ETA MASTER RESI COMPETENCIES

RESIDENTIAL ELECTRONICS SYSTEMS INTEGRATOR – RESI
There are **two** levels of expertise for those who install electronics systems in residences and interconnect electronics communications, computer, control or entertainment equipment; the **Basic RESI,** Residential Electronics Systems Integrator and **Master RESI,** Residential Electronics Systems Integrator:

The **BASIC RESI** is proficient in the design of pre-wiring for home theater and telecommunications equipment interconnection. He/she will install network wiring for cable TV, satellite and antenna outlets, telephone equipment outlets, audio and video entertainment, and computer equipment in such a manner that all control and communication signals can be integrated at the home controller and converged into one cogent IP bit stream, to either be used within the residence or to be passed back and forth through the home gateway. He/she will be proficient in the many protocols used over diverse media to communicate with and control residential electronics systems, in addition to the skills required for low voltage wiring installation. He/she will work from house telecommunications wiring plans, installing cable fittings and selecting the specified cabling for each technology. He/she will test, mark and document all cabling and will have the ability to troubleshoot and restore pre-existing cabling systems. RESI Integrators typically will also be qualified in one or more of the five (5) endorsement specialty areas listed below.

The **MASTER RESI** will be proficient in all of the core RESI skills and knowledge and in planning and designing electronics and communications equipment systems and layout for new and existing construction. The MASTER RESI is capable of designing the entire system and network for audio, video, data and control of security and environment to function in one IP bit stream converged at the home controller. He/she is also capable of troubleshooting and debugging the system and planning installation or modifications. The MASTER RESI has extensive knowledge of the operation and technology and is proficient in each of the basic five subcategories of residential electronics.

RESI CERTIFICATION PROGRAMS:

The **RESI** can become certified with ETA® International by passing the knowledge examination assessments, **RESI BASIC Skills & Knowledge**.

In addition, **RESI** certificants can also acquire one or more of the five (5) subcategories endorsement certifications, as listed below:

- **RESI (Basic Core Integrator)**
- **RESI Endorsements:**

    1. **Audio/Video**
    2. **Computer Networking**
    3. **Security-Surveillance**
    4. **CCTV (Closed-Circuit TV)**
    5. **Environmental Control**

- **MASTER RESI Integrator**

The **MASTER RESI** certification prerequisites include successfully completing the core RESI certification requirements, plus holding **each** of the five (5) RESI subcategory endorsements.

To qualify for the ETA **MASTER RESI**, Residential Electronics Systems Integrator, a technician must:

- Hold the RESI Basic certification
- Pass each of the five (5) specialty endorsements
- Pass a separate Master RESI examination

ETA MASTER RESI COMPETENCIES

1.0 Terminology

1.1 Define the following terms used in RESI technology:

- 1.1.1 TCP/IP
- 1.1.2 DOCSIS
- 1.1.3 B Channel
- 1.1.4 TosLink
- 1.1.5 Line Seizure
- 1.1.6 Component Video
- 1.1.7 NAT
- 1.1.8 CSS
- 1.1.9 10Base-T
- 1.1.10 PLC
- 1.1.11 HD-DVD
- 1.1.12 Blu-ray
- 1.1.13 S/PDIF
- 1.1.14 Optical Fiber

2.0 Site Survey

2.1 Timing

- 2.1.1 Explain the purpose and procedure for organizing the plan of action for a new or retrofit installation of residential electronics technology utilizing a site survey, prior to drawing up the wiring and product installation documents.

2.2 Photography

- 2.2.1 Explain the purpose and extent of photography used in planning the wiring and product locations as confirmed with the customer or building contractor prior to initial installation of the systems.

2.3 Customer preferences

- 2.3.1 Explain the purpose and extent of written confirmed customer preferences prior to initiation of the systems installation.

2.4 Agreements

- 2.4.1 Contractor - Describe the ingredients of the Contractor Agreement, why it should be written and signed and dated.
- 2.4.2 Homeowner - Explain why a homeowner agreement is required prior to initiation of work on the installation site, what is included in the agreement and why it should be signed.

3.0 Job Plan – Coordinate with Other Trades

3.1 Describe the steps that should be included in the preliminary planning for a system contract.

3.2 Explain the timing, ingredients and purposes of a pre-planning conference with the contractor/builder and subcontractors.

