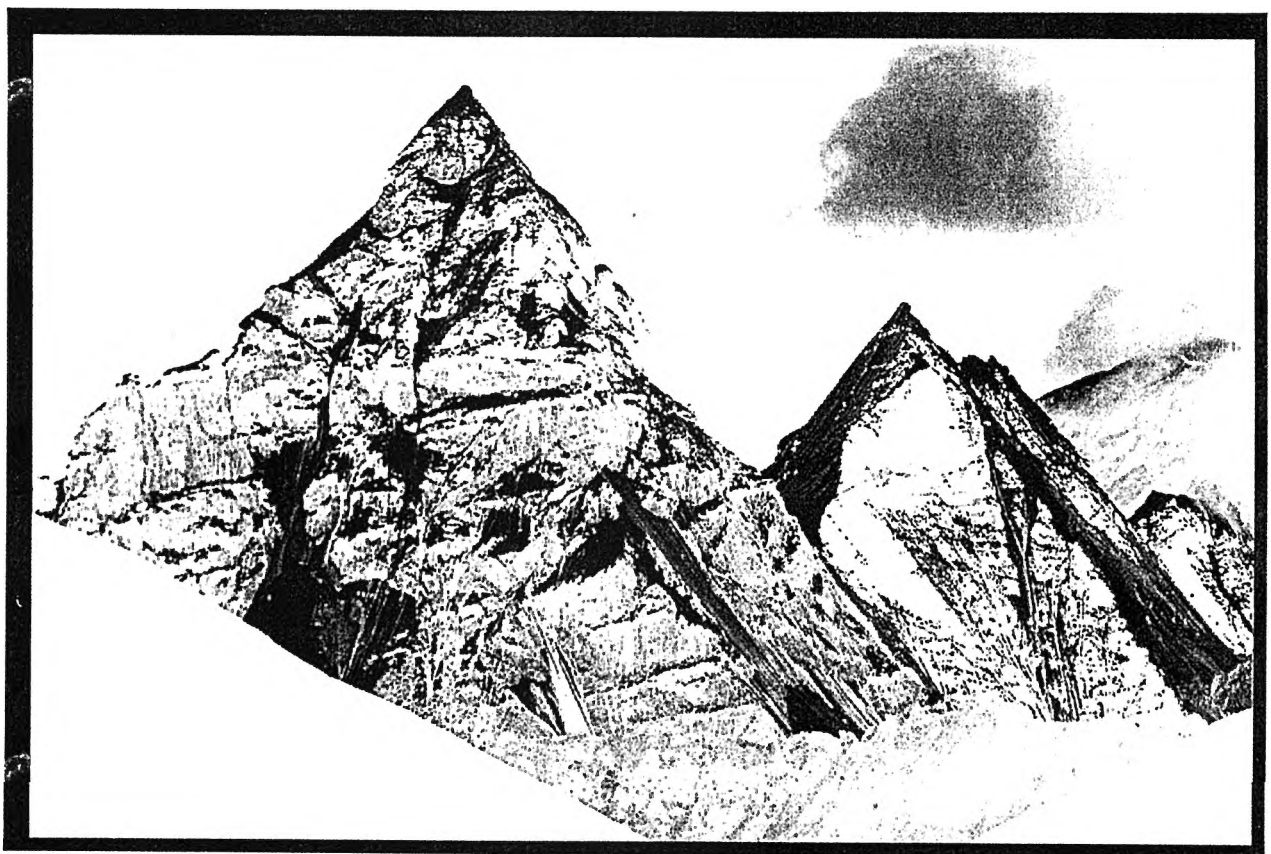


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Expedition Report 1997

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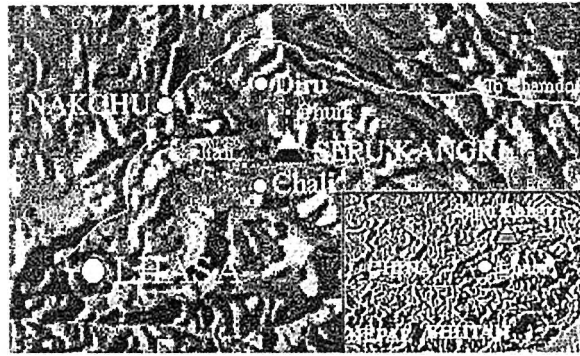
BRITISH SEPU KANGRI EXPEDITION 1997

Introduction

It remains an enigma that there is range of mountains in Tibet, comparable in length to the entire Swiss Alps, which remains almost unknown. The Eastern Section of the Nyangla-Qen-Tangla Shan lies barely three hundred kilometres north of the Himalayan frontier crest, stretching across a remote area of central Tibet. This land is sparsely populated yet fertile, a tract of forested valleys coursing through the Tibetan plateau. Its peaks range from gentle hills of around 5000 to 5500 metres in the north to a range of dramatic, steep, and difficult ice peaks in the central and southern sectors. There is a pattern of inhospitable weather throughout most of the warmer, summer months, with much fresh snowfall. Sepu Kangri, 6690m, at 30.9°N 93.8°E is the highest summit.

This mountain region north-east of Lhasa, loosely called the Sino-Himalayan axis by explorers earlier this century or sometimes referred to simply as the Tang-La, is the source of three great rivers of Asia, the Yangtse, the Mekong and the Salween¹. Of these, Kingdon Ward wrote: "The Salween remains the least known. It rises in about 32°N, 92°E and flows east for over 300 miles, before bending south to roll through the great gap (*the Salween/Mekong divide, the rivers running into Burma (Myanama) and Vietnam*)....but all this part of its course, besides its source remains unexplored". Despite being written over eighty years ago, and with little respect to the inhabitants of the region, who provided a centuries old major trade route from Lhasa to eastern Tibet, there remains an air of mystery, and poverty of information about the Salween, or the Naq Chu, the Black River of Tibet, and the range that lies to its south.

The glaciers from the northern slopes of Sepu Kangri, and its satellites, drain into this river, but, like the summits themselves, remain hidden from the river gorges. The only European explorers to penetrate the area, John



Hanbury Tracy and Ronald Kaulback in 1934, approached from the Burmese border, followed the course of the Salween, crossing high passes to avoid the more difficult section of the gorge, until Diru, at 31.5°N, 93.7°E, the last town before our own roadhead. Here they were stopped both by political difficulties, and the danger of robber bands in the area towards Naqchu, (31.5°N, 92.1°E), the caravanserai town some 10 days march north of Lhasa, a reminder of how hostile this area used to be. There is no mention in their writings^{2,3} of this major mountain range, though they passed within fifty kilometres of its highest summit.



