

A Bad Day

(not feeling too good, actually)

Bill Wright

More concerned with the human than the technical side of TV aerial installation, this is a bit of light relief.

Part one Dawn to Dusk

At 7.15am the pain in my solar plexus had become severe enough to force me into full consciousness. I sat on the side of the bed in a cold sweat. Women who've reared children never really sleep, and within seconds Hilary called out 'You all right?' At first I couldn't answer, but feeling her concern grow I finally croaked the immortal line, 'Not feeling too good, actually'. With that I surprised us both by moving at uncharacteristic speed towards the bathroom, unfortunately depositing most of last night's supper on the carpet as I ran.

'Not a good start to the day', I mused, as I contemplated the bottom of the toilet bowl. There was a virus going round. That's what the wise women of the village said. My dad blamed it on Gastric 'Flu. 'That's what we used to call it, long time before they thought of these 'ere viruses', he told me. Whatever it was, it left me feeling pretty rough. This was my second bout within a week. The first time, I had been rendered incapable of eating, on the occasion of one of my mother's famous Sunday Teas. This was agony—tantalised by bread and dripping and Devil's Food Cake! Two days later, fully recovered—or so I thought—I hatched a plan to get my own back on Fate. I gathered together a small quantity of bread, dripping, and black pudding, and a few bottles of exotic Belgian beer, and settled down for a midnight feast. This was followed by a night of quite cheerful insomnia which ended at 5am. Two and a quarter hours later I was surprised to find myself face to face for the second time with the feast, only this time neither of us were looking quite as perky as before. I really did feel dreadful, more because of the lack of sleep than anything. For many people, a reasonable response to this situation would be to get the wife to ring in and say that hubby was indisposed, but there was

one problem: the self-employed are not allowed to be ill. What to do? What was I committed to that day? As an aerial contractor who earns most of his money on commercial, rather than domestic work, I am largely free of Joe Public and his 'I want it yesterday' attitude. But my diary is full of meetings and deadlines. After the usual half hour in the office I had a site meeting at 10.30, and then I was due to work on a new TV distribution system at a hostel. After that, a couple of routine calls for the local council. The site meeting was essential; the hostel was certainly urgent; the rest I would do if I could possibly could.

Why do the self-employed feel so guilty when they are ill? Not for us the secret smug joy of the salaried man, lolling at home for a fortnight with some painless complaint. Earlier this year I had a slipped disc. This is an agonising and crippling condition, for which the doctors prescribe 6 to 8 weeks complete rest. For a week and a half I endured a mixture of guilt, worry, and frustration, as well as the physical pain. Finally, against all advice, I literally crawled back to work, although whether I helped or hindered my able-bodied workers I don't know.

At 8.30 I was bawling down the phone 'If delivery time is a fortnight you should damn well say so to start with, instead of messing people about!' Two weeks earlier I had taken an order from a good and valued customer, Mr Gonzales. He is a supplier of audio-visual equipment, and when there is any RF distribution involved he calls me in. This was a follow-up to a previous job where we had installed a system in a government establishment about 80 miles away. The system allowed students all over the campus to watch live TV pictures from a nearby studio suite. Now they wanted four more channels, and it was urgent. Mr Gonzales was doing the baseband and audio part; my job was the RF. On the Monday I had

asked my supplier when I could take delivery of four modulators and four channel pass filter/levellers. 'Friday' . 'Excellent'. Accordingly I organised the job for the following Tuesday. This meant that two of Mr G.'s men were booked for that day, and we were all issued with security passes, for that day only. On Friday the gear didn't come. 'You said Friday!' 'Ohh, I never!' 'Did!' 'Didn't!' etc., etc...

Later, Mr G. was understanding. 'I have these problems myself', he commiserated. 'Don't worry about it. I'll smooth them out at the college'. A new, reconstructed promise was issued by my supplier. The goods would arrive the following Thursday. They didn't. Thus I was bawling down the phone first thing on Friday morning, wishing the taste in my mouth could be transmitted with my words to the recipient. Then I phoned Mr G.. Again he was understanding, but I think I heard a sharp intake of breath before he spoke. Maybe he'll use someone a bit more reliable next time, who knows?

A popular belief is that you should count to ten before you speak. I take the contrary view: sometimes a good hot blast of anger should be used to maximum effect before the furnace dies down. Accordingly I fired off a most abusive fax to the employer of the little tick I had just bawled at.

