



Job Analysis for Electronic Systems Technicians

Project Startup

1. *Review project scope by reading the project documentation in order to become familiar with the specific job requirements.*

Knowledge of:

- ✦ Plans and schematics
- ✦ Schedules
- ✦ Addenda
- ✦ Project specifications
- ✦ Bill of materials
- ✦ Procedures for changes and substitutions (RFIs, CCDs)

Skill in:

- ✦ Identifying project contacts
- Reading blueprints and technical drawings

2. *Compare project documentation for accuracy and compliance with site conditions in order to meet the expectations of the project.*

Knowledge of:

- ✦ Site conditions
- ✦ Compliance codes
- ✦ Construction practices and procedures
- ✦ Construction schedules
- ✦ Needs of the customer

Skill in:

- ✦ Interpreting the scope of work documents and specifications and
- ✦ Validating against architectural conditions
- ✦ Verifying the bill of materials necessary for job completion
- ✦ Reviewing approved submittals
- ✦ Reading takeoffs (symbols, notes, etc.)
- ✦ Communicating effectively with project team members

3. *Identify applicable safety requirements using appropriate reference materials in order to prepare for specific site conditions.*

Knowledge of:

- ✦ OSHA 10
- ✦ Company-specific injury prevention programs
- ✦ Site-specific safety conditions (barriers, fall hazards, etc.)
- ✦ Lockout tagout procedures
- ✦ Material safety data sheet (MSDS)

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Skill in:

- ✦ Ensuring workforce protection
- ✦ Using personal protective equipment (eye protection, hearing, vests, hard hat, etc.)
- ✦ Using tools and equipment safely
- ✦ Updating safety logs

Rough-in Installation

1. *Determine the rough-in requirements using recognized industry methods in order to enable the installation of specified components.*

Knowledge of:

- ✦ Scope of work
- ✦ Methods (cable pulling techniques, tensions, bend radius, lubricants, etc.)
- ✦ General construction techniques (e.g, Header, Joists, Beams, Columns)
- ✦ Fasteners and anchors
- ✦ Pathways and Spaces
- ✦ Blueprints and technical drawings
- ✦ Codes & Standards
- ✦ Power and hand tools

Skill in:

- ✦ Identify devices and select the correct cables for the cable run
- ✦ Determine the starting and end locations of each cable run
- ✦ Determine the rough in box requirements
- ✦ Verify the dimensional requirements for each device to be installed
- ✦ Select the best pathway or spaces for the cable run to minimize damage and maximize installation efficiency.
- ✦ Determine the method that will be used to support the cable (e.g, Conduit, Cable Tray, J – Hooks, Surface Mount)
- ✦ Verify that all runs will be done to Codes & Standards (separations, types, neatness, etc.)
- ✦ Adapting to on site conditions
- ✦ Identifying appropriate personnel to resolve site condition questions

2. *Implement the tasks of cable and component rough-in using approved installation techniques which ensure system functionality.*

Knowledge of:

- ✦ Basic Communication Skills
- ✦ Methods and material for securing devices and cables
- ✦ Tools & equipment for pulling cables and mounting rough-in (e.g., mechanical tuggers, winches, fish tapes)
- ✦ Manufacturer's specifications, codes & standards

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Skill in:

- ✦ Selecting the proper Fasteners and Anchors for all hardware devices
- ✦ Hanging rough-in boxes for devices
- ✦ Installing Cabling Method for cable pull
- ✦ Setting up to pull the cable
- ✦ Labeling Cables and other rough-in devices
- ✦ Following proper manufacture specifications
- ✦ Following proper Codes & Standards

3. *Verify the implementation of the rough-in tasks by documenting and labeling all cabling and components as specified in project documentation in order to complete the rough-in process.*

Knowledge of:

- ✦ Technical Drawings
- ✦ Basic hand tools
- ✦ Test equipment
- ✦ Blueprints
- ✦ Codes & Standards

Skill in:

- ✦ Labeling Cable and devices properly
- ✦ Verifying that all rough-in boxes are installed to project scope
- ✦ Verifying that all the cables are run to the project scope
- ✦ Verifying cable integrity after the Cable run both electrically and mechanically
- ✦ Verifying that all Cable was run to code and standards
- ✦ Updating as-built drawings
- ✦ Cleaning up work area

Termination and component installation

1. *Verify proper communication protocol infrastructure will be utilized during installation to meet equipment interface requirements.*

Knowledge of:

- ✦ Basic communication protocol theory
- ✦ Structured cabling architecture (EIA/TIA)
- ✦ Serial communications (RS232, RS422, RS485, etc.)
- ✦ TCP/IP
- ✦ Various signal types and signal flow



2. *Install system components using proper tools and connectors to meet approved industry standards.*

Knowledge of:

- ✦ Connectors (e.g. the right connector and tool)
- ✦ Cable types per National Electric Code
- ✦ Enclosures
- ✦ Associated codes and documentation (eg...rack clearances etc...)
- ✦ Proper mounting techniques (fasteners, anchors, and tools; type of mounting material)

Skilled in:

- ✦ Dressing cables per industry standards
- ✦ Terminating conductors per manufacture's specifications and standards (soldering, punch-downs, etc)
- ✦ Installing devices and hardware
- ✦ Using proper tools and techniques

3. *Confirm proper installation of system components using appropriate test equipment in order to verify the integrity of the system.*

Knowledge of:

- ✦ Electronic theory
- ✦ Electrical theory
- ✦ Test equipment and procedures
- ✦ Testing reports
- ✦ Proper system performance
- ✦ Industry standards
- ✦ Various signal types and signal flow

Skilled in:

- ✦ Reading meters
- ✦ Using test equipment to check terminations
- ✦ Identifying points of failure (e.g., ground faults, opens, shorts, and other anomalies)
- ✦ Verifying the installation as per scope of work

4. *Update documentation for future reference using appropriate record keeping practices.*

Knowledge of:

- ✦ Proper labeling techniques (hardware, devices, cabling)
 - ✦ Effective written communication techniques
- Procedures for changes and substitutions (RFIs, CCDs)

Skilled in:

- ✦ Submitting standard information and communication forms
- ✦ Recording all test results and data
- ✦ Recording all equipment data.(eg., addresses, serial numbers, locations, special notes etc...)

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System activation and project closeout

1. *Confirm that the system was installed according to the requirements of the scope of work and related project documentation.*

Knowledge of:

- ✦ System startup and activation procedures
- ✦ equipment and interfaces
- ✦ Testing and calibration
- ✦ Plans and schematics
- ✦ Electronics – electrical systems AC/DC circuits grounding
- ✦ Software installation procedures and Control protocols (RS232, etc..)
- ✦ Appropriate test and measurement equipment
- ✦ Codes and safety regulations

Skill in:

- ✦ Creating and using a punchlist (error and correction report)
- ✦ Evaluating test results against performance expectations
- ✦ Verifying complete functionality and operation
- ✦ Verifying the proper operating levels, phasing and, grounding has been provided (e.g., voltage, gain structure, current)
- ✦ Using multi-meters and associated test equipment

2. *Conduct troubleshooting procedures as necessary using appropriate test methodologies to complete system startup and activation.*

Knowledge of:

- ✦ Troubleshooting techniques
- ✦ Intended system operation
- ✦ Likely causes of failures
- ✦ Test and measurement equipment and procedures
- ✦ Electronics – electrical systems AC/DC circuits grounding
- ✦ Software and control protocols – RS232 etc..

Skilled in:

- ✦ Using test equipment to determine causes of failure (meters, Scanners, etc)
- ✦ Creating, prioritizing, and implementing a failure correction plan
- ✦ Locating appropriate diagnostic resources (ie manufacturer support, in-house support, manual, etc)
- ✦ Implementing system startup and activation procedures

3. *Complete necessary closeout documentation for delivery to appropriate person to initiate project completion procedures.*



Knowledge of:

- ✦ Documentation and Drawings (As-built, BOM, Schematics)
- Closeout procedures and practices

Skilled in:

- ✦ Checking and validating as-built drawings
 - ✦ Modifying appropriate project documentation including BOM, schematics,
 - ✦ Initiating appropriate procedures for compliance “permits, inspection certificates, etc.
 - ✦ Initiating appropriate procedures for training
- Communicating effectively (Written, Verbal, etc)

EST-L2 exam preparation resources:

- ✦ Create your own review materials
- ✦ Enroll in the NSCA EST-L2 on-line review course
- ✦ Find resources on the internet (study materials, workshops, study groups, etc.)

See NSCA’s approved list of reference materials:

Title	Author	Publisher	Year
A Guide to the Project Management Body of Knowledge 3rd Edition	Project Management Institute	Project Management Institute	2004
Advanced Electrical Topics 20512	Wheels of Learning	Prentice Hall	2002
Audio Systems Technology Level 1	Garter, Larry	Prompt	1998
Construction Project Administration	Fisk, Edward	Wiley	1982
http://www.osha.gov	Website	N/A	2008
NCCER Level 1	NCCER	NCCER	2004
NCCER Level 2	NCCER	NCCER	2004
NCCER Level 3	NCCER	NCCER	2004
NFPA 70 National Electrical Code	NFPA	NFPA	2008
NFPA 72 National Fire Alarm Code	NFPA	NFPA	2007
NTC Blue Book	National Training Center	National Training Center	2005
Sound System Engineering	Davis, Don	Focal Press	2006
Telecommunications Cabling Installation	BICSI Steering Committee 200	McGraw-Hill	2001
Yamaha Sound Reinforcement Handbook	Davis, Gary and Jones, Ralph	Hal Leonard	1989