Traditional cantilever bridge over River Kichu on way to base camp

¹ Kingdon-Ward. *The Mystery Rivers of Tibet*. London, Seeley Service 1923.
² Hanbury Tracy, J. *Black River of Tibet*. London, Frederick Muller 1938.
³ Kaulback, Ronald. *Salween*. London, Hodder & Stoughton, 1938.



Base camp beside the frozen Samtso Taring with the Sepu Kangri massif in background

It was with this intriguing background that we reconnoitred the northern side of Sepu Kangri in the summer of 1996, finding a route south from Diru into the valleys leading to the glaciers of its north face. In a separate journey we also visited the southern side of the range.

For the Tibetan nomads of the region, Sepu Kangri remains to this day, an unknown name. From the shore of Sam-Tso-Taring, the frozen lake at 4700m, the north face of Sepu-Kung-Lha-Karpo, The Mountain of The White Sky God rises to a complex series of summits. In this land of oral history, legend, we had learnt on our journey that there were "nine snow capped peaks, from which snowclouds stream in the wind like galloping white horses' manes, and from which waterfalls cascade like *kartas*, the Tibetan ritual silk scarves, into nine lakes.....and beyond them, over the Sa La, a 5600m pass, there was the hidden kingdom of Nagru, once independent, isolated from the main valleys by other high passes, a land of snow leopards, wolves, pheasants, and dense forests.....". Legend soon became reality.

Here, a cirque of nine ice peaks *did* surround the frozen lake, rising over 2000 metres from glaciers which descend to centuries old shores. Rarely were all nine summits free of a cloud cap; icefalls, seracs, and steep ice faces rose in tiers to their crests. In the three valleys which make up northern side of the massif, there were nine lakes and several frozen waterfalls which reach the glaciers. And, as if to complete the

allegory, a pure white horse with a flowing mane was a frequent visitor to our Base Camp....

For the local people, the principal summits are The White Sky God, Sepu-Kung-Lha-Karpo, the highest, and its immediate neighbour to the east, Sepu's Son, Bon-Che-Dadhul. The Turquoise Flower, or Sepu's Daughter, Yu-Yi-Metok, is a stark 6800m pyramid to the west of the main peak. There are six other summits with Tibetan names. These peaks are sacred; the Samda monastery, an 800 year old *Bonpo* fortress shrine, presently housing 40 monks is a day's journey below them. Thus, our view from base camp was hard to reconcile with a comment from one of our own elders at the Alpine Club before we left....'Really, there are no mountains of any interest in *that* area of Tibet.....'

For our hosts on this expedition, the China Tibet Mountaineering Association, whose cooperation could not have been better, this area also remains a relative blank on the map. Like much of the Himalayan crest, good maps doubtless exist, but are still restricted, for military use only. The whole region remains firmly closed to foreigners. Our own journeys were the product of lengthy negotiation. The file of correspondence, commencing with a photo taken from a Chengdu-Lhasa flight one early morning in March 1982 (The British Everest Expedition to Tibet), tells a story of despair, hope, disappointment, giving way to encouragement, commitment and, finally, travel, to this remarkable area.



First view of Sepu Kangri (skyline right centre) from plane flying from Chengdu to Lhasa.

The Climb

When we reached our base camp on 30 April, it was a bright sunny day and the Sam-Tso-Taring, was a gleaming field of snow covered ice. It gave us little warning of the weather we could expect in the coming weeks. Our base was an idyllic site on the shores of the lake just below the homes of our neighbours who live in this remote place throughout the year. We were to come to know them well in the coming weeks.

The following day dawned bright and clear. We unfurled the colourful prayer flags that our Sherpas had brought from Kathmandu and held a pujah or blessing conducted by one of our neighbours who read and chanted from a traditional text. The climb could now start.



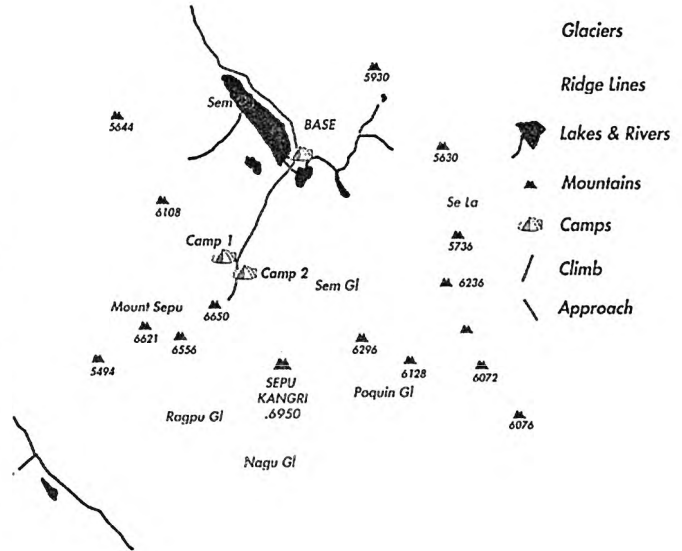
The Pujah at base camp

On our recce in August, I had identified the North-East ridge of Seamo Uylmitok as the most feasible route up the mountain, but we wanted to have another look before committing ourselves. That afternoon, John Porter Charlie Clarke and Jim Lowther climbed a 5600 metre hill to the north of base camp, while Jim Fotheringham and myself visited the hermit, who had lived for four years at the foot of the valley leading up to the north-western end of the main peak of Sepu Kangri. After talking with him and receiving a blessing, we walked on over a frozen lake and up a snow covered moraine to catch a glimpse of a possible route up to a col to the immediate north of Seamo Uylmitok. Jim thought there might be a route from this col onto the much easier angled west face of the mountain.



Jim Fotheringham leading difficult mixed ground in gully below camp 1.

A couple of days later we made a recce in force, camping on the glacier on the night of 4 May and the following morning carrying heavy sacks with camping equipment and a couple of days food.



Even in the cold of the early morning, we were breaking through the crust covering deep soft snow. It was an exhausting process, with Jim Fotheringham trail breaking all the way up to the col seven hundred metres above. The weather was windy with flurries of snow, a pattern we were to become all too familiar with in the coming weeks.