Feeling better in spirits if not in body I drove the twenty miles down the M1 to the site meeting. This was at a large hospital on the outskirts of a pleasant market town. I've looked after the hospital TV distribution system for some years. Two wards on a floor about half way up the building had recently been refurbished, so I had installed a thirty outlet addition to my distribution system, comprising a QC165 trunk cable running above the suspended ceiling, with Taylor TA-series tap-off units along its length. QC165 is the Ace equivalent of Raydex CT167. The riser which carries the trunk cable from the top of the building to the bottom is about 80m from the nearest point of the refurbishment. The signal loss on an 80m run of CT167 or similar cable is about 10dB, and taking that into account I needed something like +43dB/mV at the riser to feed the new additions. That was just about possible with a splitter, since there was +47dB/mV on the main trunk at that point; but I didn't fancy dropping the signal levels on all the floors below by 4dB. In any case, I knew that further ward refurbishments on other floors were in the pipeline, and each would eventually require a similar amount of signal. For this reason it would be wrong to simply pinch a bit of signal from the trunk. The tap-off unit in the riser on that floor was a one-port 15dB unit

which supplied the existing outlets. I replaced this with a one-port 20dB unit, feeding a mains-powered repeater amplifier with 20dB gain. This gave me 47dB/mV to play with, more than enough to supply the refurbished wards, and also the existing outlets on that floor via the same one-off 15dB tap, which I relocated on the repeater output. This solution pleased me because every outlet on the floor would be fed from the same repeater. I like to keep things simple and logical wherever possible. Large systems can become a nightmare to service if the design is just allowed to evolve over the years in a haphazard manner. I made a mental note to follow the same layout on the other floors as they came up for refurbishment.

I went to the riser cupboard to check that the repeater mains supply had been installed as promised, but this wasn't the main reason for my visit. With only four days to go before the prestigious new unit opened its doors to the public, someone had realised that several important 13A outlets and TV points had been omitted. The workers had known about it for months, but the men in suits do not listen to the men in overalls, so there we were with a minor crisis. The electricians wanted to know where to run the extra co-ax.

'Straight across, above the ceiling, from there to there', I said.

'Oh no, we can't take the ceiling tiles down now'.

I wondered for a moment why they would need to. It would be easy to rod the cable across from each end. Then I remembered—on this job all the TV cables had to be enclosed in 25mm steel conduit. Why? Because the architectural consultant said so. Were they enclosed in conduit anywhere else in the building? No, but that doesn't matter. Is there any sensible need to use conduit, at such expense? No, but it must be done because the consultant says so.

As if reading my thoughts, the electrician said, 'Seems barmy putting them in conduit. Still, it's their money'.

'No it isn't', I said, 'It's yours and mine'. On the same job all the wall plates were brushed steel instead of ceramic. I dread to think what that cost.

Having arranged to go back and fit the tap-off units and outlet plates after Sparks had somehow installed the conduit and the cables without wrecking the ceiling, I attended to a few minor jobs in other parts of the building. These were the usual boring items: a faulty flylead here, a mis-tuned TV set there. Things which, strictly speaking, are not the responsibility of the

TV system contractor. The best policy seems to be to keep everybody happy, though, and not worry too much about the exact terms of the contract. A bit of give and take is in order with an on-going job worth as much as this one. I find that the office staff in these large organisations value a quiet life above all else, and that it is in my long-term interests to help them achieve this nirvana, by pacifying their ward sisters, tenants, or whoever else might yelp at them down the phone. By noon I was sitting in the van with the kettle on (yes, I have a gas cooker in the van). I found that my stomach would not accept hot tea, but once the tea was nearly cold I was able to sip it. I felt quite well, to my surprise, so I decided to keep to plan and go to the hostel to do a bit more to their new distribution system.

As I headed back into Yorkshire I thought about the job, the building, and its history. Saxon House was a rather attractive 1920s mansion, converted in the early seventies into a home for 'difficult' children, and brutally extended at that time, with a flat-roofed monolithic slab of a residence block shoved on the side. Now it was a hostel for the adult mentally ill, full of poor suffering souls. Over the years I have installed aerial after aerial on the building, as their requirements for television have grown. After about the fourth one I started to routinely suggest that the institution should start afresh with a communal system. There were many sound reasons for this. Saxon House was in a leafy suburb, and the leaves caused serious reception problems. Eventually there were eleven aerials, and every year, in late spring, I would be called out to one or more of them. 'Of course, we don't expect a good picture in this area, but...' The Officer in Charge would gesture hopelessly in the direction of a TV set with rolling, ghost-ridden reception. One picture is worth a thousand words—he had no need to finish his sentence. I was always confident that with that an order for a forty-outlet system in my hand, funds would allow an aerial to be installed which would provide good, reliable reception. This proved to be the case, when this year the Officer-in-Charge found himself a few thousand quid below budget at his year-end. Now, as a tax-payer I deplore the public official's habit of spending money like a drunken sailor, just because he finds in late March that he can afford to do so. Every year there is an undignified scramble to get hold of an invoice dated no later than March 31st to soak up any remaining funds, even if the work isn't done until halfway through May. As an aerial contractor I do not deplore this behaviour, however.

