

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
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NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number- 0064208 -Session-1986-87
-Superclass- XJ
-Title- SWITCHING SYSTEMS 2

-DESCRIPTION-

Type and Purpose A specialist module which enables the student to further his/her theoretical and practical knowledge of switching systems used in a telecommunications network.

Preferred Entry Level 04207 Switching Systems 1

Learning Outcomes The student should:

1. know the distinguishing features of the listed Strowger systems;
2. know how trunk calls are connected through local exchanges, GSC's and the transit network;
3. know the need for, and the operation of transmission bridges and signalling relay sets;
4. know the principle of operation of crossbar and reed relay exchanges;
5. know the concept and advantages of stored program control.

Content/Context Corresponding to the Learning Outcomes:

1. (a) numbering schemes and trunking for Strowger non-director exchanges. Group switching centres, and tandem exchanges. Multi-exchange areas and linked numbering schemes. Trunking diagrams showing the position of customers' uniselector and composite uniselector/line finder groups; position of auto-auto relay sets (including metering over junction types), coin and fee checking equipment, and local call timing

- equipment. Standard trunking for first selector levels 1,8,9, and O.
- (b) numbering and trunking for director exchanges. Trunking diagrams showing routing within a director multi-exchange network for own exchange calls, calls to other directly connected exchanges, calls routed via a tandem exchange, code only calls and outgoing STD calls. Advantages of using electronic control equipment in place of A-digit selectors and directors.
2. relevant diagrams and explanations.
 3. auto-auto relay sets and transmission bridges. Use of auto-auto relay set to act as a transmission bridge, to provide dial pulse repetition, and to provide called customer answer signal repetition. Diagrams and operation of capacitor and transformer type transmission bridges.
 4.
 - (a) Principle of operation of TXK1 exchange. Designation of switching stages, number of inlets and outlets on each switch, usual number of switches per switching stage, number of links between switching stages. Trunking diagram showing paths for an own exchange call, an outgoing call and an incoming call. Cause and minimisation of internal blocking. Sketch of circuit elements of path selection and marking between the local transmission relay group and the customer's line. Function of the start shift circuit.
 - (b) Principle of operation of TXE2 exchange. Designation of switching stages, number of inlets and outlets on each stage, usual number of switches per switching stage, and number of links between switching stages. Trunking diagram showing paths for own exchange call, an outgoing call, and an incoming call. Cause and minimisation of internal blocking. Operation of the calling number generator. Directory number to equipment number translation. Sketch of circuit elements of path selection and marking.
 5. Operation of S.P.C. equipment. Block diagram. Mode transition diagram. Advantages of S.P.C.

Suggested Learning and Teaching Approaches

Since the module encompasses the knowledge of specialised telecommunication techniques a traditional approach to teaching is recommended.

The specialist equipment described in the module is available to the student in his workplace, but maximum use should be made in demonstrating the use of components which would be available, e.g., the telephone instrument, uniselectors, reed relays, P.C.B's etc. Computer simulations could greatly enhance the student's understanding of systems, if the equipment is available.

Assessment Procedures

All Learning Outcomes must be validly assessed.

The student must be informed of the tasks which contribute to summative assessment. Any unsatisfactory aspects of performance should, if possible, be discussed with the student as and when they arise.

Acceptable performance in the module will be satisfactory achievement of the performance criteria specified for each Learning Outcome.

The following abbreviations are used below:

LO Learning Outcome

IA Instrument of Assessment

PC Performance Criteria

LO1 IA Written/graphical exercise.

PC The student accurately describes the distinguishing features for a given type of Strowger System.

LO2 IA Tracing exercise utilising schematic diagrams with explanations.

PC The student traces the path of a given required call using a schematic diagram, describing accurately all stages of the connections.

LO3 IA Written short answer test.

PC The student correctly describes the need for and operation of transmission bridges and signalling relay sets.

LO4 IA Written/graphical exercise.

PC The student describes accurately, with all necessary detail, the principles of operation of either:

(a) a crossbar exchange;

or

(b) a reed relay exchange.

LO5 IA Written short answer test.

PC The student describes the concept and advantages of stored program control.

02/10/98