

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

HIGHER NATIONAL UNIT SPECIFICATION

GENERAL INFORMATION

-Unit number-	D7YL 04
-Unit title-	CLOSED CIRCUIT TELEVISION SYSTEMS AND CIRCUITS
-Superclass category-	XM
-Date of publication- (month and year)	JANUARY 2002
-Originating centre for unit-	SQA

-DESCRIPTION-

GENERAL COMPETENCE FOR UNIT: Developing the knowledge and understanding required to enable the candidate to undertake the installation, commissioning and maintenance of closed circuit television equipment.

OUTCOMES:

1. explain video and telemetry control circuits in typical conventionally-wired and multiplexed systems;
2. identify and describe the current types of power supply circuits;
3. explain the functions and requirements of typical control circuits.

CREDIT VALUE: 1 HN Credit.

ACCESS STATEMENT: Access to this unit is at the discretion of the centre. However, it would be beneficial if the candidate has completed Introduction to the Security Industry CCTV unit and prior knowledge of Electrical/Electronic Principles and Components.

Additional copies of this unit can be obtained from:

The Committee and Administration Unit, SQA, Hanover House, 24 Douglas Street, Glasgow G2 7NQ, (Tel: 0141-242 2168).

At the time of publication the cost is £2.50 per unit (minimum order £5.00).

HIGHER NATIONAL UNIT SPECIFICATION**STATEMENT OF STANDARDS**

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME

1. **EXPLAIN VIDEO AND TELEMTRY CONTROL CIRCUITS IN TYPICAL CONVENTIONALLY-WIRED AND MULTIPLEXED SYSTEMS**

PERFORMANCE CRITERIA

- (a) Describe the uses and limitations of the transmission systems listed in the range statement.
- (b) Explain the main features of telemetry control systems listed in the range statement.
- (c) Explain the use of the shared video and powered cabling systems.
- (d) Describe the effects, with respect to the signal quality due to cable length, on the transmission systems listed in the range.

RANGE STATEMENT

Coaxial cabling, twisted pair. Fibre optic and line of sight free space. Telemetry control, eg. pulse code modulation and carrier frequency, hardwire control. Slow scan, conditional refresh and compression techniques, video transmission on the PSTN. ISPN, frame-relay (widescreen) IP, Ethernet.

EVIDENCE REQUIREMENTS

Written and/or oral evidence which satisfies performance criteria (a), (b), (c), and (d).

OUTCOME**2. IDENTIFY AND DESCRIBE THE CURRENT TYPES OF POWER SUPPLY CIRCUITS****PERFORMANCE CRITERIA**

- (a) Explain the effects of cable length on a supply voltage for a given current.
- (b) Describe methods of overcoming problems associated with supply voltage for typical remote ancillary devices.
- (c) Calculate the voltage drop of supply circuits for various lengths of cable run supplying several devices on the same run.

RANGE STATEMENT

Calculations to predict potential problems with supply voltage over long cabling distances. Open circuit and closed circuit alarm circuits, using electromagnetic relay. Electro magnetic compatibility Code of Practice (BSIA).

EVIDENCE REQUIREMENTS

Written and/or oral evidence which satisfies all performance criteria and covers the range.

OUTCOME**3. EXPLAIN THE FUNCTIONS AND REQUIREMENTS OF TYPICAL CONTROL CIRCUITS****PERFORMANCE CRITERIA**

- (a) Describe the requirement to protect the control circuit wiring with respect to:
 - (i) malicious damage;
 - (ii) accidental damage;
 - (iii) proximity to electromagnetic sources;
 - (iv) ground loop interference.
- (b) Describe the types of circuit configuration used on control circuits for:
 - (i) travel limit of pan and tilt units;
 - (ii) preset positioning of fully functioned cameras in response to alarm inputs.
- (c) Describe method used to initiate control circuits for:
 - (i) movement detection alarms,
 - (ii) VCR operation.

- (d) Describe external transmission techniques:
 - (i) remote monitoring;
 - (ii) control of camera position function eg. pan and tilt.

RANGE STATEMENT

Operate video motion detection interconnection to VCR. Respond to remotely located movement detection equipment. Remotely located telemetry receiving equipment.

EVIDENCE REQUIREMENTS

Written and/or oral evidence which satisfies all performance criteria and covers the range.

MERIT STATEMENT: To gain a pass in this unit, a candidate must meet the standards set out in the outcomes, performance criteria, range statements and evidence requirements.

To achieve a merit in this unit, a candidate must demonstrate a superior or more sophisticated level of performance. In this unit this might be shown in the following ways:

- (i) being conversant with calculations to predict potential problems with supply voltage over long cabling distances;
- (ii) understand the operation of open circuit and closed circuit alarm circuits, using electromagnetic relays;
- (iii) demonstrate the operate video motion detection interconnection to VCR. Respond to remotely located movement detection equipment. Remotely located telemetry receiving equipment.

ASSESSMENT

In order to achieve this unit, candidates are required to present sufficient evidence that they have met all the performance criteria for each outcome within the range specified. Details of these requirements are given for each outcome. The assessment instruments used should follow the general guidance offered by the Scottish Qualifications Authority (SQA) assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Accurate records should be made of the assessment instruments used showing how evidence is generated for each outcome and giving marking schemes and/or checklists, etc. Records of candidates' achievements should be kept. These records will be available for external verification.

SPECIAL NEEDS

Proposals to modify outcomes, range statements or agreed assessment arrangements should be discussed in the first place with the external verifier.

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HIGHER NATIONAL UNIT SPECIFICATION**SUPPORT NOTES**

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SUPPORT NOTES: This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

Outcome 1

The understanding of connection details, of all types of devices as different manufacturers use different telemetry types. The candidate needs to understand how the telemetry control panel and receiving device have to be made compatible through programming.

Outcome 2

Here the candidate must be made aware of some of the equipment that may not be available to them in their current workplace.

Outcome 3

The overall concept how a remote CCTV monitoring centres plays a crucial role in the Security Industry.

NOTIONAL DESIGN LENGTH: SQA allocates a notional design length to a unit on the basis of time estimated for achievement of the stated standards by a candidate whose starting point is as described in the access statement. The notional design length for this unit is 40 hours. The use of notional design length for programme design and timetabling is advisory only.

PURPOSE SQA publishes summaries of HN units for easy reference, publicity purposes, centre handbooks, etc. The summary statement for this unit is as follows: On completion of this module, the candidate will have good knowledge of installing, commissioning and maintain intruder alarm signalling equipment.

RECOGNITION This unit has been developed in conjunction with SQA and is one component of the underpinning knowledge for a PDA in CCTV within the Security Industry.

Many SQA HN units are recognised for entry/recruitment purposes. For up-to-date information see the SQA guide 'Recognised Groupings of Higher National Certificate Modules'.

REFERENCES

1. Guide to unit writing, SQA, 1993 (Code: A018).
2. Guide to assessment, SQA, 1993 (Code: B005).
3. Guide to certification, SQA, 1996 (Code: F025).
4. Notes for unit writers, SQA, 1995 (Code: A041).

For details of other SQA publications, please contact staff in the Sales and Despatch section (Tel: 0141-242 2168) who can supply you with a copy of the publication list (Code: X037).

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