp. With such conditions it was time for us to leave, albeit a day or so before we had intended, to enjoy our last few days in Leh.

#### **Future opportunities in the region:**

Nya Kangri (6,480m) continues to attract mountaineers approaching from Phonglas, yet none has succeeded. It remains a very attractive objective for strong parties, especially if approached from alternative directions. The dominant unclimbed peak above Arganglas is Thugu (6,158m). This mountain was unsuccessfully attempted by Harish Kapadia during his 2001 expedition,<sup>3</sup> but no further attempts have been recorded. Unlike Nya Kangri, it has little snow cover until close to the summit water availability is believed to be a significant problem.



East Face of Nya Kangri from Glacier 2



East Face of Thugu from Arganglas

Numerous peaks bordering glaciers 2, 3 and 4 remain to be attempted; notably PK6189, PK6417, PK6440 and PK6280 (see Map 1) as well as alternative routes on the 5 peaks that

have now been successfully climbed. Moreover, little is known of the peaks to the south of the Tirit Nala close to Arganglas, but these suffer from objective dangers and unpleasant approaches. The most significant issue facing aspiring parties is the state of the Rassa Glacier's terminal moraine and this is possibly the reason why the adjacent Phunangma valley seems to attract more interest. We barely visited this valley but undoubtedly there are opportunities still to be found.



Peaks south of Arganglas from above base camp

Other opportunities presumably exist from the Shukpa Kunchang Glacier but these would require further research.



View north from the col towards the Shukpa Kunchang Glacier with Dagarpheth Kangri on left.

### **Conclusion:**

The Rassa Glacier is a highly complex glacial region barred by a difficult access through complex and demanding moraines. To date, only three expeditions are known to have visited the area, one led by Muni in 2014<sup>4</sup> and two led by myself; in 2016<sup>1</sup> and the current one in 2022. Only five of its 6,000m peaks have been climbed, leaving considerable opportunities for further exploration and first ascents, particularly in the far reaches of Glacial arm 3. Access to the upper glacier was attempted by us via the Sumur Lungpa in 2017<sup>2</sup> but this was discounted as unacceptably dangerous on account of the avalanche potential. On the current expedition we successfully explored the upper reaches of Glacial arm 2, which had previously not been visited, and succeeded in reaching the col between PK6365 (Dagarpheth Kangri) and PK 6219 (Tusuhm Kangri). From the col Howard Pollitt and Steve Kempley successfully made the first ascent of PK6365 via its ESE ridge at Alpine grade AD on 20<sup>th</sup> September 2022.



**Income & Expenditure:****INCOME:**

MEF Grant:	£ 4,500.00
Alpine Club Climbing Fund Grant:	£ 1,600.00
Austrian Alpine Club (UK) Grant:	£ 1,500.00
Fell & Rock Climbing Club	£ 500.00
BMC	£ 450.00
Additional personal contributions:	<u>£13,685.00</u>
<b>Total:</b>	<b>£22,235.00</b>

**EXPENDITURE:**

Flights to and from Delhi:	£ 3,337.00
Flights to and from Leh & Delhi:	£ 606.00
Excess Baggage charges:	£ 320.00
Visas:	£ 800.00
Insurance:	£ 3,221.00
IMF Peak Fees:	£ 1,068.00
Liaison Officer clothing allowance:	£ 455.00
In country costs (to Rimo):	£11,764.00
Carbon offset costs	£ 264.00
Additional meals & refreshments:	£ 150.00
Gratuities:	<u>£ 250.00</u>
<b>Total:</b>	<b>£22,235.00</b>

**Bibliography:**

1. D. R. Buckle. Exploration in the East Karakoram, *Himalayan Journal*, 250-257, **72**, 2017
2. D. Buckle, The East Karakoram Revisited, *Himalayan Journal*, 116-122, **73**, 2018
3. H. Kapadia, In the Land of the Argans, *Himalayan Journal*, **58**, 2002
4. D. Muni, *American Alpine Journal*, 310, **57**, 2015
5. Tashi Ldawa Tshangspa, Petroglyphs of Ladakh: The Withering Monuments.  
[www.tibetheritagefund.org/media/download/petroglyphs.pdf](http://www.tibetheritagefund.org/media/download/petroglyphs.pdf)

**Glossary:**

Indian names vary widely in their spelling, presumably reflecting the phonetic translations used by cartographers. We have used those employed on the Survey of India maps wherever possible. Given heights are also those used on the 1:50,000 Survey of India maps unless noted otherwise.

