

Restoration of a Skeleton National Telephone Company N° 16



The finished item.

After buying the UK version of this classic early 1900 LM Ericsson table phone, and realising that it was in a very poor state it has taken some years to get the time and motivation to tackle the job.

We saw in **Telephonetalk** Chapter 6 (Restoration), that a very, very conservative estimate of the restoration time would be about 4 days. In the case of this particular phone, double that time.

The main restoration issues were -

- **Silverfrosted Paint**
 - Hard to understand the motivation but, the phone had been painted with a thick coat of silverfrost paint finish, probably decades previously. They might have thought it improved the look?
 - Even the braided silk/cotton line and handset cords had a thick coat of Silverfrost paint
- **Minor Breaks to the deck**
 - This damage is quite common because of the brittle nature of the Ebonite material. This is possibly the most challenging part of the repair for the novice, but with patience and care, the result can be quite outstanding.
- **Broken timber turret**



- Quite a large piece broken from the side of the turret - a simple repair using "Plastibond" for strength.

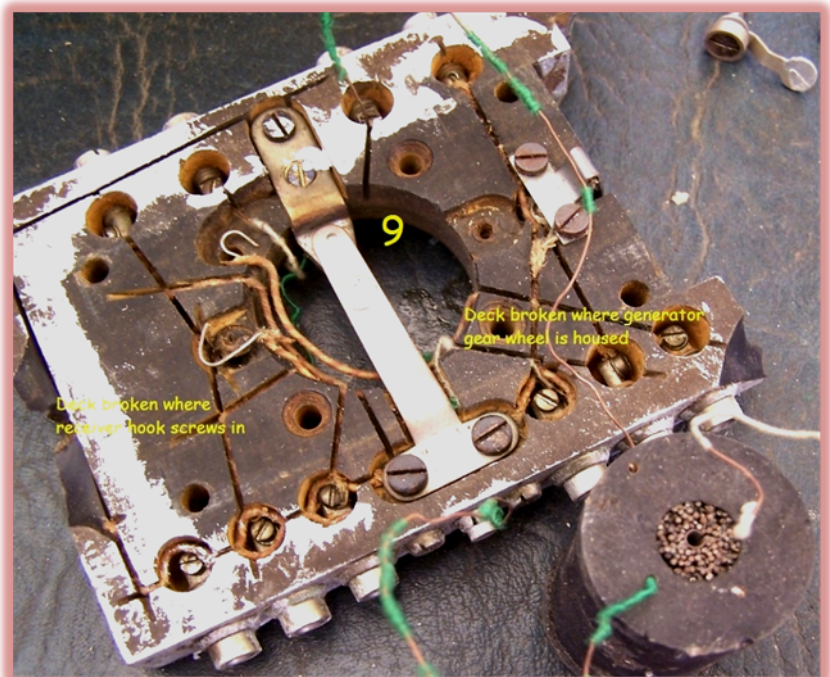
So, this is another case where we need weigh up the value of investing our valuable time for a complete restoration. Some uncommon features that were not often seen and important to keep as close as possible to original meant that this particular phone warranted the time for a careful restoration that retained as much originality as possible .

Some of these features are -

- **Original Silk and cotton cords**
 - 6 conductor (line) cord in exceptional condition (except for the Silverfrost paint)
 - Original Bakelite round line terminal block in good condition and complete with the lightning arrestor but with a generous coating of Silver paint.
 - 4 conductor handset cord in good condition
- **Unusual Receiver Hook**
 - The receiver hook, is smaller, but in the Ericsson style typical of the ones fitted to the front of the wooden wall phones (AB5xx and AB6xx series). The fact that this hook is simply screwed into the edge of the Ebonite deck would most certainly have been the cause of some deck damage.
- **Different timber turret**
 - To a casual viewer, the turret looks the same as any other, but it is marginally bigger in diameter at the base where it fits to the deck. The breakage originated at two of the screw holes where the turret is fixed to the deck. This could have been caused by lifting or carrying the phone by the turret or handset cradle - a definite "NO/NO".

Before we start the repairs, remember to take plenty of pictures to aid in the re-assembly process. This picture of the deck wiring (underside) is a very good example of the value of pictures. Without it, it can be very difficult to correctly restore the circuitry of the induction coil and other components.