Early that afternoon we reached the col, to find it was a knife edged, gendarmed ridge with a startling drop on the south side to a glacier far below. The view along the ridge wasn't encouraging for it seemed to run into the North-West ridge of Seamo Uylmitok, with a steep drop onto the glacier to the south and then a ferocious ice fall to climb behind the peak.



Jim Fotheringham on steep snow covered ice on North East Face of Sepu Kangri

The following day we returned to base and decided to focus on what we named the Frendo Spur - the ridge leading to the summit of Seamo Uylmitok, but with the prospect of taking the easier ground on the face itself, which was glaciated.

We established Camp 1 on some rocks on the glacier below a large snow bowl leading up to a diagonal gully cum gangway that seemed to give a safe route up to the foot of the 'Frendo Spur'. We made our first foray on 10 May, when Jim



Jim Fotheringham and John Porter returning from pushing route out above camp 1.

Fotheringham led a desperate pitch on steep mixed ground in a bottle-neck that barred the way at the bottom of the gully. Beyond this the angle dropped off, but the following morning we very nearly turned back when John Porter was engulfed in a spin drift avalanche generated by high winds and flurried of snow on the face higher up.

This was to be a pattern of weather in the days to come. It was usually cloudy and windy first thing in the morning, clear for a short time in the middle of the day and then deteriorating into cloud and snow in the afternoon. It didn't give much time for climbing.

It took us two days to push the route up to the crest and this provided a perfect site for camp 2 with a snow hole and room for a tent. Jim Fotheringham and John Porter moved up on 14 May and started pushing the route out, initially on the crest of the spur, but as it steepened they cut out through a corridor between serac walls to get onto the main face reaching a height of 5850 metres. Jim Lowther and I moved up to the camp on the 15th and continued working on the route on the 16th. There was undoubtedly an element of danger in going up the face, since there was a huge quantity of snow and the ever present risk of avalanche. We felt that the unsettled weather combined with this threat, justified the use of fixed rope. The weather was still far from perfect, starting the day with snow squalls but clearing up around midday. It took us about three hours to reach the high point, and we then shared the lead up a series of snow fields, pulling over bergschrunds and only occasionally getting ice screw belays.

As we gained height we could see there was a ramp leading out to the left end of the col, but I, leading the final pitch that day, cut back to the right to get an anchor in what seemed a stable serac wall immediately beneath the Frendo Spur, thus making it relatively free of avalanche danger. We decided this would make a good site for a third camp and at 6050 metres a jumping off point for an alpine style

push for the summit.

It was a glorious afternoon with exciting views to the north and east of distant snow peaks. We reckoned we could see Amne Machin in the far distance, and closer to hand, to the east, some fascinating rock peaks that reminded us of Fitzroy and Cerro Torre.

That night we were full of optimism, but the following day, the weather seemed unsettled once again. We decided to return to base camp for a couple of days rest while we waited for the weather to settle and then make our bid for the summit.

It wasn't to be. On the night of 19 May half a metre



of snow fell at base camp. Much more must have fallen on the face. It snowed off and on for the next ten days with the mountain almost continually hidden in cloud. We were prepared to extend the expedition but there was no sign of an improvement in the weather and in the end we were very lucky to have a single clear day to rescue the equipment we had left at camp 2. We started our descent from base camp in a violent blizzard the following day.

Although the continuous bad weather had been frustrating, the area is so beautiful, our neighbours, whom we got to know well, so kind and the team itself, such a well balanced one, none of us felt depressed as we walked back down to the road head. We were already planning our return in 1998.



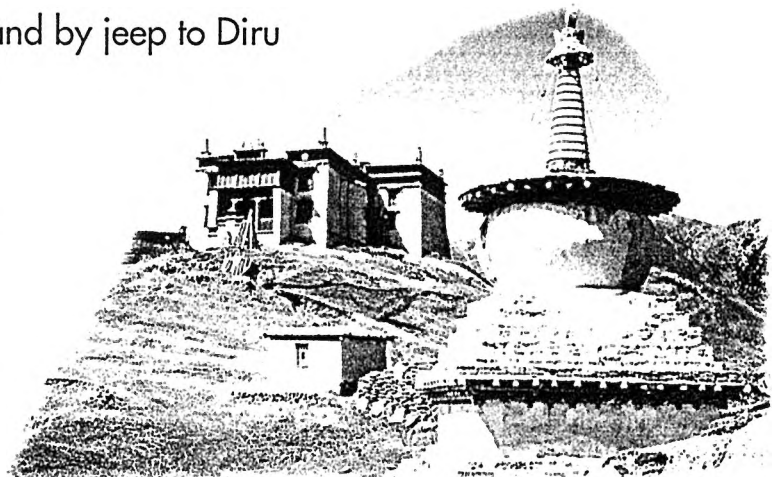
Base camp after a storm.

DIARY OF EVENTS

- 9 April Charles Clarke and Duncan Sperry fly to Kathmandu with PIA to purchase food and get gear through customs. This was done with the efficient help of Bikrum Pandey's Himalayan Expeditions.
- 14 April Nawang, our Sherpa cook sets out from Kathmandu with the truck carrying the expedition gear and food to Lhasa. A truck sent by the CTMA transferred the gear at the Friendship Bridge on the frontier.
- 16 April The rest of the team - Bonington, Curran, Fotheringham, Lowther and Porter set out for Kathmandu.
- 19 April. Team Reaches Lhasa to be joined by Dawa, our Liaison officer and Pasang our interpreter.
- 22 April. The team set out from Lhasa in three land cruisers with a truck carrying the expedition equipment to reach Naqchu.
- 23 April The team reaches Diru
- 24 April The team reaches the road head at Yuchong - 4073m.
- 28 April Team sets out from road head to reach Gyolong, a pleasant park land with scattered copses of juniper by the river Kichu.
- 29 April Camped about an hour's walk beyond the Samta Monastery in the Sa Nang.
- 30 April Reached base camp at the south end of the Samsu Taring
- 2 May Held Pujah and then made first recce. Porter, Lowther and Clarke climbed 5600 metre hill to the south east of base camp to get views of face, while Bonington and Fotheringham visited the hermit living at the foot of the Thong Wuk and then followed the glacier to see if there was a possible route behind the North East Face of Sepu Kangri.
- 4 May Start recce of Col leading to the western aspect of Sepu Kangri, camping on the northern side of the Thong Wuk Glacier at 5050m.
- 5 May The climbing team reach the Col to the north of Seamo Uylmitok up deep snow and breakable crust and in face of poor visibility and deteriorating weather retreated to a hummock three hundred metres

below the col. There did not seem to be a reasonable route approaching Sepu Kangri from this aspect.

