

## Appendix A: CTS Exam Content Outline

The CTS exam specifications were developed by combining the importance, criticality, and frequency data obtained from the Job Task Analysis study conducted in 2012. The resulting data were converted to percentages and the percentages were used to determine the number of questions related to each domain and task that should appear on the multiple-choice CTS examination. The test specifications in the table below list how many questions are included in each Domain and Task and the percentage of the test included in each domain. The Job Task Analysis Final Report can be downloaded at [www.AVIXA.org/cts](http://www.AVIXA.org/cts) under "CTS Resources".

Domains/Tasks	% of Exam	# of Items
<b>Domain A: Creating AV Solutions</b>	<b>61%</b>	<b>61</b>
Task 1: Conduct site survey	6%	6
Task 2: Gather customer information	6%	6
Task 3: Evaluate site environment (acoustics, lighting, seating, finishing, etc.)	6%	6
Task 4: Maintain awareness of changes to the site environment (acoustics, lighting, seating, finishing, etc.)	6%	6
Task 5: Develop a functional AV scope	8%	8
Task 6: Design AV solutions	12%	12
Task 7: Sell AV solutions	5%	5
Task 8: Conduct vendor selection process	4%	4
Task 9: Provide AV solutions	8%	8
<b>Domain B: Operating AV Solutions</b>	<b>16%</b>	<b>16</b>
Task 1: Operate AV solutions	6%	6
Task 2: Conduct maintenance activities	5%	5
Task 3: Manage AV solutions/operations	5%	5
<b>Domain C: Conducting AV Management Activities</b>	<b>11%</b>	<b>11</b>
Task 1: Project Manage AV projects	5%	5
Task 2: Perform AV Finance and Job Costing Activities	6%	6
<b>Domain D: Servicing AV Solutions</b>	<b>12%</b>	<b>12</b>
Task 1: Troubleshoot AV solutions	7%	7
Task 2: Repair AV solutions	5%	5
<b>Total</b>	<b>100%</b>	<b>100</b>

NOTE: Applicants and stakeholders should download the most up-to-date free edition of the CTS Candidate Handbook that may include important policy and procedure updates by going to the AVIXA website at [www.AVIXA.org](http://www.AVIXA.org).  
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## CTS Examination: Job Task Analysis

A detailed job task analysis is available on the CTS Exam Resource page of AVIXA's website. Visit [www.AVIXA.org/cts](http://www.AVIXA.org/cts)

### Domain A: Creating AV Solutions

#### Task 1: Conduct site survey

##### Knowledge of:

- Conversions (metric system, etc.)
- Questioning techniques
- Health and safety regulations
- Use of Personal Protective Equipment (PPE)
- Site-specific safety requirements
- Observing and documenting site conditions

##### Skill In:

- Calculating areas and volumes
- Communicating concisely
- Measuring
- Reading blueprints
- Recording data
- Basic math
- Listening techniques
- Observational techniques
- Written communications
- Reading plans and blueprints

### Domain A: Creating AV Solutions

#### Task 2: Gather customer information

##### Knowledge of:

- Customer service techniques
- Negotiation techniques
- Scale drawings

##### Skill In:

- Basic math
- Listening techniques

### Domain A: Creating AV Solutions

#### Task 3: Evaluate site environment (acoustics, lighting, seating, finishing, etc.)

##### Knowledge of:

- Customer service
- Scale interpretations
- Advanced math (algebra, logarithms, geometry, trigonometry)
- Health and safety regulations
- Material Safety Data Sheets (MSDS)
- PPE
- Site-specific safety requirements
- Scale drawings
- Space acoustics
- Sight lines
- Ambient and artificial lighting
- Furniture and furniture layouts

##### Skill In:

- Basic reading
- Written communication

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- Room finishes (materials, colors, etc.)
- Services (power, data, cable access, HVAC, ICT, etc.)
- Historical and heritage considerations
- Zoning and planning considerations
- Building regulations (Code) considerations
- Space plans

## Domain A: Creating AV Solutions

### Task 4: Maintain awareness of changes to site environment (acoustics, lighting, seating, finishing, etc.)

#### Knowledge of:

- Customer service
- Scale interpretations and scale drawings
- Space acoustic treatments
- Changes to sight lines
- Ambient and artificial lighting
- Management of lighting
- Furniture room finishes (materials, colors, etc.)
- Services (power, data, cable access, HVAC, ICT, etc.)
- Substructure (walls, ceiling height, etc.)
- Structure (hanging points, wall supports, etc.)
- Historical and heritage considerations
- Zoning and planning considerations
- Building regulations (Code) considerations
- Space planning solutions

