EQUIPMENT NOMENCLATURE
NO. 4M OFFICE
GENERAL EQUIPMENT REQUIREMENTS
NO. 4 TYPE TOLL SWITCHING SYSTEMS

1. GENERAL

1.01 This section covers the approved terms relating to the No. 4M toll switching equipment.

1.02 Reference should be made to the Notes on Equipment Nomenclature which are a part of P.E.C. 777 for terminology which applies in common to this and other telephone equipment until that data are issued in Bell System Practice form in this Division.

2. EQUIPMENT NOMENCLATURE

2.01 No. 4M Toll Switching System (May be abbreviated to Toll Crossbar System): A switching system within a toll central office in which the switching apparatus is generally characterized by the following features:

(a) A selector mechanism, called the crossbar switch consisting of a rectangular field of contact springs arranged in sets and operated on the coordinate principle by horizontal and vertical members.

(b) Common circuits which select and test the switching paths and control the operation of the selecting mechanisms.

(c) A method of operation in which the establishment of connections is directed by mechanisms controlled by keysets in the same office or by pulses received from other offices.

2.02 Crossbar Switch: A unit of switching apparatus consisting of a rectangular field of contact springs arranged in sets and operated on the coordinate principle by horizontal and vertical members. Any set of contacts may be operated by the operation of a selecting magnet, which determines the row, followed by the operation of a holding magnet, which operates the particular set in that row. The contact set then remains operated under the control of the holding magnet. The following are constituent parts of the crossbar switch.

(a) Switch Frame: The rectangular structure on which the various elements of the switch are mounted.

(b) Vertical Unit: The complete assembly of the vertically mounted unit of the switch.

(c) Vertical Unit Base: The supporting structure of the vertical unit.

(d) Multiple Strip: One of the vertical strips of fixed contacts of a vertical unit.

(e) Holding Armature: The armature of the holding magnet including the holding bar.

(f) Holding Bar: The element of the holding armature which presses the selecting fingers against the actuating springs to operate the desired contacts.

(g) Holding Magnet: The magnet of the vertical unit.

(h) Actuating Spring: The spring of the vertical unit which transmits the pressure of the holding bar to the moving contact springs.

(i) Trap: The space between the holding bar and the actuating spring to which the selecting finger is moved preparatory to operating a particular cross point.

(j) Holding Off Normal Springs: The common contact springs of the vertical unit which are operated whenever the holding armature operates.

(k) Retaining Spring: The flat spring which bears against the holding armature and serves the double purpose of a locating and retractile spring.

(l) Selecting Armature: The double armature attached to the selecting bar and actuated by either of two selecting magnets.

(m) Selecting Bar: The horizontal rod carrying the selecting fingers and the selecting armature.

(n) Centering Springs: The springs which determine the normal position of the selecting bar.

(o) Armature Extension: The operating arm of a selecting armature the stud of which engages the centering springs.

(p) Selecting Finger: One of the wires projecting from the selecting bar

which, when the bar is rotated, is positioned to identify the particular set of contacts to be closed by the operation of a holding bar.

(q) Damping Spring: The coil spring on the selecting finger provided for damping the finger.

(r) **Selecting Magnet: The magnet which operates the selecting armature.**

(s) Selecting Off Normal Springs: The common contact springs associated with the selecting armature and operated by it.

(t) Cross Point: The set of springs identified by the operation of one selecting and one holding magnet.

(u) Operated Cross Point: A particular set of contact springs being held in the operated position.

(v) Operating Springs: The moving springs of a cross point.

(w) Test Jack: The extension of the vertical unit multiple provided for temporary electrical access to this multiple.

2.03 100-Point Switch: A crossbar switch with a capacity of 100 cross points.

2.04 190-Point Switch: A crossbar switch with a capacity of 190 cross points.

2.05 200-Point Switch: A crossbar switch with a capacity of 200 cross points.

2.06 Three-Wire Unit or Switch: A unit or switch in which the contact springs are arranged to close three sets of contacts.