An Antiference TC18B, at the top of a 20ft mast, was now producing an unvarying +14dB/mV. There was one massive brick chimney at the highest part of the roof and I had bolted the brackets to that. This had involved hauling a big ladder up onto the roof and tying it in place, but it had been worth it. The aerial was about 40ft higher than any of its predecessors, each of which had produced -5dB/mV at best, with wide variations between channels, and fluctuations from day to day. Although the trees weren't in leaf I was confident that the problem was solved. The new aerial was just higher than the trees in the direction of the transmitter. This was a piece of good luck, because there was no other location on the building which provided so much height, and at other locations on the roof the obstructing trees would have been much higher than any feasible aerial mast. I hope the trees are slow-growing!

Obtaining a good consistent signal had been the only problematic part of the job. With that out of the way it was just a case of installing a bog-standard UHF distribution system. The shape of the building—basically long and thin—strongly suggested the use of a 'trunk cable and tap-off' design. There was no likelihood that the system would ever be converted to carry satellite IF, so the system was planned purely for UHF. In order to keep costs down, and to minimise disruption inside the building, the trunk cable and tap-off units were to be externally fixed. Downleads were to enter through window frames, with surface-fix isolated outlets on sills. The ugly new wing had presented no problems, except boredom. 'Thank God for a good play on Radio Four!'—the cry of those who have to perform time consuming tasks which do not occupy the brain.

Now I was faced with the external part of the installation on the old part of the building. I didn't want to deface such a nice old pile with cables any more than was necessary, so the job was going to be fiddly and painstaking. The building had a complicated and intricate design. I could hide most of the trunk by running it on the wall close under the eaves—just as well because I was using Ace QC165, an 11mm diameter cable which would look pretty awful if it could be seen. At least it's black. I recently saw an external system done in Ace DB165, a lurid green cable which is meant for underground use.

Co-ax cables should not be forced into tight bends. In the case of these large diameter cables this means that the minimum bend radius is about 100mm, so the cable can't just follow a 90 degree brick corner. If the mortar joint is

wide enough it is sometimes possible to ease the bend by chipping out the mortar on the corner and laying the cable in the joint. Where the cable needs in any case to drop a small distance from one horizontal level to another it helps if the drop can be at a corner. It is always necessary to plan the cable route carefully, and on a difficult building I go so far as to sketch elevations with possible routes marked up.

The tap-off units were concealed under the eaves. Each download presented a different problem. In some cases ivy provided concealment, but often all that could be done was to fix the cable as neatly and discreetly as possible. Large areas of wall were finished with hanging tiles, which had to be skirted around. The top surface of Mock-Tudor beams provided several good cable runs, invisible from the ground. Strangely enough, this fiddly, thoughtful work suited me in my weakened state. The rate of physical work was low, since the rate of 'messaging about' was high. Lunchtime came and went, but eating was out of the question. At about three o'clock I remembered a bottle of Lucozade, somewhere in the rubbish on the van floor. This was left over from the previous digestive upset, and it went down very well. At that point I was quite pleased with what I had achieved. As I sat on the back step of the van, sipping the glucose, I decided to do another hour, then go home and go to sleep until it was time to go to bed.

The Officer-in-Charge looked out of his office window and saw me slacking. He rapped on the window and indicated that I should approach.

'When will you get to rooms 30 and 33?', he asked.

'Next week, all being well', I said, uneasily.

His reply confirmed my fears. 'Look, could you do me a big favour? Those two lads are desperate for their telly. Could you do them now?' I got the impression that my compliance would greatly assist him in his pursuit of the quiet life. The part of the job I had been looking forward to the least was rooms 30 to 34. These rooms were in a detached annexe about 15 metres from the main building. The plan was to take a cable across on a catenary, and then fit tap-off units in the loft of the annexe. The existing built-in downloads would be re-used, but with new isolated outlets fitted. I definitely didn't feel like doing rooms 30 to 34 at that moment. But if these lads were desperate for their telly... The trunk running along the back of the main building had by then reached the point where the catenary would be anchored, and a 12dB tap, used as a spur unit, fitted ready to