#### Skill in:

- Basic reading
- Written communication
- Advanced math skills- algebra, logarithms, geometry, trigonometry

## Domain A: Creating AV Solutions

### Task 5: Develop a functional AV scope

#### Knowledge of:

- Compiling customer and site information
- Presenting findings to customers
- Financial calculations
- Technical writing

#### Skill in:

- Interpersonal communication
- Conducting presentations
- Written communications
- Drawing and sketching

## Domain A: Creating AV Solutions

### Task 6: Design AV solutions

#### Knowledge of:

- AV solution components
- Developing block diagrams
- Creating specifications and drawings
- Creating a bill of materials (BOM)
- Calculating heat generation
- Calculating light levels
- Calculating power consumptions
- Calculating room layouts
- Calculating sound levels
- Conducting equipment needs calculations (projector lumens, amplifier wattage, speaker taps, screen gain/size, etc.)
- Basic drafting
- Technical writing

#### Skill in:

- Basic and advanced math
- Customer relationships
- Presentations
- Written communications
- Measuring distances and scaling

## Domain A: Creating AV Solutions

### Task 7: Sell AV solutions

#### Knowledge of:

- Developing and presenting a proposal
- Obtaining customer feedback
- Negotiating an AV contract
- Creating maintenance contracts
- Customer service
- Training techniques

#### Skill in:

- Interpersonal communications
- Listening
- Negotiation
- Presentation
- Sales
- Verbal communication
- Written communication

## Domain A: Creating AV Solutions

### Task 8: Conduct vendor selection process

#### Knowledge of:

- Reviewing proposals submitted by others
- Seeking clarification for vendors and providing feedback to vendors
- Calculating heat generation
- Calculating light levels
- Calculating power consumptions
- Calculate room layouts
- Calculating sound levels
- Conducting equipment needs calculations (projector lumens, amplifier wattage, speaker taps, screen gain/size, etc.)

#### Skill in:

- Basic and advanced math
- Basic reading
- Interpersonal communication
- Interviewing techniques
- Presentation
- Written communication

- Design calculations
- Financial calculations

## Domain A: Creating AV Solutions

### Task 9: Provide AV solutions

#### Knowledge of:

- Developing content
- Installing and setting up equipment
- Manufacturing equipment
- Developing designs and specifications
- Programming AV equipment
- Configuring network systems
- Configuring AV equipment
- Designing user interfaces
- Producing user interfaces
- Commissioning systems
- Creating documentation (user manuals, maintenance reports, etc.)
- Training users
- Producing AV events
- Measuring
- Cable management
- Soldering
- Pulling cables and wires
- Basic carpentry
- Affixing anchors
- Cutting and drilling structures
- Sawing wood
- Terminating
- Threading
- Grounding (Earthing)
- Labeling
- Rack dressing
- Networking
- Testing methods
- Electrical safety
- Fall prevention and protection
- Health and safety regulations
- Ladder, scaffolding, and powered lift safety
- Materials handling
- PPE
- Site-specific safety requirements
- Installation techniques

#### Skill in:

- Basic reading
- Listening
- Written communication
- Scheduling

## Domain B: Operating AV Solutions

### Task 1: Operate AV solutions

#### Knowledge of:

- Proper equipment operation
- Daily preventative maintenance techniques
- Conducting solution shut-down activities
- Completing documentation (daily logs, etc.)
- Customer service
- Materials handling safety
- Health and safety regulations
- Lifting safety
- Material safety data sheets (MSDS)
- Site specific safety requirements
- Safety associated with working at heights

#### Skill in:

- Interpersonal communication
- Listening
- Presenting
- Verbal communication
- Written communication

## Domain B: Operating AV Solutions

### Task 2: Conduct maintenance activities

#### Knowledge of:

- Maintaining AV solutions
- Preventative and first-line maintenance of equipment (lamp life, filters, consumables, etc.)
- Conducting solution check-outs
- Testing and certifying leads and equipment
- Documenting maintenance results
- Cable management
- Calibrating systems and equipment
- Customer service
- Grounding
- Labeling
- Rack dressing
- Testing methods
- Electrical safety
- Networking
- Health and safety regulations
- High voltage safety
- Ladder safety
- PPE