- 6 May Return to base camp
- 7 May Fotheringham, Lowther and Clark with the Sherpas shift dump of equipment from the north side of the glacier to the other side to below the north east ridge of Seamo Uylmitok
- 9 May Camp 1 established at 5150m
- 11 May Route fixed to site of Camp 2 at 5575m.
- 14 May Fotheringham and Porter move up to Camp 2 and push route out about four rope lengths.
- 15 May Bonington and Lowther move up to Camp 2.
Fotheringham and Porter push route onto North East Face up to 8850m
- 16 May Bonington and Lowther push route up to 6050m, a possible site for Camp 3, up long snow slopes to the point where it would be possible to traverse left across the face and reach the col. It would probably be a three day push to the summit from this point.
- 17 May. The team dropped back for a rest at base before final summit push.
- 18 May Heavy snow fall - probably two feet on the face,
- 26 May Camp 2 cleared of all gear.
- 27 May Departure from base camp.
- 28 May Reaching road head and by jeep to Diru
- 30 May Reaching Lhasa
- 3 June Flight to Kathmandu
- 5 June Flight to Karachi
- 6 June Flight to Manchester.



Our Tibetan Neighbours

Our team of twelve, British, Nepali and Tibetan nearly outnumbered the locals, nomads of the lake shore, who eked out an existence through winter and summer as yak and goat herds. Our neighbours combined natural inquisitiveness with reserve, and honesty. We soon knew most by sight, even in the distance - the hunched gait of Dorbé, a yak herder and stonemason, bent under load of wood as he



Tsimi and her husband Karte in middle with parents either side outside their home.

walked across the frozen lake, the gaunt profile of Oser, a grandmother as she waved from the brow of the hill above camp, the amble of Karté, her 40 year old son, and the skipping and laughing of his sisters' children. Our relationship developed a degree of intimacy, partly because of our proximity, and our reconnaissance of 1996, but also because of serious illness. Karté's wife, Tsini, was ill, which was to dominate the first weeks of Charles Clarke's stay in the region.

"We walked up the track towards the house, past a wall of prayer stones which were immaculately carved, through the yard where two guard dogs half-slept, in chains. Twenty-two kid goats, a few days old, played in a wicker enclosure. The children cuddled them, their live teddy bears. In return the kid goats sought out eagerly their mouths and tongues for nipples.

Oser, Karté's mother was roasting barley over sand. His sister Kokor, who lives in a ba, a felt tent, across the lake with husband and five children was turning the grindstone, to make tsampa from the barley. Karté's other sisters were away. Choe-Don, 'the one who went to school' was in Amdo, a two day drive and three day walk away. Karté has the phone number of her office. I suspect she does not wear the coarse sheepskin robes, the long plaits, the embroidered felt boots, necklaces, dagger and silver belt decorations of her sisters. Perhaps Choe-Don has begun to lose her nomadic roots. Tsesum-Dolma, with her three children, lives across the lake, too, near Kokor, tending yaks, while Yungdu-Lhamo, the youngest sister is helping her father plough fields in Pangar, a two day horseback ride away.

The single room within the stone hut is dark and smoky. A goat, due to give birth is by the hearth. In

one corner there is a simple shrine, of butter lamps, with one photo of an incarnate lama, beside another, incongruously, of the secretary of the Tibet Autonomous Region. In the gloom there was a woman lying on a bench, which serves as bed, chair and table. She was in great pain and gravely ill.

Tsini, who is thirty-one, had been unwell for two weeks. She and Karté have been married some twelve years, but have no children. The combination of vaginal bleeding, a period late by three months, severe abdominal pain and a mass in the left side of the pelvis pointed to an ectopic pregnancy - an emergency usually requiring surgery.

Long ago I had to make a decision about surgery and expeditions. First, I am not a surgeon: I am a neurologist. Secondly, the scale of equipment required to anaesthetise and operate, for broken bones, for abdominal emergencies, and so on would hamper an expedition, and would often, in itself, be hazardous. Finally, having been at it, in expedition mountaineering since 1962, I have not been caught out - until now. I thought long and hard about Tsini. My first advice was to take her to Diru, the county hospital. It was a two day horseback ride, followed by a day in a jeep. Tsini was far too ill for this, her family pointed out. So I chose a combination of antibiotics, and spoke frankly about my fears. I really thought she might die. 'Just do your best...we do understand' said Oser, through Pasang, our interpreter, as we stood outside, in a snow squall.

Five days went by. There was little if any improvement. The mass in the abdomen grew larger, like a hard orange. I felt uneasy about the diagnosis. I wanted advice.

In this world of instant communication, on this expedition we have a Mobiq, a British Telecom satellite phone. I tracked down a colleague, Marcus Setchell, a senior obstetrician and gynecologist at Bart's. You don't need the Cultural Revolution to close great institutions, I thought. I caught him in his office first thing one morning. Marcus combines sound advice with the ability to be rattled by no one, be they rich, royal or arrogant (or, often, all three). I could picture him, calm, bespectacled and attentive, at his desk. He took my call as if he was dealing with an entirely routine problem. To my relief he agreed with the diagnosis and management, but added something more - if Tsini she could survive the initial illness, which in a sense she had begun to do, there was hope for improvement. 'Couldn't we get a helicopter?', he asked. 'Not even for ourselves, I'm afraid', I replied.

Next day, she was worse. 'They say she went dead in the night when she stood up', said Pasang. The fever was higher and the pain intolerable. I began to use heroin injections, our strongest analgesic, and changed antibiotics. I passed a needle into the mass to see if it was an abscess: it wasn't - no puss came out. I toyed with the thought of operation under local anesthetic on the mess tent table, and thought of Tsini dying - and her burial. 'How do they do that here?' I asked Pasang. 'Chop, I think so', he replied grimly - the sky burial when the dismembered body is given to the birds. I hoped, and almost prayed. Tsini spent the day asleep. I carried a load up to Camp One.

On our next visit, the tide had turned. She looked less pallid, the pain had improved and the mass was slightly smaller. I felt a sense of guarded relief, and on a daily basis hope that it is all over.