3.3 Explain the purposes and responsibilities of those assigned and in charge of product procurements.

3.4 Explain what the installer resource verification process is and why it is required.

4.0 System Requirements & Documentation

4.1 Define and explain the purposes and role each of the following technologies plays in the system

- 4.1.1 B-VoIP
- 4.1.2 VoIP
- 4.1.3 DSL
- 4.1.4 BPL
- 4.1.5 BPL service:
- 4.1.6 Satellite
- 4.1.7 Bluetooth

4.1.8 WiFi technology:
4.1.9 Explain how the RJ31X product operates

5.0 Instructions to Systems Installers

5.1 List the major topics that must be included in employee instruction policy statements, including required licenses and certifications; job outlines; proper dress and customer relations rules
5.2 Explain rules for contract installers that can assure responsibility; outline discipline or fine policies for deficient work performance or damages; workman's compensation status affirmation; on-site hours; work review/tests and deadlines for work completion
5.3 List written policies for allied contractor workers that aim at coordinating with residential electronics installers; the proof that each worker is covered by his employer's workman's compensation insurance; that they are being compensated as employees or show they are abiding by the 'contract-labor' rules of the US Dept of Labor and IRS.
5.4 Explain why some residential electronics installers may not be sufficiently trained or skilled to perform each specialty of the project: (Audio/Video; Computer Networking; Security-Surveillance; CCTV; and Environmental Control)
5.5 Describe likely reasons for the incompletion of system installation on time, including homeowner unavailability; lack of documention; equipment delivery delays, or workers and subcontractors not showing up on schedule

6.0 Building Codes

6.1 Define "NEC"
6.2 Explain the purpose of NFPA standards
6.3 Define "OSHA" and explain the rules pertinent to residential electronics installer safety rules
6.4 Define "NAHB" and explain its purpose and why installers need to be aware of NAHB rules
6.5 Explain the purposes of the EIA/TIA-570 standard and list installation procedures that it addresses

6.6 Define the areas that the 802.11b IEEE standard addresses
6.7 Explain the RS 485-82C standard and name the organization(s) that own it

7.0 Standards

7.1 Name the organization that publishes Construction Rules – Lo/Hi Voltage Rules for residential housing and explain the purpose of those rules
7.2 Explain the components of the EIA/TIA installation rules as they apply to residential and commercial electronics products
7.3 List types of Local Codes and ordinances that installer companies may encounter in the residential electronics installation business.

8.0 Pre-assembly – Equipment Operation

8.1 Explain which entity is responsible for cabling and associated products verification as regards safety, appropriateness and compliance with standards, in residential installations
8.2 Describe the performance testing of audio products after installation has been completed in new and retrofit contracts
8.3 Describe video product operation checks and list tasks likely to be included
8.4 Explain the tasks necessary to assure the security product operation check addresses each aspect of the system
8.5 Explain the control product operation check components and explain how the homeowner, builder and subcontractors are involved in the final system approval
8.6 Compare the installation tools/equipment habits of an efficient cabling installer and that of a worker who may be unconcerned about efficiency and proper job equipment

8.7 Explain where the responsibility for proper total systems operation and proof of concept lies

9.0 Comments Procurement

9.1 Explain the concept and formality of disclaimers in cases where the builder or homeowner insists on utilizing existing wiring, for electrical equipment, data, phone, video and/or audio wiring

9.2 Describe written agreements required in cases where customer-owned equipment compatibility may be a question

10.0 Tools Inventory

10.1 List shop tools that residential electronics installation companies normally may utilize for specialized and related tasks

10.2 List on-site common and specialized tools used in RESI work

10.3 List service vehicle tools and supplies commonly used to supplement on-site equipment

10.4 Explain how subcontractor tools/supplies/test equipment inadequacies are of concern to the project manager

11.0 Work Areas Availability Check – Time sheets – Premises Restoration

11.1 Describe how the project manager must control worker and sub-contractor on-site work times and time sheets in order to expedite the installation and control of worker and subcontractor compensation

11.2 Describe keys access factors as relates to worker access to the job site

11.3 Explain why and when worker permissions may be needed and what security issues are involved

11.4 Describer the potential problems with allied worker access, entry, permissions and coordination between builder/subcontractors/home-owner can avert problems

12.0 Rough-in Component Location

12.1 Describe the need for floor plan prints prior to system design and during installation

12.2 Explain Homeowner/Contractor/Subcontractor component location agreements, markings and approval

12.3 Explain the need for the Backboard – Cabling distribution center location to be approved by the homeowner, builder and subcontractors