*Gompa* is a monastery

*Stupa* is a dome-shaped construction erected as a Buddhist shrine

*La* signifies a pass

*Nala*, *Tokpo* & *Phu* all imply a river, stream or valley, but other terms are also used

## Maps:

The most readily available map is the Leomann 1:200,000 Indian Himalaya Map, Sheet 3, Jammu & Kashmir, which can be obtained from Stanfords, 12-14 Long Acre, Covent Garden, London, WC2E 9LP, [www.stanfords.co.uk](http://www.stanfords.co.uk). Also available from the same vendor is the 1:150,000 Editions Olizane map covering Ladakh & Zaskar North. A 1:175,000 Ladakh & Zaskar Trekking map is published by Milestone Books as part of their Himalayan Series and is available from Amazon, [www.amazon.co.uk](http://www.amazon.co.uk); ISBN: 9788190327091.

Electronic versions of the Russian 1:200,000 maps, 200k-i43-12 & 200k-i43-18 are held by the Alpine Club, 55 Charlotte Road, London, EC2A 3QF, [www.alpine-club.org.uk](http://www.alpine-club.org.uk) and are available free on-line.

Satellite pictures are freely available from Google Earth, [www.googleearth.com](http://www.googleearth.com)

## Sponsors:

The expedition was supported by the following sponsors to whom we are especially grateful:



Montane Alpine Club Climbing Fund



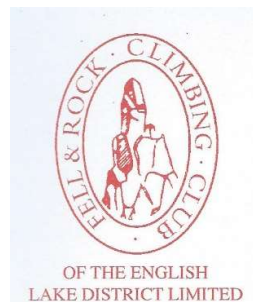
Mount Everest Foundation



Austrian Alpine Club (UK)