Today a monk who had travelled from the local Samda Monastery chanted mantras and beat his drum, beside a tray of tsampa figures and votive lights. Tsini smiles now, and walks a little, and, I was glad to note ordered her husband to pass her some tea. A taste of things to come, I thought.

Our other neighbours also became regular visitors. Dorbé was a slight and shy man of about 35, with large ears, and a left eye blind from childhood. A widower, he was bringing up two young sons and a daughter, and was entirely reliant upon his two yaks, eight *dis* (the females) and a few goats. As a hobby he carved stones, which he had done for fifteen years. A *mani* wall was growing beside his house. He told us he was keen to become a monk,

and join the Samda monastery but he would have to wait until his children grew up.

Across the lake lived a hermit, Sam-Ten-Tsokpu. His house was perched on a hill above the frozen waterfall below Camp One, looking up to The Turquoise Flower. Sam-Ten-Tsokpu was a solitary man, but by no means a recluse. 'Do not be angry with one another, respect nature, do not kill, and be aware of the dangers of the mountain', he told us. Sam-Ten-Tsokpu was 33. He came from Chali-Chu, south of Sepu, a five day journey, a village which we visited during our 1996 reconnaissance. He had studied at the Samda Monastery and asked to take up residence in the house which in generations past, had been a hermitage. The original building did not survive the Cultural Revolution. A lama was killed here, he mentioned. He has been in residence four years, winter and summer, the first hermit for over thirty years. His relatives brought food - *tsampa* and tea, twice a year, and our other neighbours made donations.

Few expeditions have the privilege of being able to relate so closely and so quickly to their mountain neighbours. We had caught a glimpse of the Tibetan nomads, whose way of life has altered little despite the changes throughout their land.



Sam - Ten - Tsokpu, the hermit living alone below Sepu Kangri.

The Team

Climbers



Sir Christian Bonington, C.B.E., leader, 62, is a writer and lecturer and Britain's best known mountaineer with forty years of climbing amongst the world's mountains. He has written eleven books, has taken part in many television films and is currently President of the Council for National Parks and President of The Alpine Club. He is former president of the British Mountaineering Council.



Jim Fotheringham, a dentist, has climbed in Europe, North America and the Himalaya, making the first ascents of Thui III in 1979, of the West summit of Shivling in 1983 with Bonington, Rimo III in 1985 and Rangrik Rang in 1994.



Jim Lowther, a land manager, has climbed and travelled in Greenland over a period of ten years, was also in Greenland in 1993 with Bonington and Little when they made five exciting first ascents in a hitherto unexplored area on Rangrik Rang in 1994.



John Porter, a manager with Cumbria TEC, has climbed in most parts of the world with first ascents of the N. Face of Bandaka in 1977, S. Face of Changabang 1978, S. Face of Ranrapulka 1979, Everest in winter 1980 - 81, S. Face of Tarke Kang 1982, attempt on NW Ridge of K2 1986, Kedar Dome 1988 and the first ascent of Chong Kumdan 1 in 1991 among his climbs. He is a former editor of Mountain Magazine and former Vice President of the British Mountaineering Council,

Support team



Dr Charles Clarke, a consultant neurologist, also specialises in mountain medicine and has climbed extensively in the Himalaya. He was expedition doctor with Bonington on the ascent of the South West Face of Everest in 1975, on Kongur in 1981 and on the North East Ridge of Everest in 1982.



Jim Curran, climber, film maker and author has made several award winning climbing films including Kongur, K2 Triumph and Tragedy, The Unknown Mountain and most recently filmed and presented a series of climbs for the BBC's 'TRACKS'.



Duncan Sperry, a specialist in Internet communications, started climbing in the Lake District in the early seventies, was quickly leading the classic extremes of the period and gaining a grounding in Alpine climbing. He has climbed in Nepal on the South Face of Mt Api, extensively in the Rockies, and made an attempt on an early winter ascent of Mt Mckinley.

Nepalese Staff



Dawa - High Altitude Porter
From Phakding in Khumbu - married with one child.
3 Expeditions to Everest, reaching 8600m, Kanchenjunga (8500m), Ama Dablam and various trekking peaks .



Nawang - cook
From Bedding, Rolwalling - married with one daughter
5 Everest expeditions, highest point 8600m, Summited Manaslu and Cho Oyu, 8050 metres on Daulagiri.



Pemba - cookboy
From Dimbule, South Sola

Tibetan Support



Dorge - Liaison Officer
From Lhasa. Married with one daughter.
Works for CTMA. Studied English at night school and has visited Dahramsala. Has been interpreter and liaison officer for treks and Everest Expeditions.



Pasang - Interpreter
From Lhasa. Married with one daughter.
Learned his English in India. Works for TIST. Accompanied Clarke and Bonington on their reconaissance.

Communications

Communications on the expedition had to achieve several objectives:

to transmit expedition reports and digital pictures back to the UK for dissemination across the Internet (worldwide web) via www.bonington.com. This had to be deliverable pre-expedition from Lhasa; whilst the expedition was mobile during the drive across Tibet; during the walk-in to Base Camp, from Base Camp itself and from as high on the mountain as was practicably possible.

to be able to conduct live interviews with sponsors and media on all phases of the trip.

to have worldwide electronic mail available to all members of the expedition.

to have walkie-talkie radio connection between all camps on the mountain and Base Camp. Given the complexity of the North Face of Sepukangri it was deemed that a degree of non-line-of-sight transmission would be needed.

as we were a green expedition, all items of equipment should be able to run on solar power alone, either each stand alone or all in tandem. There should also be the facility of 'after sunset' ability to transmit

In all respects these objectives were achieved at least at a minimal operational level or better.

Given the physical remoteness of the region, the only viable communications medium was satellite transmission for both voice and data. The challenge was to have a fast transmission speed that delivered reports and high resolution digital images speedily and with integrity, yet was lightweight, compact, and could be operated in a remote environment whilst the expedition was mobile and on the mountain. As it happened, we chose to take with us two quite separate applications with two separate satellite transmission systems:

a high speed data link for static operations running at 9,600kbs/sec

a lower speed data link for mobile and mountain operations running at 2400kbs/sec

Pre Expedition set up and administration

The purpose of this section is to give the reader who is interested in using such a system for expedition or other work a sense of the issues and timescales involved

Initial planning with no real prior knowledge of such applications started in November 1996, was agreed in principle by early January 1997 and

implementation was executed from January to, eventually, April 14th, one week after the advance party of Sperry and Clarke left!