Although it may be difficult to see "what goes where" in this picture, we will find that with it in conjunction with the parts laid out on the bench, it can be just as straightforward as completing a jig-saw



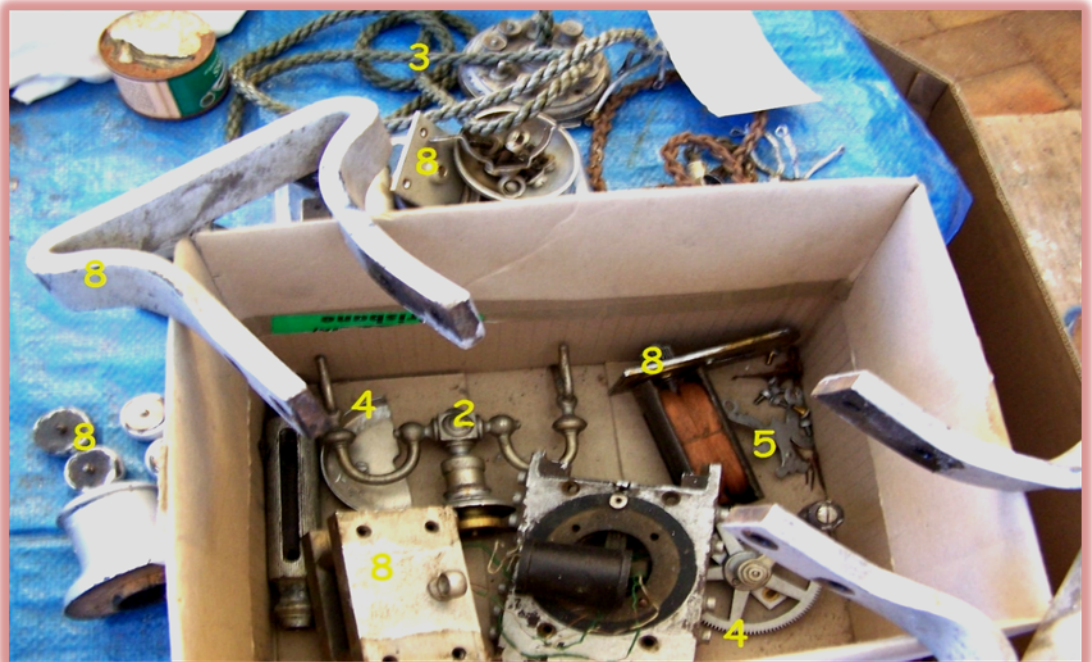
Disassembly is straightforward enough with

the main challenge being the removal of the brass sleeve atop the timber turret. There is a special tool for this but they are not generally available so the restorer might have to resort to using a pair of needle nosed pliers to loosen the threaded retaining ring inside the turret housing.

During the disassembly, the various parts will be assessed to determine what level of restoration is necessary ie corrosion, paintwork, Nickel plating, transfers etc.

Disassembly sequence is as follows - see the item numbers in the following picture

1. Make sure that you have a few small containers for separate parts.
2. Remove the handset cradle simply by loosening off the knurled retaining screw.
3. Remove the cords after writing down which colour conductor goes to each terminal.
4. Remove the main gear wheel cover, generator handle, main gear wheel and shaft.
5. Remove the ornate shaped spring connector from the opposite end of the deck to the generator handle. This connector is actually one of the points for the output current from the hand generator.
6. Remove the two (tiny) Nickel plated screws that retain the bell motor connector strips to the bell side of the ebonite deck.
7. At this point, the phone can be divided into two "halves" from deck up, and generator assembly down by removing the 4 screws holding the deck onto the generator block.
8. All of the parts from the lower half can then be easily separated. ie the legs, feet and spreaders, bell gongs/motor, generator end plates, generator armature, Nickel plated cord retaining rings/bull ring receiver retainer if fitted.
9. Take a picture of the underside of the deck and mark the induction coil connectors, so that they can be correctly refitted during reassembly - see preceding picture for No 9.
10. Then not so easily, the parts from the upper half can be separated. The two objectives are - a) To separate the timber turret from the deck, and b) To have the ebonite deck clear of all screws and connectors, to enable cleaning and repair. Only the connectors around the edges of the deck and the few parts necessary to remove the 3 (or 4) wood screws that hold the timber turret, from the underside of the deck.
11. To remove the connectors around the edge of the deck, first be sure to completely remove the tiny screw that holds the internal wiring in place. Then the main part of the connector can be unscrewed from the deck's edge - they can be a bit stubborn.