feed it. As it happened I had catenary brackets, tensioners, and wire in the van. So I cheerfully agreed to do rooms 30 to 34. Flying the cable across to the annexe was quick and easy. Then the fun started. Daft as it sounds, it took over half an hour to get the cable through into the loft. I drilled upwards into the underdrawing and pushed the cable through the hole. It's usually fairly easy to pull it up into the loft with a bit of lashing wire with the end bent into a hook, but not this time. The wall had been built up between the rafters, until it touched the underside of the slate roof. The roof turned out to be very well built, with every slate tightly nailed. In the end I took the cable round the corner and in though a hole drilled in the gable. By this time I was feeling frail. The sudden acceleration of physical effort, repeatedly climbing the ladder and running up the stairs, had done me no good at all. The cellphone rang. 'No reception, all dwellings, Eldorado Estate. Attend immediately, natives are revolting' Oh, great. Just what I need.

One thing this job has taught me is to deal with things one at a time. I would do everything in my power to make the desperate lads a bit less desperate. Then, and only then, would I start to think about the Eldorado and its revolting inhabitants. In the hot, dusty loft I fitted a two-off 15dB tap, a length of trunk to reach the far end of the building and a two-off 12dB tap with the all-important end-of-line 75W termination. Despite my best efforts to avoid it, the glassfibre insulation made contact with my skin, bringing up the usual soreness and rash. I fitted the new outlet plates, and as I re-tuned the desperate lads' TV sets I felt like death. But they were so absurdly grateful that it was worth it. It was six when I got away from Saxon House. My blood sugar was at an all-time low: I felt light-headed and it crossed my mind that I would have to drive very carefully. I realise now that I shouldn't have been driving at all. I stopped at a chemists', bought some more Lucozade, and set sail for the Eldorado with gritted teeth and Mozart Symphony No. 40. The first movement stimulates adrenalin: good music for going into battle. And I knew for certain that I would have a battle on the Eldorado.

Part two Nightshift on The Eldorado

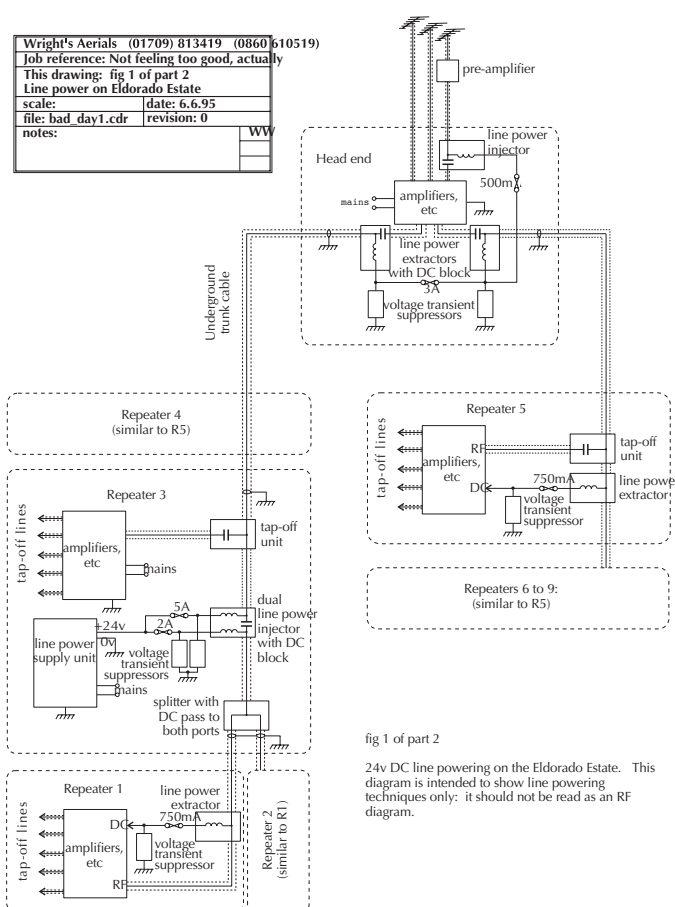
In Part One, Bill Wright told how he staggered through the day, weakened and demoralised by a bout of gastric flu. Just as he was heading for home, he was called out to a large communal aerial system on a very rough estate...

The normal rules for working on the Eldorado are as follows: Go mob-handed. One to do the work, one to cover him, and one to guard the van. Always go in the morning. The kids will be at school (some of them), and the alkies and druggies will be sound asleep. If it's raining, all the better. Never go when football is on TV. Never, ever, go after dark.