See Appendix A for the planning schedule.

Having decided that satellite air time was to be the transmission medium, the challenge was to create the technology and applications to enable

the transmission of reports and digital pictures from Tibet via satellite to the Internet such that they would be available to the world on the bonington.com web site the same day.

Planning

The best technology will not deliver without communications airtime. Two strong recommendations to be made at the early planning stage are:

decide how pivotal communications is to your sponsorship strategy before you approach sponsors.

if comms is to play a big role, establish a significant budget and start negotiations with communications airtime providers. This could either be satellite or cellular comms for certain areas of the world. For regular and extensive support by the expedition to sponsors and to maximise media coverage of your expedition, I would recommend a budget of some 2 hrs per day air time for the period you wish to transmit.

From early February the challenge was to procure all the computer, communications and power equipment, procure and/or create the software to drive the applications required for a Tibet-to-Internet solution and integrate the whole into an efficient system that would bring value and benefit to our sponsors on a daily basis throughout the expedition. One can have the luxury of a little self righteousness after the event: we, in retrospect, left the airtime planning, budgeting and acquisition uncomfortably late.

In discussions with Inmarsat, we became aware of a new lower speed, lower cost satellite communications media called 'Mini-M'. Running at 2.4kbs/sec, it is much slower than conventional so-called high speed



Chris working with the Apple Newton 2000

data terminals which typically have a transmission speed of 64kbs/sec for the larger base stations or 9.6kbs/sec for the more 'portable' versions.

At the end of 1996, British Telecom (BT) were just about to launch their Mini-M service. BT formed a joint venture with Nortel (Norway Telecom) to exploit this service and adopted Nera's laptop-sized satellite terminal for data and voice transmission, branding it "Mobiq". BT launched this in January 1997. Chris and I attended the launch in London and were suitably impressed by the Mobiq's compactness and portability. Sandy Gaul, the broadcaster, had recently used one in Oman and gave us a good report on its reliability and ergonomic ease. This would be ideal for our mobile operations.

The Satellite and Maritime Division of BT saw the potential for the expedition to give appropriate exposure and field testing to their Mobiq service and sponsorship for sufficient airtime to cover the expedition was secured in February 1997, together with two Mobiq voice/data sat-phones.

BT's airtime and Mobiq sponsorship included both high speed and low speed data transmission. The Mobiq service fulfilled our plan for remote communications but we perceived that we would need a high speed data terminal for Lhasa and for Base Camp.

Overtures to Inmarsat had not proved productive; not through lack of will on their part but simply that all their loan stock was prior allocated. Approaches to Inmarsat need, I suggest, six to eight months lead time.

At the Mobiq launch, Rohan Chanmugan, General Manager, BT Aeronautical and Maritime Division, under whose aegis falls BT satellite communications, referred us to Nera, also the manufacturers of the high speed data terminals.

In early March we secured agreement from Nera for the loan of a Saturn BP 9.6kbs/sec data terminal for such operations.

Systems Integration

The next task was to devise and procure the hardware and applications for capture, manipulation and dissemination of pictures and information from Tibet via satellite and onto the Internet. The host website was www.bonington.com. This site, and e-mail facilities attached to it, is hosted by Lakes.net in Kendal.

Pictures and text had to be made available 24hrs per day to the site from both mobile and static sources in Tibet.

From static source

This was the easier of the two delivery systems to create. The architecture was as follows:

TEXT: >>> APPLE POWERBOOK; CLARIS EMAIL >>>> NERA SATURN bp >>> Indian Ocean region satellite >>> UK base station >>> land line to Lakes.net server (dial in service) >>> ftp to Rupert for integration into web site.

PICTURES:>>> OLYMPUS DIGITAL CAMERA >>> direct connect to APPLE POWERBOOK; select and sort on OLYMPUS software; port selected shots into ADOBE PHOTOSHOP, manipulate images for upload and create send file; send as attachment with captions via CLARIS EMAIL>>> NERA SATURN BP>>> (as above)

The major problem we encountered was the interfacing of the Apple Powerbook to the Saturn BP. Our plan was to use a 64kbs/sec (64,000 baud) high speed data terminal but we quickly realised that the serial interface from the powerbook only runs at 9600 baud. Connection of the serial interface proved problematic and was only completed by direct support from Apple engineers.

This may well have been due to my engineers being unfamiliar with the MAC operating system but we would advise anybody considering such MAC-to-Saturn connectivity to consult Apple in the early stages.

From Mobile source

Sending pictures and reports whilst on the move or from on the mountain requires compact and ergonomically-friendly hardware and software applications.

The BT Mobiq was designed with mobile voice and data in mind but given its data transmission rate of 2.4kbs/sec it was clear that a form of data compression for digital picture transmission was required, together with the means to decompress and re-format the images post transmission, prior to delivery to www.bonington.com.

At this point Logica volunteered to sponsor the development of such an application together with the provision of the service to de-compress and re-format.

This application, based on an Apple Newton, became known as "Tibet". Development engineering was done by Logica Cambridge but the major hurdle proved to be the connectivity of the digital cameras. Most digital cameras work on proprietary protocols and camera manufacturers seem corporately unable to release these for external development purposes. Also, power consumption (i.e. batteries) had to be minimised for mountain operations. The greatest consumer of power is

actually the on-line edit function on cameras with an 'edit window' in the back. Agfa manufactures a camera without this facility with very low power overhead and were very supportive in making several of these available, together with the appropriate protocol specification for Logica to develop the interface to the Newton. However, without the on-line edit facility, anybody taking photos with the camera would have to remember which one's were good enough to be downloaded into 'Tibet' or, by default, download all shots in the camera; thus defeating the object of compressing selected images.

Logica's application was ready in its raw state by early February but detail revisions, communications integration and resilience testing ran up to leaving date on 4th April. Logica's commitment to 'making it happen', and their support to our broader communications aims, was throughout this period exemplary and highly professional.

The essence of the Tibet application is to facilitate direct selection of camera-stored digital images, annotate simple captions or attach more complex reports to the images; compress the images and download them through the BT Mobiq via the Indian Ocean satellite to the UK where the compressed file is 'unscrambled' and transmitted to website as GIF file.