Restoration required -

1. Repairs to the Ebonite deck are challenging but often necessary. Obviously it is preferable if a phone with a perfect deck can be obtained, but unfortunately damage is common.
2. Paintwork. Black gloss for the legs screws and spreaders if fitted. Low sheen for the button feet, turret and bell motor parts.
3. Polishing the Nickel plating with 0000 steel wool and a cotton buffing wheel - see chapter 21 for more details.
4. Nickel plating only where absolutely necessary - bell gongs, cradle, screws, terminals etc. see Chapter 23.
5. Thorough but gentle cleaning of the parts that should be retained with a brass finish, namely, the top of the turret, the generator end plates, and the bell gong spacers.

In the case of this particular telephone, a large part of the preparation of the parts was to first remove the thick handpainted Silverfrost. Surprisingly this paint was best removed using Methylated Spirits - this picture shows the amount of paint that was removed after all of the methylated spirits evaporated off - approximately 2 tablespoons.

After soaking in methylated spirits for about 1-2 hours, the paint was able to be lightly scrubbed off into the methylated spirits container. Use either fine steel wool or small stiff brush. Most of plated metal parts can be scrubbed more aggressively and the plating might still be left in a good condition.

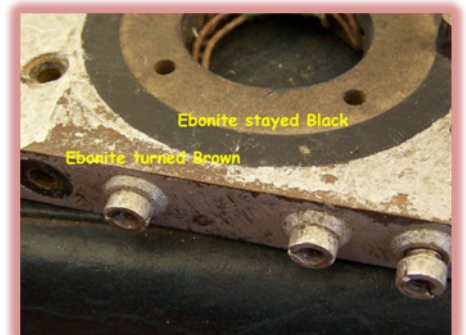
With this telephone, the cords also had a thick coating of Silverfrost paint that was able to be removed with methylated spirits - only gentle scrubbing though with a brush (toothbrush is ideal), otherwise the silk/cotton covering could be damaged.



Ebonite Deck Repair -

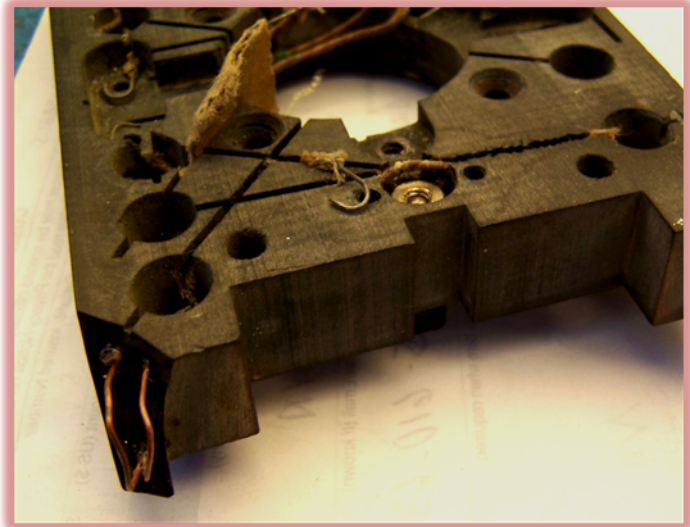
When the phone has been dismantled, the change of colour of the deck due to age and the environment can be clearly seen where the turret has covered and protected it from environmental conditions. There would be differing opinions regarding whether the deck colour should be returned to black, or to carefully retain the brown colour that it has turned to over almost 100 years of exposure to light and other conditions - the author believes that this is an important sign of age (patina) and should only be cleaned with the shine restored. For folk preferring black, the only realistic way is to apply gloss paint

To repair the breakages in the deck, reinforcing is mandatory - even with a "Plastibond" type of repair, it easily will break out unless reinforcing wire has been first. The deck should be buffed to a reasonable finish shine before the



breakages are repaired. Then drill small holes into the break(s) and glue in reinforcing wires using "5 minute" Araldite. To minimise any tidy up finishing work, use masking tape or in other ways, prevent excess Plastibond from flowing onto unwanted areas. In the case of this deck repair, a screw of the correct thread size with a liberal coating of petroleum jelly is inserted into the break, to create the required threaded hole. The petroleum jelly allows for an easy removal of the screw thread after the repair has hardened.

