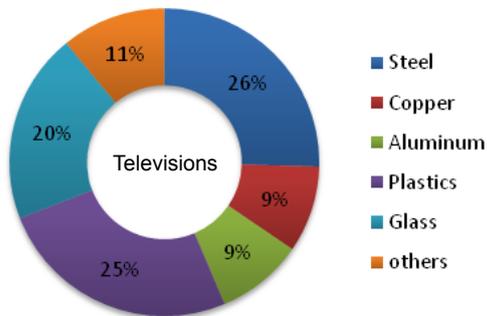
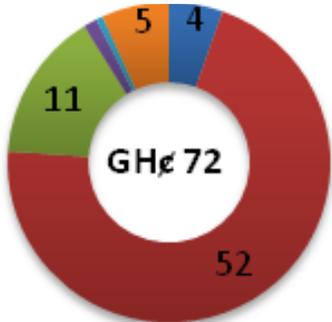


Material Composition



Scrap Value In Agbogbloshie



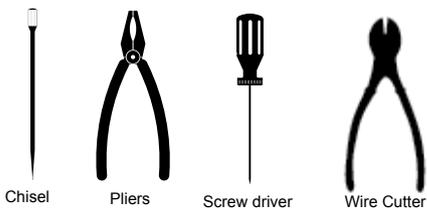
Urban Mining

The housing of the television is usually made of plastics. The cathode-ray tube is made up of glass, phosphorous and metal. The electron gun consist glass and nickel materials. Shadow mask are made of light steel and tin metals and the funnel glass is made of lead, Pb. Steering coils inside the television are made of copper winding coils that have the ability of creating magnetic fields inside the tube to accelerate and direct the electron beam. It also has some other parts made from plastic and metal. Gold (Au) is also used to plate the connecting wires and it helps improve electrical conductivity. All these as well as the components themselves have readily available market within the Agbogbloshie eco-system.



Tools For Disassembly

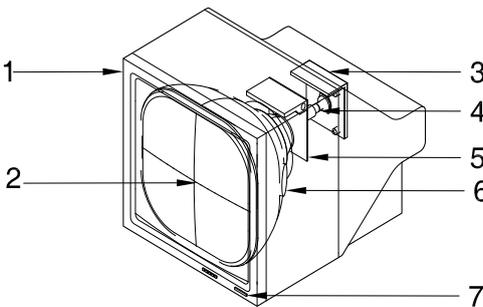
The tools required for processing: chisel, pliers, screwdriver, and wire cutters.



Tools are essential to the process of disassembly and are the primary means by which industrial activities are carried out. Tools have always represented societal advancement. The lack of proper tooling is a major hindrance to the industrialisation drive. In this case, knowledge of how to use them and make them represents a major cultural breakthrough.

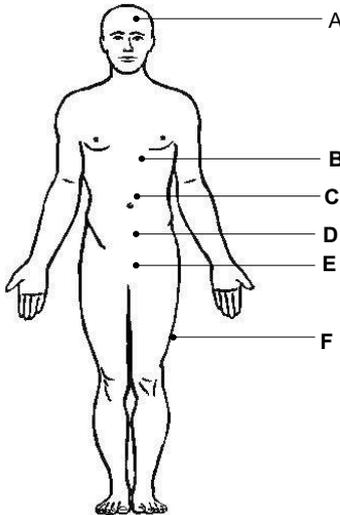
⚠ Tools are a potential source of injury. The risk can drastically be minimised by using the right tool for the right job. In addition, all requirements of the tool as provided in various manuals should be adhered to strictly

Television



1. Plastic Housing
2. Panel Glass
3. Electron Gun
4. Focusing Coil
5. Funnel Glass cone
6. Copper Yoke
7. Television switches

Health Hazards



- | | |
|-----------------------|------------------------|
| A. Nervous System | D. Urinary system |
| B. Respiratory system | E. Reproductive system |
| C. Immune system | F. Skin |

Step by Step Disassembly

- 1 Remove the plastic housing, the back cover by unscrewing all the screws.
- 2 Cut off all the cables to detach the various parts.
- 3 Discharge the television's capacitor and remove the circuit board
- 4 Disassemble the steering coils for scrap copper, separate the materials and sort them according. Dispose of the leaded glasses of the television tube.
- 5 After disassembly, components should be documented. See example of this done during AMPQAMP workshop.

Television Overview

Common Brands

LG, Mitsubishi, Panasonic, Phillips, Samsung, Sanyo, Sharp, Sony, Toshiba

Hazardous Material

Beryllium oxide (BeO), cadmium (Cd), hexavalent chromium (Cr VI), lead (Pb), phosphorous (P), sulphur (S)

Key components/parts

Circuit board and Steering coils

Primary Materials

Aluminium (Al), copper (Cu), gold (Au), iron (Fe), plastics

Types

Cathode-ray tubes (CRT), liquid crystal display (LCD) and Plasma televisions

Weight Composition

10% Al, 10% Cu, 20 ppm Au, 22% glass, 28% plastic, 18% steel [1]

⚠ Televisions contain such heavy metals as cadmium (Cd) and lead, (Pb) found in cathode ray tube (CRT) screen, power supply, and in circuit boards.

Health

Cadmium (Cd) - Lung, kidney, immune system damage, Diarrhoea, Infertility, DNA damage.

Antimony (Sb)- Lung diseases, Heart problems, Diarrhoea, Severe vomiting, Stomach ulcers.

Nickel (Ni) - Dizziness, Respiratory failure Dermatitis, Increased chances of cancer development, Birth defects, Asthma and chronic bronchitis, Heart disorders.