The interface between the Tibet application and the Mobiq proved straightforward.

Architecture is as follows:

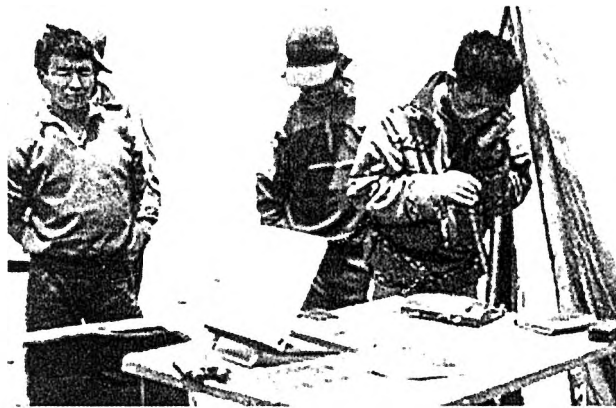
(AGFA) digital camera>>> (interface protocol)>>> Apple Newton with Logica Tibet application>>> BT Mobiq>>> Indian Ocean Region satellite on Mini-M service>>> Eil ground station, Norway>>> land line to UK, Logica Cambridge>>> Logica PC based descrambler>>> JPEG file transmitted via FTP (file transfer protocol) to rupert@bonington.com .

Hybrid

We thought it would be expedient to connect the Mobiq to the Apple Powerbook for transmission of non Newton derived data and email on Mobiq service. As it things developed in the field, this was the best decision we could have made.

E-mail

After some trials, we decided to manage all email accounts through one central server with one e-mail address: i.e chris@bonington.com hosted at lakes.net. This made for much easier administration in the field and privacy for team members was ensured by definining the recipient in the subject header on the e-mail.



Dawa calling Himalayan Adventures in Khatmandu to find out if any of his friends had died on Everest in the recent accident.

Communications integration

Final integration, testing and commissioning of all applications and communications equipment was done by Findhorn at their Chipping Norton premises in March and early April

Power source

A generator was considered for a brief period but logistics, fuel quality, reliability at altitude and by far the most vital consideration, the desire to minimise the expedition's impact on the environment, determined us to seek a solar derived power source. It is worth mentioning that a wind generator could also have fulfilled the criteria but would have required more than the available time to plan and execute.

For the solar power, we turned to Gerry Taylor & Associates of Berwick on Tweed. The objective was to allow us the facility of continuing to charge appliances, run applications and communicate with the outside world, simultaneously at all times; even 'off-peak' during darkness and in periods of low sunlight. This required a powerful charging capability to charge a 'reservoir' of power with a range of voltage outputs for all types of equipment. On the basis of this brief, Gerry Taylor produced his Solar Power Management Suite. This comprised of four large solar panels of 25 watts each inputting power into a central reservoir of two large lead acid batteries. Outputs ranged from 6 volts to 24 volts.

By this means we could simultaneously charge and run the following:

- Apple Powerbook for email and downloads to UK
- Two other laptops with Windows operating systems for report writing
- Saturn BP satcomms terminal
- BT Mobiq satcomms terminal

Olympus digital cameras
charge Sony movie-camera batteries
charge SMC walkie talkie batteries

Walkie Talkies

Walkie talkies were very kindly loaned by South Midlands Communications (SMC) of Southampton who have a long track record of support to adventurers and expeditions. This comprised of a Base Station (extended aerial) and three other sets for the mountain.

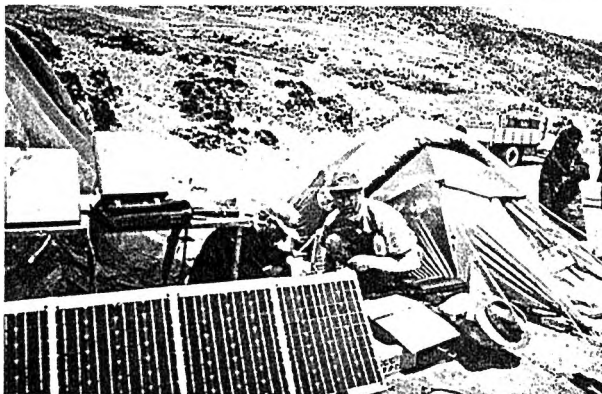
Field Performance

A summary of each area and application of the communications programme follows:

Satcomms

The star of the show was undoubtedly the Mobiq. Its ability to search, seek and lock onto the Indian Ocean Region satellite was excellent. For ergonomics and ease of use, especially whilst mobile or in inclement weather, we could not have wished for anything better. One can even use it tent-bound during storms, placing the antennae outside the tent or ice cave and operating the transceiver from the warmth of one's sleeping bag. The downside is the speed of 2.4kb/sec only. However, for reports, email and the Tibet application (with its inherent data compression) this matters little. The limitation came in downloading large, high resolution JPEG files of digital images via the Apple Powerbook as attachments to Claris Mail. We overcame this to a great extent by reducing the resolution and changing the size of the images on Adobe Photoshop prior to transmission.

The downloading of digital images was supposed to have taken place via the Saturn BP. However, we found the resilience and integrity of data transmission poor compared to the Mobiq. It was preferable to run at a slower speed on the Mobiq than to risk interruption of a transmission on the



The 100 watt solar panels in foreground with the two BT Mobiq dishes immediately above at the road head

Saturn.

It has to be said that the Saturn is technologically and ergonomically of a different age. Apart from its transmission performance, packing it and transporting it, especially in inclement weather, was a challenge in itself. There is no reason why current technology should not be able to package a high speed Mobiq-sized satellite transceiver and we look forward to such a development!.

Applications

Claris E Mailer, ClarisWorks, Adobe Photoshop and Olympus C1.OME all performed well, were easy to use and most importantly, easy to learn to use. By the end of the expedition every team member (some of whom had not touched a computer before) were happily using these applications.

The Logica Tibet application was excellent but its use was curtailed on the expedition by the fact that the Agfa digital camera did not have an on-line edit facility. All we could do therefore was to download all pictures in the camera, good or bad. Expecting someone at altitude to remember which pictures are likely to be good or bad is rather optimistic!

The Tibet application is a great start and we will continue to work with Logica to enhance and expand its functionality and applicability.

Computer Hardware

The Apple Macintosh PowerBook1400c was used at base camp for E Mail and downloading pictures. The CD drive was used for an addictive strategy game called Warcraft. Its ease of use and reliability made it the ideal machine for this purpose.