12.4 Explain retrofit component location marking and agreement

12.5 Explain the purpose in consulting the TIA/EIA 568A standard prior to installation of cabling

13.0 Installer Control Software – Computer Network

13.1 Explain the purpose and ingredients of an agreement with the homeowner regarding equipment compatibility between new products and pre-existing home-owner components

13.2 Describe the potential problems and costs associated with new computer – control equipment software incompatibility, programming requirements or accessories

14.0 Labels – Marking Verification

14.1 Describe a common labeling scheme plan for identifying cables and connections

14.2 Describe common types of labeling supplies/equipment

15.0 Troubleshooting - Problem Detection & Remedies

15.1 Explain the steps in subsystems operation verification and which personnel are required

15.2 Describe total system compatibility verification and when and how it is demonstrated to the builder and homeowner.

15.3 Explain 'Jiggle tests', and how and when they are to be performed
15.4 Explain cable fault-finding equipment and acceptance principles
15.5 Explain methods of verifying causes of malfunctions that occur during installation and acceptance, as well as afterwards

16.0 Equipment Documentation & Instructions to Customer

16.1 Explain where and why sales receipts are maintained and made available for presentations and verification
16.2 Explain the importance of warranty cards and submissions to the product makers
16.3 Describe the purpose and time for homeowner orientation and instructions for usage of the system
16.4 Explain why the homeowner should be drilled on the practice and operation of the system
16.5 Explain why archiving of installation/products/operations events records, agreements, plans, etc. are required

17.0 Demonstrate System Operation & Components – Test Equipment – Convergence Software

17.1 Describe final operations checklist
17.2 Describe final system testing prior to demonstration
17.3 Explain software compatibility verification tests

18.0 Complete Warranty Forms

18.1 Explain homeowner lists for product warranty expirations and instruction to the homeowner about their value
18.2 Explain homeowner lists for installation warranties on installation labor costs, maintenance and service

19.0 Preventive Maintenance Program

19.1 Describe false alarm avoidance concepts
19.2 Explain how a maintenance recommendation list can be used by the home-owner or builder
19.3 Describe firewalls and their purposes and precautions for installers

20.0 Liability – Legal Issues

20.1 Describe how inadequate security/surveillance products or installation can become a legal problem and defeat the purpose of the installation
20.2 Explain legal aspects of CCTV – Covert Cameras – being used in illegal or inappropriate manners
20.3 Explain why it is important for the customer to sign-off on the Job and work specifics
20.4 Explain the importance of federal/state/local license requirements for residential electronics installer companies
20.5 Describe how to handle systems malfunctions damage-control when the system has a component failure
20.6 Describe the methods used for conflict resolution

21.0 Change Orders

21.1 Explain the purpose of the pre-installation change-order agreement with the contractor
21.2 Explain the purpose of the pre-installation change-order agreement with the homeowner
21.3 Explain why time restraints for change order requests – signatures are required.
21.4 Explain problems associated with the change order agreement work-is-in-progress events and why this needs special handling

22.0 Safety

- 22.1 Describe worker safety programs for Integrators
- 22.2 Describe the safety program for the homeowner
- 22.3 Describe safety programs for subcontractors/contractor
- 22.4 Explain the purpose and methods of lockouts and tagging of system components

Recommended Study Material:

Introduction to Residential Technologies, Bedrock Learning – Course Guides/Online Training
Home Theater Design and Installation, Bedrock Learning – Course Guides/Online Training
Home Networking for Installers, Bedrock Learning – Course Guides/Online Training
Fundamentals of Structured Wiring, Bedrock Learning – Course Guides/Online Training
Residential Lighting Control, Bedrock Learning – Course Guides/Online Training
Whole House Audio Technology and Distribution, Bedrock Learning – Course Guides/Online Training
RESI Basic Skills & Knowledge; EITPrep LLP, ISBN 1581220847
RESI Audio/Video; EITPrep LLP, ISBN 1581220871
RESI Computer Networking Endorsement; EITPrep LLP, ISBN 9781581221022
RESI Audio and Video Systems Endorsement; EITPrep LLP, ISBN 9781581221039
RESI Home Security and Surveillance Systems Endorsements; EITPrep LLP, ISBN 9781581221046
RESI Environmental Control Endorsement; EITPrep LLP, ISBN 9781581221053
HTI+ Certification – Concepts and Practice, Chuck Brooks, 4th Edition; Pearson Prentice Hall; ISBN 0131147722

