Armstrong Lab In The Empire State Building Demonstrating FM Radio.

1950 RCA Antenna Experimental for 288 MHZ TV Transmission.
Empire State Building Broadcasting

**Broadcasting History**

- Built in 13 Months 1930-1931
- Broadcasting Began December 1930 before Building Officially Opened
- Broadcasting Tower Built 1950
- First Master FM Combiner Built in 1965 for 16 Stations
- 1st Empire State Building Broadcaster remains 83 Years Later
Empire State Building Broadcasting

- Centrally Located in Mid-Town Manhattan
- 1,454 Height Above Grade
- Base of Building 50 Feet Above Mean Sea Level
- 400 Feet of Antenna Aperture Space
- Many Lower Setbacks
- Highest Level of Security - Access
- Modernized Elevators
DIGITAL TV STATION COVERAGE AREA

Base Building Height
Above Mean Sea Level 50 Feet

Latitude 40° 44' 54"
Longitude -73° 59' 10"

FCC Tower Registration # 1007048
CENTRALLY LOCATED IN MID-TOWN MANHATTAN

1,454 HEIGHT ABOVE GRADE
BASE OF BUILDING 50 FEET ABOVE MEAN SEA LEVEL
400 FEET OF ANTENNA APERTURE SPACE

MANY LOWER SETBACKS

HIGHEST LEVEL OF SECURITY - ACCESS
RENOVATED ELEVATORS

BROADCAST TOWER

- 19 FM Radio Stations
- 15 TV Stations
- 8 UHF, 3 VHF, 4 LPTV
- Removal of Unused Infrastructure
- Installation of LED Lighting
- RF Monitoring System
- Barcoding of Antennae & TX Lines
Empire State Building Broadcasting

TOWER ABOVE 1250 FEET

▲ Infrastructure Removed
▲ Tower Prepared for New Antennas
▲ Tower Fully Code Compliant
▲ Upgraded FAA Warning Lights (LED)
▲ Electrical System Replaced
▲ Climbing Access Upgraded & Repaired
▲ Mooring Mast Waterproofed
▲ New Access Hatches Installed
Antenna Master

**Master FM**
ERI 1084 (4 sided)
Feed Line (2) 6 1/8” rigid

**Mini-Master**
(4 sided)
Feed Line 6 1/8” rigid
1 5/8” heliax
ANTENNA MAST TOP

Dielectric TF-3MT Batwing VHF

WNBC/WNYW Channel 4/5
(NBC/FOX)

Feed Line (2) 3 1/8” Rigid
UNIVISION TV ANTENNAS

ERI Trasar
Channel 40 / 41
DTV ANTENNA
MINI-MASTER AUX

CBS DTV (Dielectric)
WCBS, WWOR, WNBC,
(NW LEG) Line Feed (2) 6 1/8” Rigid

MINI MASTER (ERI)
AUXILIARY FM
(4 Sided) Line Feed (2) 3 1/8” Rigid

Hi-BAND VHF (Dielectric)
WABC, WPIX, WNET (4 Sided)
BASE OF TOWER

- Vacated to Accommodate New Master FM
- FM Auxiliary Antenna
- New Climbing Aperture
- New RF Shield Isolates Main Antenna from Auxiliary Antenna
BROADCAST INFRASTRUCTURE INVENTORY BAR CODING

- Database of All Antennae & Transmission Lines
- Labelling with Bar Code Tags
- Ease of Identification with Handheld Bar Code Reader
- Facilitates Maintenance Upgrades & Repairs
- Ease of Management of Shaft Ways & Antenna Space
TELECOMMUNICATIONS

▲ Upper Setbacks for STL & Point to Point Communications

▲ Redundancy for Fiber Optic Communications Services

▲ Unobstructed Line of Sight to Surrounding Area

▲ Ease of Installations from many Setbacks
TOWER RECONFIGURATION

- New Combined Antenna for 8 UHF Stations
- New Circularly Polarized VHF Antenna
- New 19 Station Master FM Combiner & Antenna
- New 19 Station Master FM Auxiliary Antenna
- New RF Shield to Separate Tower - Main / Aux
- Shielded Climbing Aperture
- Continued Broadcasting from ESB during Construction
BEST PRACTICE

- Broadcast Operations Procedures Protocol
- Building Wide RF Monitoring System
  - RF Controlled Area Access
  - RF Safety Procedures & Training
- Detailed Annual Inspection Reporting
- Building Maintenance & Upgrades
- Security Access Control
Thank You!