The Apple Newton Message Pad 130 was used on the mountain for sending images and text through the BT Mobiq. This small palm top is light, compact and very rugged. Bonington dropped his rucksack with the Newton in it on the way down and it tumbled about a thousand feet, but was still working after the fall!

Solar Power Management Suite

Without the ingenuity of this equipment we simply could not have operated. As with the Tibet software, this concept has a long way to evolve but represents the future of power management on expeditions. The energy input serviced our power needs at all times using the reservoirs mechanism. On occasions there were four people in the communications tent using equipment drawing power. As with Logica, we shall be working with Gerry Taylor to enhance and develop his power management suite

SEPU WEB

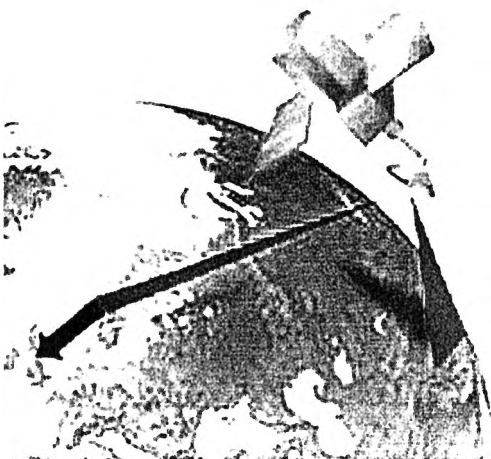


The expedition web site proved a huge success, far greater than we had anticipated. We had over 400 000 hits to the site.

We received over 1000 emails wishing the team luck and congratulating us on the look and ease of use of the site.

The updates were on a daily basis, sending text or pictures.

We had hoped to include live video, but this will have to wait until next years trip!



Sponsors and Suppliers

We are most grateful to the following for their support.

Main Sponsors

Claris
Silva
Coleman
Sealy
Cumbria Tec
International Powered Access Federation

Grant aid

Mount Everest Foundation
British Mountaineering Council

Suppliers

Berghaus -	Supply of all clothing, rucsacks and walking boots
Logica -	Design of communications system software
Cascade Designs -	Supply of Therm-a-rests and seats
Terra Nova -	Loan of tents
Ever Ready -	Supply of range of Lithium batteries
Olympus -	Supply of Digital cameras
Agfa -	Loan of digital cameras
Apple -	Supply of PowerBook 3400 and Newton 2000.
BT -	Loan of BT Mobiq and satelite air time
Nera -	Loan of Saturn bp
Lyon Equipment -	Supply of fixed and dynamic rope.
GT Associates-	Design and supply of Solar Panels and Power suite
South Midland Communications -	Loan walky talky radios
Findhorn -	Communication integration
Pasteur Mérieux MSD -	Immunisations
The Pharmacy -	Drug Supplies
<i>National Hospital for Neurology & Neurosurgery</i>	
Dr Gil Lea -	Advice
<i>Public Health Laboratory Service</i>	
RoC UK -	Sun Protection
CE Bartlett Pty. Ltd	Portable altitude chamber

Support

Louise Wilson & Margaret Trinder -	Secretarial for Chris Bonington
Frances Daltrey -	Pictures
Rupert Bonington & Paul Batey -	Web design & Administration
Ann Tilley -	Secretarial for Charles Clarke
Dr Jim Duff	Advice

Travel

Himalayan Kingdoms
Himalayan Expeditions
China Tibet Mountaineering Association



EXPEDITION REVENUE ACCOUNT

TIBET 1997

FINAL - 04/08/97

	\$	£	\$	£
<u>PRE EXPEDITION COSTS</u>				
CTMA quote		17,356		
CTMA peak fee		8,943		
TIST fee (1996)		1,263		
Him agency fee		625		
Flights UK/Kath/UK		3,430		
BMC insurance		903		
Specialist gear insurance		312		
Admin costs - CB office		2,000		
Mountain food		388		
Air freight UK/Kath (471 kg @ £1.96/kg)		912		
Medical		1,021		
Solar panels		2,500		39,653
<u>EXPEDITION COSTS</u>				
<u>In Nepal</u>				
Kath Liason (Bikrum)	750			
Tentage and cooking rental	800			
Truck Kath/Friendship Br/Kath	600			
European visas	525			
Nepalese visas	210			
HAP wages (Dawa)	399			
Cook wages (Nawang)	273			
Cook boy wages (Pemba)	231			
Equipment Dawa	1,100			
Equipment Nawang	600			
Equipment Pemba	500			
Flights Kath/Lhasa/Kath (380 x 9)	3,723			
Hotel Marshyangdi	3,310			
Exped food bought Kath	1,392			
Excess baggage Lon/Kath	901			
Excess baggage Kath/Lhasa (200 kg)	88			
Airport tax Kath/Lhasa (7 x Rs700)	87			
Transit visas on return	30			
Extras	944			
Team expenses Kath	198		16,660	10,097
<u>In Tibet</u>				
Team expenses - Lhasa/Biru/Naqchu	2,064			
Khata Hotel	2,094			
Exped food	2,033			
Stamps	336			
Tips - general	106			
Tips - porters	950			
Excess baggage Lhasa	141			
Airport tax Lhasa	100			
Excess yak cost	1,013		8,837	5,356
<u>POST EXPEDITION COSTS</u>				
Border TV - Jim Curran		200		
Misc (weather forecast, carriage, report, dupes)		1,682		
MEF/BMC refund/donation		1,300		
Air freight Kath/UK		1,162		4,344
<u>TOTAL EXPEDITION COSTS</u>			<u>59,450</u>	

	£	£
<u>INCOME</u>		
Subs from members	12,250	
<u>Less: subs returned to members</u>	<u>-12,250</u>	0
Halvor Astrup		24,985
Silva (UK)		3,500
Claris International Inc		7,500
Coleman		5,000
Cumbria TEC		5,000
IPAF Ltd		5,000
Sealy		5,000
MEF		900
BMC		850
Cumberland News		700
Just Radio - Charlie Clarke		900
Kit re-sales (net)		115
<u>TOTAL EXPEDITION INCOME</u>		<u>59,450</u>
<u>SUMMARY</u>		
Total Expedition Costs		-59,450
Total Expedition Income		<u>59,450</u>
		<u>0</u>



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