This time, I had to break the rules, and it would be particularly dangerous. I was alone; it was dusk; and the whole of the TV system was off: every dwelling had no reception. Television, the opium of the masses, was not available. These people would have severe withdrawal symptoms, which would make them irritable and violent. To make matters worse, the evening was warm and dry. People would be out and about, looking for trouble. Any tradesman, arriving at a breakdown which is causing large numbers of people great inconvenience, feels like the US Cavalry coming over the horizon to rescue the wagon train. The residents of the Eldorado don't see it like that. I am not seen as their salvation, but as the cause of their problems. Somehow, I am to blame for the breakdown, and it doesn't matter how fast my response, every television-less minute is my fault. The irony is that nine times out of ten the breakdown is caused by vandalism or theft, committed by the Eldorado-dwellers themselves. I could expect effing and blinding, objects thrown at the van, and threats of assault. And I didn't feel very well. As I turned into Arthur Scargill Way I wondered if this moment was the nadir of my career. No, that was the time when I found myself doing a cheapy aerial rig for a national rental chain at 11pm in the pouring rain on a three-storey building in Barnsley, with severe reception problems, a faulty meter, and a customer who was pretending not to understand English, especially the words 'Pay up'.

I have to tell you something about the Eldorado Estate, or what follows won't make any sense. Built in the late sixties, when architects thought they could do no wrong, and stupid councillors encouraged them in that belief, the EI is a cluster of about four hundred low-rise dwellings on a hillside. Flat roofs, the uniform concrete

appearance, the elevated patios, and the sloping site, all conspire to give the place a faintly Middle-Eastern look. So the EI was always known as 'Jerusalem', but in recent years this has changed to the more appropriate 'Beirut'. At first it was regarded as a model of good, modern design. Some of the older residents tell of coach parties of architectural students coming up from London for a look, in the early days. But soon the practical disadvantages of the place became apparent. Access to most dwellings was very difficult. Elderly people would totter along sloping grassy banks to reach their flats. The strange design meant that the patios of the family houses, with motorbikes and rotweillers, were above the bedroom ceilings of the elderly people on the ground floor. There were no private gardens; nowhere safe to park a car; nowhere safe for the kids to play. The irregular layout and endless nooks and crannies made the estate a dangerous place at night. The architects had produced all the problems typical of sixties high rise, on a two storey development! Eventually most of the decent people moved away, leaving just a small nucleus of respectable residents surrounded by every kind of low-life. Then, a few years ago, the EEC heard about the place, and decided to throw money at it. The Eldorado Estate Renewal Project was born. Now we have chaos. The place is a vast building site. New roads are being constructed, and all the



blocks are either being tarted up or pulled down. The tenants are not being moved out during 'The Works', so old ladies slide into muddy holes with monotonous regularity, and the builders can't put anything down without having it pinched.

The communal TV system is essential on the Eldorado, because off-air reception is terrible. When tenants do put their own aerials up, the unique architecture means that they are soon stolen by the neighbours, because it is possible to climb anywhere on the buildings without so much as a step-ladder. The system has a head-end at the top of the hill, with the aerials on a 60ft lattice tower, which is festooned with barbed wire. As well as the four local channels, two remote ITVs are carried. From the head-end two trunk cables go down the hill, one on each side of the estate. Different grades and makes of cable are in use, varying from 9mm to 14mm diameter. The trunks feed repeater amplifiers, which are dotted about in the 'voids'—long spooky concrete caverns which run along under all the blocks. Mains power is available at the head-end and at Repeater 3 only, so all the repeaters except no.3 are line powered. A power supply unit at Repeater 3 provides 24v DC, which is carried on the co-axial trunk cables to all the other repeaters. Power is extracted at each repeater location via a line power injector/extractor, such as the Teleste CM9027. This item is basically a choke connected to the co-axial inner, fitted in a diecast box.

The head-end was originally at the Repeater 3 location, because that part of the estate was built first. When the head-end was moved up the hill to its present location someone obviously decided that the line power supply unit could stay where it was. Normally the line power would originate at the head-end. Line powering is normal practice when active equipment has to be installed in places where a mains supply is not readily available, although 55v AC is more commonly used than 24v DC. Line powering can be a bit of a nuisance, being responsible directly or indirectly for a lot of unreliability. Systems with line power are very vulnerable to voltages induced by EMP during thunderstorms. Vandalism or tampering can easily short out the line power and cause a widespread loss of reception. The trunks on the Eldorado were all underground originally, but over the years some of them have been replaced by overhead links. This is because the cables had become very 'lossy', due to the gradual ingress of moisture. Increasing signal attenuation on coax due to moisture is a slow but relentless process. You