The following pictures show the deck in preparation for repair with with a precoloured "Plastibond" product



The right hand pictures also shows a small piece of cardboard wedged into a wiring slot to hold a loose wire in place. Before the hardener is added to the Plastibond it should be colour matched using tints as closely as possible to the aged colour of the deck.

A couple of coats of shellac will finish it off nicely when the repair to the deck is completed and and sanded to a smooth finish, and the colour match is satisfactory - this sentence doesn't take long to read, but there will be around a half day's work to actually achieve it.

Nickel plating - for more detail, see Chapter 21

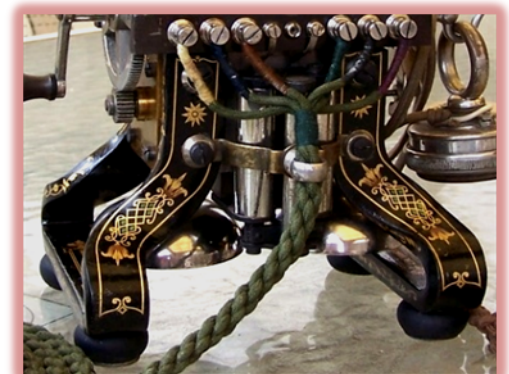
The existing finish should be cleaned and a brilliant shine achieved where possible. The initial cleaning is best using a fine grade steel wool. After cleaning, a cotton buffing wheel using "Green Chrome" or similar polishing compound will usually restore a brilliant shine. Alternatively, if a buffing wheel isn't available, polish with an auto cutting compound no 2.

If the Nickel plating is very poor, it may need to be replated as described in Chapter 23.

Painting -

This is very straightforward and has been explained previously but very briefly, common commercially available spray cans can be used. Only gloss black and low sheen or semi gloss are required.

The legs and spreader parts should be sprayed with gloss paint. Low sheen or semi gloss can be used for other parts such as the wooden turret and the bell motor parts.



Transfers -

Excellent quality reproduction transfers are available and can be carefully fitted to the repainted legs - note that most of the transfers are asymmetrical and there is a correct facing direction way for each one.

After applying the transfers and removing all bubbles, allow to dry thoroughly and then apply two protective coats of shellac.

Handset Restoration -

Handsets can be quite a challenge, particularly when the cord has to be removed and also when the transmitter has to be dismantled. Unfortunately if the handgrip is damaged and needs repair or replacement, then it will need to be dismantled. Unless repairs are needed to the transmitter though, it may be able to be left assembled and just removed with the module intact - this removes the need to dismantle the module and possibly lose some carbon granules, or more likely break the very fragile carbon diaphragm.

For this telephone, the handgrip had a minor breakage so it had to be dismantled.



Henry Ford would approve of this handset, the British (National Telephone Co) version with their typically drab finishes. Black plating of the metal parts such as the tubes housing the cord, and sometimes the receiver and transmitter modules. This one though has a less elegant alloy receiver and transmitter module. The rare tortoiseshell enhanced mouthpiece horn is not the original - these were only found on the Peel Connor

Handset Disassembly -

1. Firstly, remove the mouthpiece horn and store it somewhere safe because they are very fragile.
2. Disconnect the two receiver wires by removal of the fixing nuts.
3. The receiver module can then be removed by unscrewing the retaining nut
4. Similarly the transmitter module can be removed by unscrewing its' retaining nut. There will be a second nut inside that holds a wiring connection to the centre post on the transmitter.