2.07 Four-Wire Unit or Switch: A unit or switch in which the contact springs are arranged to close four sets of contacts.

2.08 Five-Wire Unit or Switch: A unit or switch in which the contact springs are arranged to close five sets of contacts.

2.09 Six-Wire Unit or Switch: A unit or switch in which the contact springs are arranged to close six sets of contacts.

Note: Two sizes of units may be combined on the same switch, making for instance a three-wire five-wire switch.

2.10 Primary Incoming Switch: A crossbar switch on an incoming link or extension frame through which connections are made from incoming trunks to incoming links.

2.11 Secondary Incoming Switch: A crossbar switch on an incoming link or extension frame through which connections are made from incoming links to junctors.

2.12 Primary Outgoing Switch: A crossbar switch on an outgoing link or extension frame through which connections are made from junctors to outgoing links.

2.13 Secondary Outgoing Switch: A crossbar switch on an outgoing link or extension frame through which connections are made from outgoing links to outgoing trunks.

2.14 Intertoll Train: The incoming and outgoing link frames and associated equipment through which connections are established to intertoll trunks. Connections to tributary trunks and trunks to call order and inward positions, etc., may be established via either this train or the toll completing train.

2.15 Toll Completing Train: The incoming and outgoing link frames and associated equipment through which connections are established to toll switching trunks and TX trunks. Connections to tributary trunks and trunks to call order and inward positions, etc., may be established via either this train or the intertoll train.

2.16 Combined Train: A train combining the functions of the intertoll train and toll completing train.

2.17 Junctor: A circuit extending between incoming and outgoing link frames and terminating in a switching device on each frame.

2.18 Intertoll Junctor: A junctor in the intertoll train.

2.19 Toll Completing Junctor: A junctor in the toll completing train.

2.20 Trunk Assignment Patching Jacks: The pair of patching jacks (block jack and drop jack) by which assignments of trunk block terminals to trunks may be made on a temporary basis.

2.21 Jump Hunting: An arrangement for temporarily enlarging a trunk group beyond the number of terminals reserved for it on the trunk block relay by patching or cross connecting a block jack to a jump hunt jack at the trunk assignment patching board.

2.22 Trunk Block: A group of 40 trunk terminals cut in simultaneously for test by the marker.

2.23 Trunk Block Connector: A connecting arrangement through which the markers have access to trunk block relays.

2.24 Marker Connector: A connecting circuit arrangement through which incoming or position senders are connected to markers.

2.25 Link Controller Connector (May be abbreviated to Controller Connector): A circuit through which a link (sender, operator loop, or repeater) is connected to a link controller.

2.26 Incoming Connector: A connecting arrangement through which markers control switching operations on incoming link frames.

2.27 Outgoing Connector: A connecting arrangement through which markers control switching connections on outgoing link frames.

2.28 Incoming Trunk Circuit: A trunk circuit extending an incoming trunk to one or more incoming link frames. The incoming trunk circuits contain relay and other equipment for performing necessary functions.

2.29 Outgoing Trunk Circuit: A trunk circuit extending from one or more outgoing link frames to an outgoing trunk. The outgoing trunk circuit contains relay and other equipment for performing necessary functions.

2.30 Two-Way Trunk Circuit: A trunk circuit combining the functions of incoming and outgoing trunk circuits.

2.31 Overflow Trunk Control Circuit: A circuit arrangement associated with an intertoll or two-way tributary trunk group which signals by a slow flash to the calling operator when all trunks in the group are busy and which changes to a rapid flash when one or more trunks become idle.

2.32 Overflow Trunk Circuit: A trunk circuit to the overflow trunk control circuit. One or more are provided per trunk group depending on the size of the group.

2.33 Master Busy Trunk Circuit: A trunk circuit to which calls are routed when all intertoll trunks and all overflow trunks in the desired group are busy.

2.34 Holding Trunk Circuit: A trunk circuit to which intertoll trunks can be connected for holding.

2.35 Reorder Trunk Circuit: A trunk circuit to which incoming trunks are connected to give a reorder signal (rapid flash).