would think that the outer sheath of coax would be completely impervious, but this is not the case. Damp gradually permeates through the sheath, and then migrates along the cable. Cutting into the trunk cables on the Eldorado reveals a black powdery substance on the braid, and a yellow discolouration of the inner insulation. There is rarely any sign of actual dampness in the cable, but the RF performance suffers greatly. I kept a chart showing the gradual deterioration of each main cable over a ten year period. A theoretical loss of 4dB on the ch51 audio carrier would measure as 9dB in 1988, 14dB in 1990, and so on. To a certain extent it is possible to compensate for these increased losses by upping the amplification, but there are limits. Usually the losses are more severe at higher frequencies, leading eventually to the need for impossible amounts of slope compensation at each amplifier. On the Eldorado system the channels in use were originally 29, 41, 44, 47, 51, and 61. By 1992 the ch61 signal all but disappeared at the bottom end of the estate. I fitted a channel-changer at the head-end, and thereafter Central ITV was distributed on ch25, with much better results. The worst affected cables are the ones with the foam type of dielectric. The damp has no significant effect on the line power, incidentally. Special cables are available for underground use, with an integral moisture barrier. These should always be used for underground routes, despite the extra cost. The moisture barrier normally consists of an aluminium sheath over the braid. Some of the Eldorado cables have moisture barriers; some don't.

During the building works I have had an average of one emergency call-out each week to the Eldorado. That's if you class the loss of TV reception as an emergency. Personally I have my doubts. I mean, it's not exactly life-threatening, is it? Mind you, if you heard the hoo-hah that comes from the Eldorado when the system goes down you'd think they'd had their oxygen cut off. The district heating can go off in the middle of January and they don't make half as much fuss.

The builders used the voids for storage for a short while, so most of the void doors were forced open by thieves. This let the vandals in, who attacked the repeater amplifiers and tap-off lines. This time, however, the damage was outdoors and clearly visible as I drove onto the estate. A number of blocks have been demolished to make way for roads and paths, and where these blocks have supported overhead trunk cables, the cables have been left

on the ground. They are all to be replaced with new underground cables eventually, but that part of the work is way behind schedule. One cable ran on the road, about 5m from the end of the cul-de-sac. Just beyond the end of the road was a brick wall—the side of somebody's house—and the kids had been playing a game of Chicken, Eldorado-style. They had taken turns to drive at speed towards the wall, the winner being the one whose skid marks started closest to it. A group of spectators had gathered (probably including the luckless car owner), and in the mêlée the trunk cable had been severed, probably by the skidding car wheels. The group had then dispersed to their homes to watch TV, only to find that due to the laziness and incompetence of the Council the TV system was faulty.

This trunk carried line power, and when the cable had been broken it must have shorted momentarily because the line power supply unit at the other end of the estate had shut down. All the repeaters were off, so the whole place had no TV. I butt-jointed the cable and re-set the line power. Line power consumption was exactly as it should be, at 3.85A, so I sighed with relief and climbed wearily into the van. But before I could escape a tenant came out. 'It's gone off again!' was his happy news. In fact, only a small part of the estate, about thirty flats, was without reception. These were the ones served by the damaged cable. As I stood in one of the flats looking gloomily at the blank TV screen, the picture suddenly came on, went off, and came on again. The instantaneous change from absolutely no signal to a normal signal and then back again looked to me more like the result of line power interruption than simple signal interruption. In the latter case the signal level rarely goes down to absolutely nothing—most bad contacts and the like will pass a bit of signal, but no line power. If a cable had actually been severed, or an amplifier stolen off the wall, the picture would go off and stay off. I went out and climbed to the top of a nearby heap of rubble. From there I could see the damaged cable. A group of little kids was trying to use it as a skipping rope. No telly, you see, so they were making their own entertainment. The inner core must have been pulled and broken somewhere along its length, and the movement was presumably causing it to make and break contact. The repeater at the end of the cable was being switched on and off. At each side of the road the cable disappeared under heaps of soil. I would have to bypass it, somehow.

The builders had not yet got round to installing the new underground cable which would

eventually replace the faulty trunk, but two other cables, which together covered the distance, had been put in a few days before. As a temporary measure I would make use of them. When I went to the first point where the cables came up in the void (call it point A) I saw that I had a problem. The builders had been given a drawing showing all 55 cable routes. They had been told to label both ends of every cable with its number. This they had failed to do. Eight cables emerged from the ground. Each went to a different place, where lots of other cables also emerged. Only one of the cables was the correct one: which one was it? It had been my intention to trace and label all the cables the following week. This was to be done in a leisurely manner with a helper and a pair of two-way radios.