British Mountaineering Council

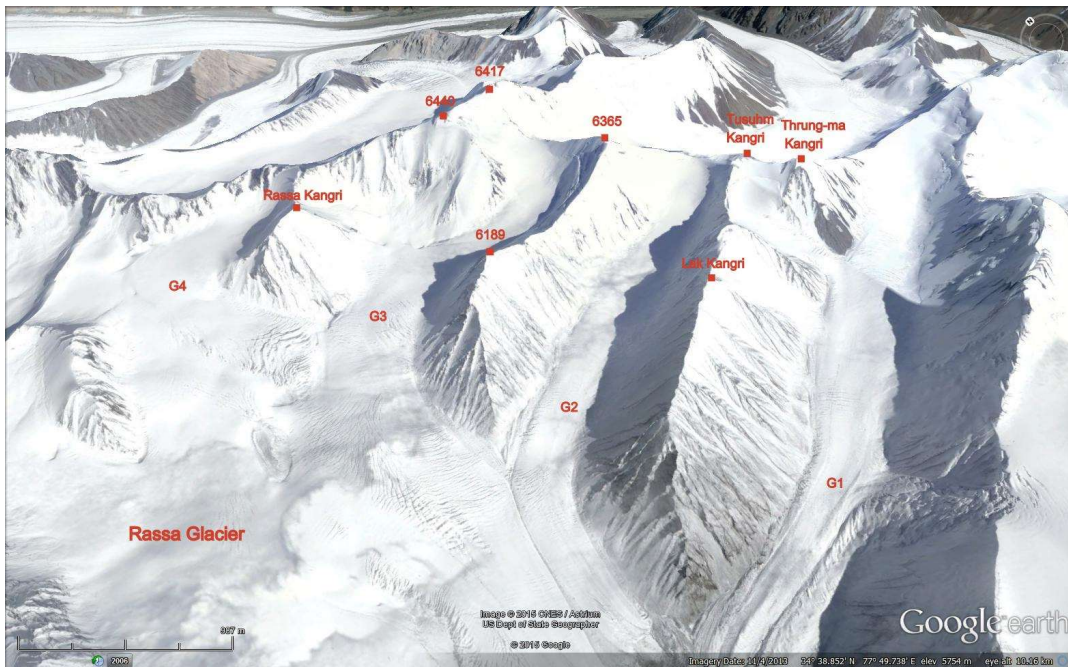


Fell & Rock Climbing Club

### Appendix 1



Map 2. Milestone 1:175,000 map of the Nubra Valley showing the location of the Tirit Phu. Note that on this map the Rassa Glacier is incorrectly named as the Tirit Glacier



Annotated Google Earth Satellite image of the Rassa Glacier showing PK6365 at centre top

## Appendix 2

### Daily itinerary:

Thursday 1 <sup>st</sup> September	Team flew overnight from Europe to Delhi; Steve K to join us in Leh
Friday 2 <sup>nd</sup> September (Muse Kapashera by Sarovar Portico hotel, Delhi)	Team arrived in Delhi to meet with the IMF and Anand our Liaison Officer at 12.00 noon
Saturday 3 <sup>rd</sup> September (Kanglachen Complex, Leh)	Team flew from Delhi to Leh (3,500m) to meet Rimo representatives and confirm onward plans. Requested Nebra Valley permits.
Sunday 4 <sup>th</sup> September (Kanglachen Complex, Leh)	Steve K arrived and rested. Howard & Jamie motorcycled to Chilling while Steve H and Derek hired a taxi to visit the Hemis Monastery and walk up to the hermit's cave.
Monday 5 <sup>th</sup> September (Kanglachen Complex, Leh)	Remained a further day in Leh to allow Steve K to acclimatise further. Jamie motorcycled to the Changla while Anand and the rest of the team walked to Sando via the hill palace before getting a return taxi.
Tuesday 6 <sup>th</sup> September (Yarab-Tso hotel, Kyaja)	Departed Leh to cross the Khardung la pass (5,370m) to visit Diskit Gompa with its impressive Buddha before continuing to our accommodation at Kyaja
Wednesday 7 <sup>th</sup> September (Camp near Wasekhar)	Drove to the Buddhist shrine at Tirit to meet up with our support team and horses for the trek along the Tirit Phu. We first climbed to the Chamba la (3,945m) before descending to camp at Wasekhar (3,945m).
Thursday 8 <sup>th</sup> September (Camp at Phonglas)	Continued the trek to Phonglas (4,639m) keeping to the true left of the Tirit Phu to reach an open camp ground with excellent views of Nya Kangri (6,480m).
Friday 9 <sup>th</sup> September (Temporary camp near Arganglas)	Continued the short trek to a little beyond Arganglas to stop at 4,750m near the confluence of the rivers descending from the Rassa and Phunangma glaciers. Crossing the Tirit Phu was problematic late in the day so made a temporary overnight camp.
Saturday 10 <sup>th</sup> September (Base Camp, Arganglas)	We crossed the river easily the next morning to establish a permanent base camp at 4,750m where we had camped in 2016. The more energetic members of the team investigated the route to ABC.
Sunday 11 <sup>th</sup> September (Base Camp, Arganglas)	Several team members went to explore the route to and above ABC while others hunted petroglyphs on the terminal moraine.
Monday 12 <sup>th</sup> September (Base Camp, Arganglas)	Most team members walked up to ABC for additional acclimatisation. Horses arrived with the second tranche of gear so we could now relocate.



