Requirements and Precautions of EgyptSat-1
Onboard RF Unit Circuits Manufacturing,
Hands on Experience

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Introduction:

- EgyptSat-1 project concerns acquiring and transferring the space technology in different technical fields.
- Transferring the RF space technology to Egyptian industries considers the core of achieving capacity building, which also requires building of essential labs and completion of remaining facilities e.g. clean room, manufacturing and testing equipments, … etc.
- These facilities will positively affect the scientific and technical community in Egypt, improving the research field in different research centers and academic universities.
Introduction:

Space environment necessitates special treatment in manufacturing of the onboard equipments, especially the radio frequency unit circuits.
EgyptSat-1 Communication Subsystems:

- S-band subsystem.
- X-band.
- Store and Forward payload.
- GPS receiver.
RF Circuit Manufacturing:
Substrates:

- Alumina Substrate
- RT/Duroid 5880
Conductive Layers Depositing:
Ultrasonic Cleansing:

- Acetone
- Part to be cleaned
- deionized water
- Beaker
- Ultrasonic cleaner

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Photolithography Operation:
RF Unit Assembly:

Circuit fastened on the metal base (a) copper net soldered in between, (b) side view of the copper net
RF Unit Assembly:
RF Unit Assembly:

Top view of the X-band Transmitter Unit
Conclusion:

- Brief description of RF unit circuits manufacturing process is demonstrated.

- Special treatments for manufacturing of the communication RF unit circuits are required in order to operate perfectly and achieve the required tasks under the influence of space environment.
Thank you