#### Skill in:

- Basic reading
- Interpersonal communication
- Listening
- Verbal communications
- Written communications
- Affixing anchors
- Pulling wires and cables
- Soldering
- Terminating
- Threading

## Domain B: Operating AV Solutions

### Task 3: Manage AV solutions/operations

#### Knowledge of:

- Liaising with third-party users and stakeholders
- Ensuring the security of equipment
- Monitoring usage and availability of solutions
- Scheduling usage of solutions
- Managing stock and material levels
- Conducting customer service activities
- Liaising with vendors and suppliers
- Conducting training
- Maintaining professional skills and knowledge
- Conducting administrative work (billing, purchasing, documentations, recording, etc.)
- Conducting strategy planning (long and short term)
- Conducting basic troubleshooting
- Coordinating maintenance and service
- Calculating profit and loss
- Estimating
- Financial calculations
- Utilization calculations
- Fire safety practices
- Life safety issues
- Public safety issues
- PPE

#### Skill in:

- Interpersonal communication skills
- Calculating stock levels
- Presentations
- Scheduling
- Verbal communications
- Written communications

## Domain C: Conducting AV Management Activities

### Task 1: Project manage AV projects

#### Knowledge of:

- Producing project documentation (Gantt charts, timelines, progress reports, etc.)
- Managing changes (Request for Information [RFI], change orders/variation orders [CO/VO], etc.)
- Coordinating site activities (between contractors, etc.)
- Reviewing project documentation
- Coordinating resources (vans, labor, tools, etc.)
- Ensuring health and safety per local regulations/codes

#### Skill in:

- Basic math
- Conflict resolution
- Interpersonal communication
- Listening
- Verbal communication
- Written communication
- Scheduling

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- Project meetings
- Managing project activities according to a schedule
- Ensuring project budgets are met
- Obtaining customer confirmations (sign-offs, documentation, etc.)
- Conducting job costing activities
- Maintaining vendor/supplier relationships
- Customer service

## Domain C: Conducting AV Management Activities

### Task 2: Perform AV finance and job costing activities

#### Knowledge of:

- Identifying and calculating quantities (equipment, materials, services, content, tools, and labor)
- Producing lists (equipment, materials, services, content, tools and labor)
- Estimating AV costs (equipment, materials, services, content, tools and labor)
- Estimating other project costs (fees, permits, bonds, financial costs, insurance, travel, etc.)
- Gathering field reports and time sheets
- Producing estimates
- Reviewing estimates, purchase orders and proposals
- Identifying vendors and suppliers
- Confirming pricing and equipment lead time
- Alternative AV equipment, materials and resources for jobs.
- Analyzing project expenses
- Analyzing utilization rates
- Evaluating job progress
- Producing progress/stage/interim invoices
- Creating project profit and loss documents
- Purchasing techniques (equipment, materials, services, content, tools and labor)
- Vendor relationship techniques
- Negotiation techniques
- Calculating conduit
- Calculating labor utilization
- Basic accounting
- Calculations of margins, percentages and mark-ups
- Manpower calculations

#### Skill in:

- Basic and financial math
- Interpersonal, verbal and written communication
- Conflict resolution
- Presentation skills
- Entering data



## Domain D: Servicing AV Solutions

### Task 1: Troubleshoot AV solutions

#### Knowledge of:

- Warranty and maintenance agreements
- Project documentation (operational manuals, drawings, source code, etc.)
- Inspection techniques (visual, etc.)
- Developing troubleshooting strategies (methods and steps)
- Performing diagnostics
- Recreating and confirming problem symptoms
- Corrective actions (repairs, replacements, removals, etc.)
- Calculating throw distances
- Measuring signal levels
- Customer relationship skills
- Documentation techniques
- Fabrication
- Negotiation techniques
- Aligning a projector
- Calibrating color balance
- Calibrating test meters
- Basic carpentry
- Terminating
- Installation techniques

#### Skill in:

- Basic reading
- Conflict resolution
- Interpersonal, verbal and written communication skills
- Listening

## Domain D: Servicing AV Solutions

### Task 2: Repair AV solutions

#### Knowledge of:

- Corrective actions
- Documenting problems and resolutions (maintenance logs, materials, time, travel, billables, etc.)
- Ohm's Law
- Calculating throw distances
- Measuring signal levels
- Reading technical drawings
- Conflict resolution techniques
- Fabrication
- Documentation
- Voltage calculations

#### Skill in:

- Basic math
- Basic reading
- Documenting
- Interpersonal, verbal and written communication skills
- Listening
- Negotiation