Tuesday 13 <sup>th</sup> September (ABC)	With HAP support the team relocated to ABC at 5127m in around 3h. There were now three pools on the sandy depression. Several members went to explore above camp.
Wednesday 14 <sup>th</sup> September (ABC)	HAPs arrived early with an additional tranche of gear and then returned to BC. The rest of the team split into two groups to try and identify the optimal route to our proposed Camp 1 site. The LHS approach team found the better route and located a suitable site at 5,500m at the foot of Glacial arm 2.
Thursday 15 <sup>th</sup> September (Camp 1)	HAPs arrived around 10.00 and all bar Derek left soon after to relocate to C1. When the HAPs arrived back at ABC in 5 hours they returned to BC with Derek, who was not performing well.
Friday 16 <sup>th</sup> September (Camp 1)	The C1 team continued to the col at the head of Glacial arm 2 at 6,035m in 4h and then returned to C1. Beautiful sunny day
Saturday 17 <sup>th</sup> September (Camp 1)	A rest day for the C1 team
Sunday 18 <sup>th</sup> September (Camp 1)	C1 team climbed to the shoulder above the col in an attempt on PK6365, but stopped at around 6,271m as concerned about the conditions on the ESE ridge and cold damage to Steve H's hands.
Monday 19 <sup>th</sup> September (Camp 1 & BC)	Howard and Steve K made a gear drop beneath the col with additional ice screws and rope while Jamie and Steve H returned to BC via the true left of the glacier (now not the preferred route).
Tuesday 20 <sup>th</sup> September (C1 & BC)	A relaxing day for those at BC, but Howard and Steve K left early to collect the stash and continued to the summit of PK6365. They roped up at the stash and moved together via the SE and then ESE Ridge until the bergshrund before pitching up 50° ice to the summit (5.5h). After downclimbing to rocks, three full-length abseils took them to easy ground. They returned to C1 after a 13h day.
Wednesday 21 <sup>st</sup> September (C1 & BC)	Jamie and the HAPs started towards C1 in order to help the high party relocate to a second high camp near the foot of Glacial arm 3. Poor visibility and snow cover over difficult ground caused them to retreat and return to BC. Howard and Steve K wisely remained in their tents while heavy snow fell.
Thursday 22 <sup>nd</sup> September (BC)	A very cold night at C1 with temperatures falling to -10 to -15°C. Jamie and the HAPs climbed to C1 but conditions were far from ideal and a decision was made to abandon attempts to establish a higher camp and evacuate back to BC while retreat was still possible.

Friday 23 <sup>rd</sup> September (BC)	Essentially a rest day for the team and surprisingly warm and sunny after the previous day. As our time was now limited the horseman descended to Tirit with a stash of unneeded gear since it could not be handled in a single carry.
Saturday 24 <sup>th</sup> September (BC)	A cool night and a little overcast. Only Steve H, Derek and Anand were keen to venture out, so after crossing the Tirit Phu they ascended the Phunangma valley in the hope of researching a viable route to Thugu 6,158m, the unclimbed mountain at the bifurcation of the two valleys. They reached their high point of 5,060m after 2h before returning to camp.
Sunday 25 <sup>th</sup> September (BC)	It snowed a lot from 8.00pm overnight and snow continued throughout the day, rather vindicating the decision of the C1 team to descend rather than continue higher. None of the BC team ventured out but the horseman arrived wet and cold after a sterling effort in poor conditions and was clearly verging on hypothermia.
Monday 26 <sup>th</sup> September (Camp at Wasekhar)	Some 20cm of snow had now fallen over the last 30h but at least the sun had returned. A collective decision was made to return to the valley a day or so early as there was clearly little more that could be done under these conditions. The whole team decamped for the walk out to Wasekhar.
Tuesday 27 <sup>th</sup> September (Kanglachen Complex, Leh)	We arose early for the 3h of hard descent to Tirit where we met with our transport for the drive back to Leh
Wednesday 28 <sup>th</sup> September (Kanglachen Complex, Leh)	A day of leisure, sorting gear, getting shaves, haircuts and, of course, shopping.
Thursday 29 <sup>th</sup> September (Kanglachen Complex, Leh)	Another easy day filled by eating, shopping and recuperation.
Friday 30 <sup>th</sup> September (Muse Kapashera by Sarovar Portico, Delhi)	We took the early flight to Delhi to meet with the IMF before being transferred to our hotel.
Saturday 1 <sup>st</sup> October (Home)	The party flew from Delhi back to Europe at various times