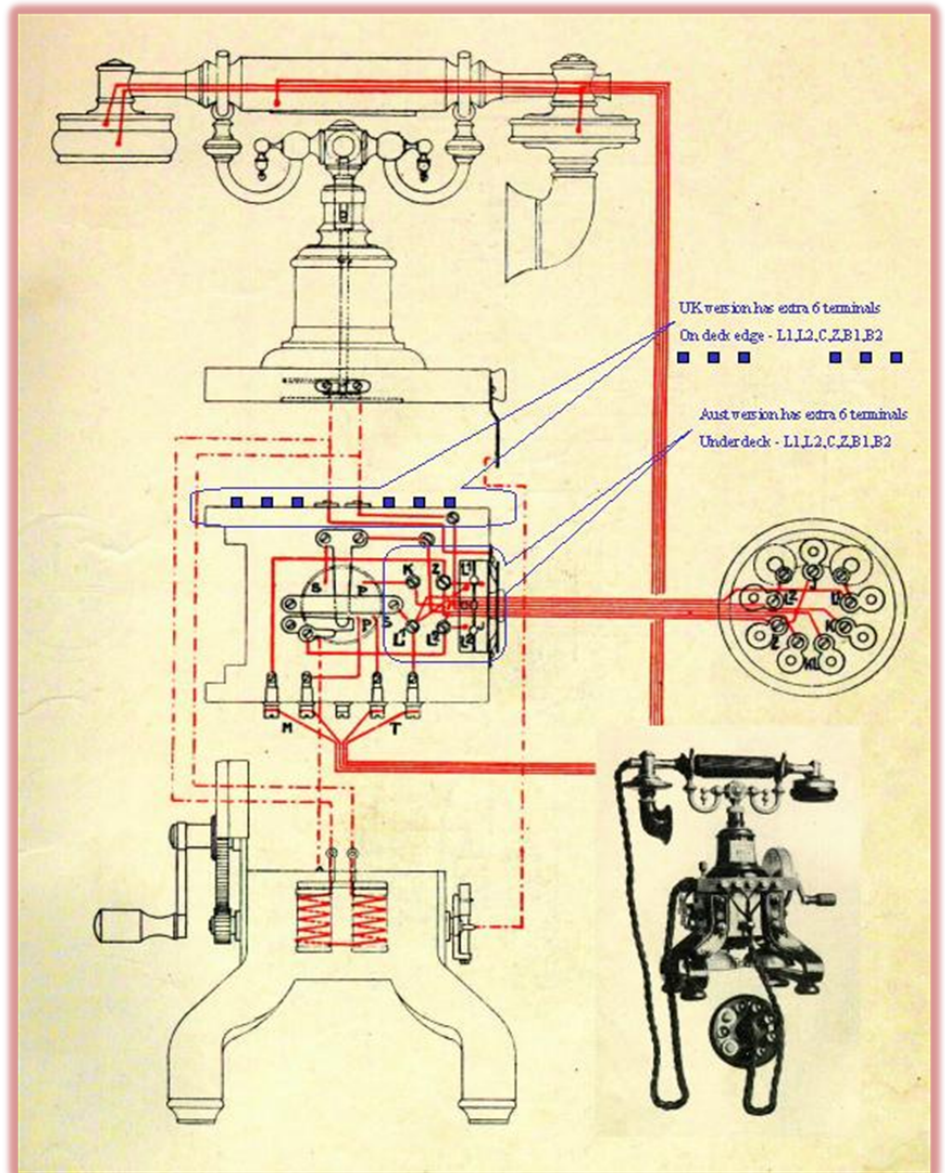
5. Remove the press switch from the handgrip. When the retaining screw is removed, another screw that holds a wire connection will be found underneath the switch lever.
6. The remaining screws can be removed from the handgrip and the components can then be separated for repairs.

Handset Repair -

Repairs are then carried out using the same principles outlined for similar materials ie Bakelite, Nickel plating, brass etc. Reproduction parts are available for those common breakages of transmitter horn and handgrip. Caution is needed when reinserting the transmitter and receiver end tubes into the handgrip. If it is a tight fit, carefully file out the inside of the handgrip with a "rat tail" (round) file. This will reduce the risk of the Bakelite handgrip breaking due to excess pressure, where it narrows at its' ends.

Still to do -

Add cradle teardrops
Spreaders for the legs



Circuit diagram

Check the links page of my web www.telephonetalk.com.au for parts/transfers