Safety Gear

The disassembly process exposes the worker to various levels of potential harm. There is a need for protective gear to reduce impact of these practises. Safety gear include gas masks to protect e-waste workers from dust and toxic gases and hazmat suits, which are full garments with footwear and masks, worn to protect e-waste workers from dangerous chemicals and the like.



Speaker



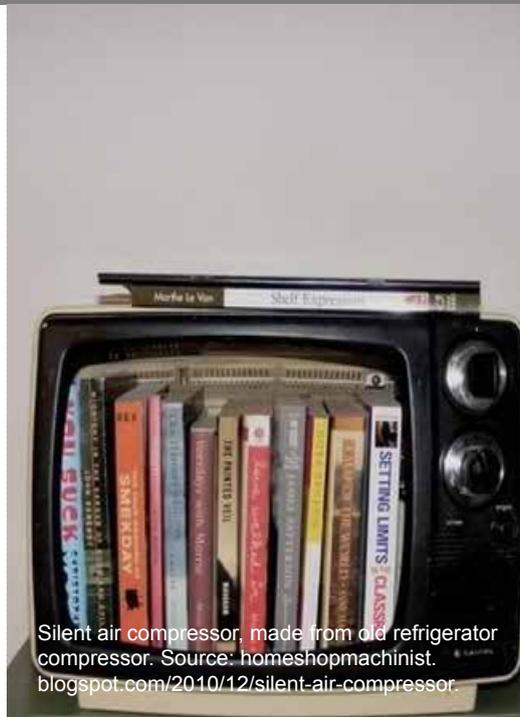
The CRT and Disassembled Parts



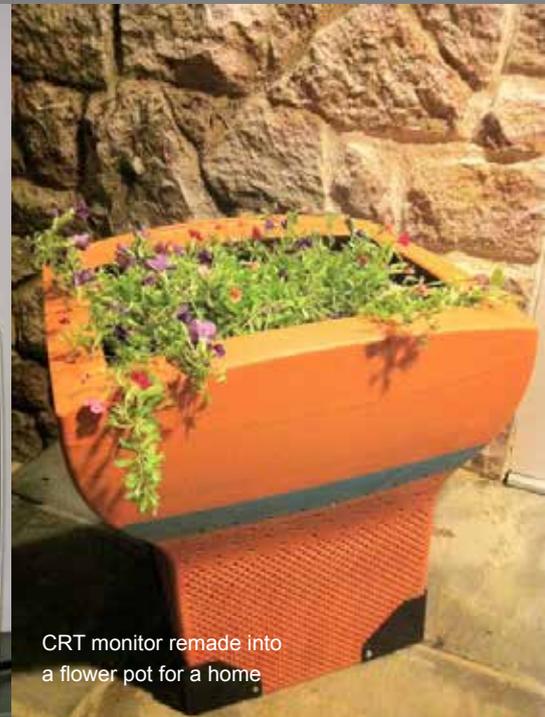
Circuit Board



Although CRT televisions are no longer used in more developed parts of the world, they still constitute a significant portion of the materials in transit through Agbogbloshie. In Agbogbloshie, these monitors are used mainly as seats, once their valuable metallic and other internal components are parts are extracted and sold. They have also been reused in some instances as receptacles for holding tools and other personal items, as well as dustbins. Old CRT monitors can be re-purposed for use in interior spaces as book holders(see image) and as planters outdoors.



Silent air compressor, made from old refrigerator compressor. Source: homeshopmachinist.blogspot.com/2010/12/silent-air-compressor.



CRT monitor remade into a flower pot for a home



Made in Agbogbloshie
Old cathode ray tube television shells(plastic) used for storage of printed circuit boards.

References/Notes

1 Hageluken, Improving metal returns and eco-efficiency in electronics recycling – A holistic approach for interface optimization between pre-processing and integrated metals smelting and refining, IEEE International Symposium on Electronics and the Environment, 2006, page 218–223
[2] ewasteguide.info

***Calculation on estimated value:**

Prices of materials vary in Agbogbloshie depending on the local market. Also the state of the materials also influences the price, that's the price of burnt copper differs from that of the unburned by 1 Ghana cedis per pound. In Agbogbloshie, copper and aluminium are weighed in pounds (lbs) and iron/steel is weighed in kilograms (kg). The prices we used in this calculation are that charged as at July, 2014.

Calculation inputs:

Total weight of equipment (W): 35 kg
Weight percent of material (W%): %
Weight of material (Wm): W% * W
Price per material = Wm * amount in GHC per kg
(1 kg = 2.204 pounds)

** These types of EEE are mostly found and dismantled in Agbogbloshie.



For more information, visit:
<http://qamp.net/CRT Televisions>

What is a CRT Television

A television is an electrical device with a screen that displays a received transmitted broadcast signal that has been converted into sounds and images. The transmitted signal can be received via antennae, satellite disc or wireless. There are different generations of the television set : cathode ray tube (CRT), liquid crystal display (LCD) and plasma. These have some common features and operate on slightly different principles.

How it works

The cathode ray tube has three main parts: Electron gun, deflection system and fluorescent screen. It consists of a cathode which is the heated filament found in a vacuum inside a glass tube which enables the flow of electrons generated. The anode focuses the stream of electrons into a beam and accelerates them. It then sends the accelerated electrons through the vacuum to hit the screen of the television. Phosphor is used to coat the screen which glows when the electron beam strikes the screen.



CRT Televisions