2.36 Repeater Cut-In Relay Circuit: A relay circuit associated with a trunk circuit for connecting the trunk to a repeater link when a switched-in repeater is required.

2.37 Incoming Sender: A sender called in by an incoming trunk and taking its registration from pulses over the trunk. It transfers its code digits to the marker, which controls the selection of an outgoing trunk, and then spills its remaining digits, if any, into an outgoing sender. An incoming sender may be of the following types depending on the type of pulses received.

(a) Key Pulsing Incoming Sender.

(b) Dial Incoming Sender.

(c) Multi-frequency Incoming Sender.

2.38 Position Sender: A sender associated permanently with a crossbar toll switchboard position which receives its registrations from the operator's keyset and functions otherwise as an incoming sender.

2.39 Outgoing Sender: A sender called in by an outgoing trunk which receives its registration from an incoming or position sender (or under some conditions directly from a position keyset) and directs the further progress of the call. Outgoing senders are of two types depending on the manner by which they send the information forward.

(a) Revertive and PCI Outgoing Sender: An outgoing sender arranged for operation with outgoing trunks to panel and crossbar offices on a revertive pulse basis and to manual offices on a panel call indicator basis.

(b) Step-by-Step and Call Announcer Sender: An outgoing sender arranged for operation with outgoing trunks on a step-by-step pulsing basis and to manual trunks on a call announcer basis.

2.40 Toll Completing Marker: A marker which controls connections through the toll completing train.

2.41 Intertoll Marker: A marker which controls connections through the intertoll train.

2.42 Combined Marker: A marker which controls connection through a combined train.

2.43 Incoming Link: A switching arrangement for connecting incoming trunk circuits to junctors.

2.44 Outgoing Link: A switching arrangement for connecting junctors to outgoing trunk circuits.

2.45 Incoming Sender Link: A switching arrangement provided principally for connecting incoming and two-way trunk circuits to incoming senders. It is also used for connecting two-way trunk circuits to outgoing senders and may be used for connecting outgoing trunk circuits to outgoing senders.

2.46 Outgoing Sender Link: A switching arrangement for connecting outgoing trunk circuits to outgoing senders.

2.47 Operator Loop Link (May be abbreviated to Operator Link): A switching arrangement for connecting incoming or two-way trunk circuits to operator loops.

2.48 Repeater Link: A switching arrangement for connecting switched-in repeaters to outgoing or two-way trunk circuits.

2.49 Operator Loop: One of a group of circuits provided per position for furnishing access via operator loop links between the operator and incoming and two-way trunk circuits for establishing and, where necessary, supervising connections.

2.50 Link Controller (May be abbreviated to Controller): A circuit arrangement for controlling the operation of sender, operator or repeater links in associating trunk circuits with senders, operators, or repeaters respectively.

2.51 Switched-In Repeater: A telephone repeater which may be associated with an outgoing (or two-way) trunk for the duration of a call.

2.52 Block Relay Frame: A frame containing the trunk block relays.

2.53 Incoming Link Frame: A frame containing incoming links and other equipment for connecting incoming trunk circuits to junctors.

2.54 Outgoing Link Frame: A frame containing outgoing links and other equipment for connecting junctors to outgoing trunk circuits.

2.55 Incoming Sender Link Frame: A frame containing incoming sender links.

2.56 Outgoing Sender Link Frame: A frame containing outgoing sender links.

2.57 Repeater Link Frame: A frame containing switched-in repeater links.

2.58 Operator Loop Link Frame (May be abbreviated to Operator Link Frame): A frame containing operator loop links.

2.59 Trunk Assignment Frame: The cross-connecting frame in a toll crossbar office where the trunks are assigned to trunk block terminals. A trunk assignment frame may serve both the intertoll trunks and the toll completing trunks. When separate trunks are used an Intertoll Trunk Assignment Frame serves the intertoll train and a Toll Completing Assignment Frame serves the toll completing train.