### Appendix 3

#### GPS Coordinates & Heights of Key Locations

Location	N coordinates	E coordinates	Height	Comment
Wasekhar camp	34°34.102'	77°42.153'	3,945m	7/9/22, First camp on walk-in
Phonglas	34°33.711'	77°45.882'	4,369m	8/9/22, Second camp on walk-in
Base camp, Arganglas	34°35.979'	77°47.483'	4,756m	10/9/22, Confluence of Rassa and Phunangma valleys
Advance base camp	34°37.066'	77°48.501'	5,100m	13/9/22, By small pools on a sandy moraine depression
High point at true LHS foot of Rassa Glacier	34°37.653'	77°49.099'	5,505m	14/9/22, Exploratory route to C1
Camp 1	34°38.415'	77°49.252'	5,500m	14/9/22, At foot of Glacial arm 2
Col between Tusuhm Kangri and PK6365	34°39.188'	77°51.208'	6,035m	16/9/22, No descent possible on NE side
PK6365 summit	34°39.384'	77°50.627'	6,365m, 6,382m by GPS	20/9/22, First ascent, Dagarpheth Kangri
High point in Phunangma Valley	34°35.164'	77°48.881'	5,060m	24/9/22, Exploratory foray

### Appendix 4

#### Weather and Conditions:

Although June is reported to be the best time to visit this part of the East Karakoram, difficult river crossings may be encountered. This September, by contrast, we found the main river fairly benign and relatively easily crossed early in the morning, although the Tirit Phu in particular was much more challenging as the day progressed. In the late afternoon even our experienced horseman refused to attempt a crossing. Subsequently we found that crossing at Phonglas, rather than at Arganglas, was preferable and this we did on the descent. As on our last visit in 2016, we generally experienced extended periods of fine, sunny weather, although these were interspersed with one or two days of snowfall, one of which confined us to base camp.

The greatest problem that we encountered was the state of the moraine fields at the foot of the Rassa Glacier. These appeared to be considerably worse and more extensive than in 2016 and were deemed impossible to negotiate safely when covered with treacherous snow. We encountered few significant crevasses and most of the glacier that we explored was low angled

and relatively straightforward. It was my impression that glacial recession had taken its toll on the Rassa glacier as there was now significantly more debris separating Glacial arms 1 and 2.

## Appendix 5

### Flora & Fauna:

Ladakh is a desert area and little vegetation exists away from close proximity to the major rivers. The Tirit Phu itself essentially constituted a steep barren landscape, particularly in the lower section where access to the river was difficult, if not impossible. Higher in the valley there were two areas of sparse coarse grass on which domesticated animals could graze, particularly near our Base Camp at Arganglas, although there was little evidence of use during our time in the valley. A herd of presumably domesticated yaks were occasionally seen on the moraine above base camp and the kitchen staff reported that they saw a snow leopard at the Wasekhar camp on our descent. It rapidly vanished and was probably attracted by the horses that we were using; one of which was a young foal accompanying its mother. From the skulls and horns littering our base camp ibex clearly exist in the valley, although we never saw any. On several occasions red weasel-like animals were seen among the rocks as well as glimpses of what we think were Ladakh picas. Wagtails and redstarts were common visitors to the streams surrounding base camp, but larger birds were relatively rare.

## Appendix 6

### Geology and Artefacts:

The major rock type in the Tirit Valley is granitic, usually of a medium grained variety. It has suffered major erosion and as a consequence all steep faces rose above vast talus slopes. Opportunities to rock climb on stable faces appeared limited.

Man has inhabited the valleys of the Nubra, Indus and Zaskar for millennia and there is abundant evidence of his passing in the petroglyphs that he has left behind. Study of the more major areas has linked these drawings to the steppe peoples of the Bronze Age and they are widespread throughout Ladakh and Tibet. We could, however, find no readily available account relating to those that we observed surrounding the glazed granite outcrops of the Tirit Valley. Like other drawings, they tended to depict animals such as the ibex and deer. A local researcher, Tashi Ldawa Tshangspa, has discovered many similar sites spread throughout Ladakh.<sup>5</sup>



Petroglyph of an ibex near Base Camp



Petroglyphs above Leh