It was now 7.30pm. The potential leg-work involved in tracing each cable was considerable: some of these routes were 150m long. Using 75W resistors (intended for line terminations) I made up eight different series/parallel combinations, and connected one to each of the eight cables at point A. At point B the multimeter identified the correct cable. The procedure was repeated to establish a link between points B and C. Suddenly it all seemed possible. In a daze caused by low blood sugar and general exhaustion, I felt that the end was in sight. All I had to do was connect up at A, B, and C, set the signal levels at the repeater, and Bob would be my uncle!

By this time I was using the van to get from one place to another even when the distance involved was only 50m or so. I didn't feel up to walking. At the top end of the new link I entered the void to find it occupied by a group of lads and lasses smoking strange substances and snogging, in a half-hearted, lethargic manner. They know I'm the man who makes the telly work, so they don't usually give me much hassle, unlike some of their parents. It's warm in the voids because of the district heating system, and they were taking advantage of the fact that the door was off its hinges to turn the place into an impromptu youth club.. They didn't seem to mind the dark, the spiders, or the mud. We exchanged pleasantries as I connected the new cable into a Teleste (used to be Labgear) CM9025 splitter. The Teleste CM range of splitters and taps are intended for trunk cable applications. They are built into strong diecast housings with a good weatherproof seal. The terminals at top left and right are sized for 11mm or bigger cables, with a nice big screw for the inner conductor. The terminals along the bottom are sized for 6 or 7mm cable, fair enough when the unit is used as a tap-off

feeding downleads, but not so good when the output cables are 11mm. This is very likely in the case of the splitters and the lower value taps, which are often used as spur units to originate a sub-trunk. The screws for the coax inner on the output terminals are quite small, and the clip into which they locate is only fastened with solder onto the printed circuit board. The slightest pull and it's off. This one wasn't off, but it was loose, and I didn't trust it. Not wishing to spoil the convivial atmosphere of the void with oaths, I merely took a deep breath (which made me dizzy) and went to the van for a replacement. The first choice would have been one of the small splitters now available with 'f' sockets. The better makes are fully screened, have good matching and signal loss performance, and are cheap. But they don't pass line power, so it had to be another CM9025.

After this small delay I drove down to point B, where I linked the two cables. The void door had previously been forced and I had a job to shut it after me, so I had to bang it a few times. A boy of about 13, wearing a tee-shirt with the slogan 'Urban Terrorist' on it, came out of no. 6 Fidel Castro Close, the flat above. He swore at me fluently and comprehensively for making a noise. I told him to 'buggar off'. Then down to the bottom of the estate, where I connected the new cable into the repeater. Adjustment of signal levels was cursory, to say the least, but now everything should work. I could go home, to bed, perchance to sleep—or even to die, I didn't much care which.

I came out of the void door and looked up and down the street. A number of people were hanging about. 'It's back on,' I shouted in an unguarded moment. They scurried into their flats, then came out again. The consensus of those from the left-hand side of the street was that it was, indeed, on, but it was 'Effing crap'. Those from the right-hand side of the street were unanimous: 'It effing well ain't on!' they chorused. Now how could this be? Thirty seconds previously I had seen +45dB/mV at the repeater output—the analyser showed a nice clear picture of Sgt Cryer ticking off some miscreant—now all these people said it wasn't working. No, wait a minute, the side of the street nearest to the repeater had no effing reception; but the flats further away, fed by yet another lossy underground cable, had 'effing crap' reception. That didn't add up. I checked the repeater output again: it was OK. I ventured further into the void. Twenty paces into the dark brought me to the first tap-off unit. The cable which should have gone into it was on the floor. A large bracket had recently been fitted near the

unit to support some pipes. The pipe fitter had carefully unscrewed the terminals in the tap-off, pulled the cable out, re-routed it to avoid the bracket, then pushed it back in without bothering to tighten the terminals. It seemed likely that my coming and going, opening and closing the void door, had been enough to make this cable simply fall out of the tap. Putting it back would restore reception to all the flats in the row. Again I emerged from the void. The right-hand side of the street was deserted—a sure sign of my success in that area. The left-hand side was getting ugly. 'It's still the same' was the only printable comment. I crossed the street and entered the void which runs under the left-hand side of the street. A meter check at the emerging underground cable showed +33dB/mV—fair enough after a splitter and a length of cable twenty-five years in the ground. I checked the level at a line connector just inside the void, which meant that the continuation of the tap-off line had dropped to the floor. When I stooped to pick it up in order to reconnect it I got a wet hand. Soapy water dripped out of the connector. Further into the void I came upon a tap-off unit, the second one of the line. Above it was a 2' wastepipe, with water dripping from a joint. The tap-off had been fixed on the wall upside down, presumably so the cables would reach. The rubber seal on the bottom (or top, in this case), was missing, and the drips were landing neatly in the unit, which was full of bathwater. The leak must have started only a day or two previously, because there were no signs of long-term water damage, but in that short time the semi-airspaced cable had become saturated for a total length of 40m., taking in two more tap-off units—also mounted upside down.

Anyone familiar with domestic grades of coax will know that the semi-airspaced types fill with water very readily. Each of the five little cells in the polyethylene dielectric acts as a water pipe, running the length of the cable. The problem is worse with the larger diameter cables, and can cause serious problems. Last year I was called to a satellite IF system serving eight widely-spaced blocks of flats. All the underground links were in ducts shared with other services. A leaking water main had, unnoticed, almost filled one of the ducts. Unfortunately there were splitters down there, which of course were not waterproof. All the cables had to be changed, at a cost running into four figures.

I pondered briefly on the phenomenon of an Eldorado family who took frequent baths, but putting this thought aside I was gripped by a feeling of blind and grim determination. I would get this fixed if it took all night and all the next

day. In fact it took until ten past ten. I replaced three tap-off units and 40m of trunk cable. Since the downloads went upwards from the taps I was prepared to assume that they were dry. I finally crawled out into the night as Trevor MacDonald strutted his funky stuff. The street was deserted. In my delirious state I had an imaginary little conversation with myself: 'Thank you very much for working so late just to get all our TVs on, Mr Wright. Would you like a cup of tea and a Hobnob?' 'Thank you, that's very kind, but I'd better be getting home for my supper'.

At home I found that I could just about manage a bowl of cornflakes. I showered, and then slept soundly. Next morning the housing manager rung to complain that I had sworn at a young child on Fidel Castro Close.

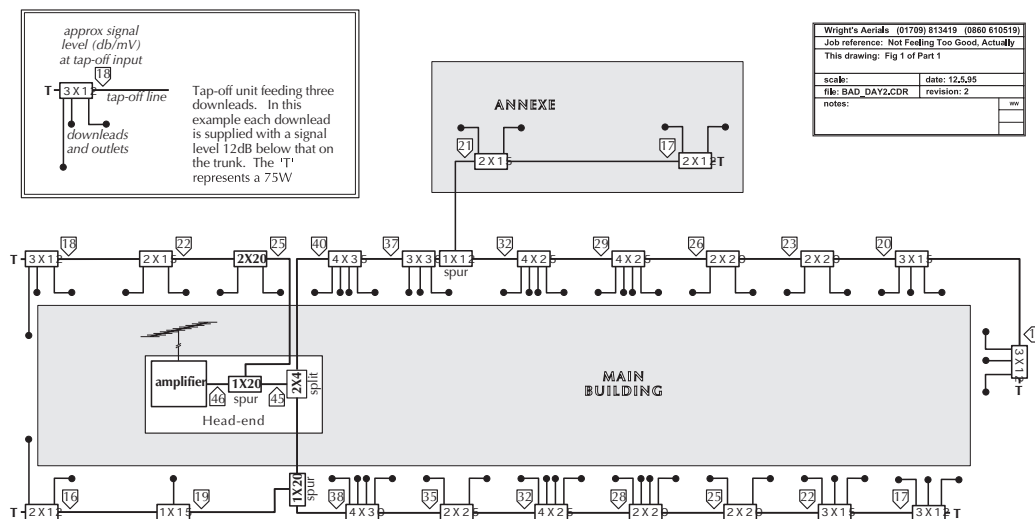


fig 1 (of Part 1)
 UHF distribution system at Saxon House
 This is a typical 'trunk and tap-off' UHF system design. This design can also be used for VHF, but is not suitable for carrying SAT-F without modification.
 The tap-off units are positioned so that as many downloads as possible (up to 4) can be fed from

each unit, consistent with the downloads being of reasonable length. The tap-off value of each tap-off unit is selected to provide its outlets with the correct signal level, taking into account the level on the line at that point. Downlead length may also be a factor. Because of cable loss on the tap-off line, and through-loss on each tap-off unit, tap-off values will gradually decrease along the length of the line.

Once the through-loss and cable loss figures are known it is simple to calculate the tap-off values. Calculations should be based on the figures for the highest channel in use.
 At the head-end an arrangement of splitters and/or tap-off units provides each tap-off line with the correct signal level.
 The tap-off value of the spur units (those tap-offs