



HISTORICAL RECORD

OF

EXCHANGES

AUCKLAND MAIN AND AUXILIARY TOLL

TOLL GROUP

INTERNATIONAL TOLL EXCHANGES

The service evolved with the advent of the first radio telephone circuits provided by Cable and Wireless and NZPO radio facilities. This service was based on the Wellington Toll Room where a radio suite of adapted Western Electric switchboards was established.

Virtually continuous monitoring of quality and levels of transmission was required of the technician staff. The hours of transmission were reduced by atmospheric and technical difficulties, also the time differences between countries acted as a further restraint.

The early stations were Radio Wellington (Tinakori Hill), Radio Auckland (Musick Point 1942), then Makara 1945 and Himatangi 1953, but the demand was restrained while planning for COMPAC cable system proceeded. The Australian-New Zealand link was opened with temporary relief provided by a 12 channel Carrier Telephone System from Wellesley Street for some months prior to the full commissioning to Australia and beyond by mid 1952, then progressively towards North America and the United Kingdom during 1963.

Part of the Wellington Radio Suite (6 positions) was released and transferred to Auckland to be installed at Civic House (leased premises in Queen Street). This building also housed Auxiliary Toll and was also made available for COMPAC traffic. Because of the limitations of the National Network the Wellington Radio Suite continued to serve some radio circuits until gradually these facilities were extended to Auckland. A CS3 suite was installed to replace the old Radio Suite and when fully commissioned became known as INTL. EXCH. NZ.

Operators positions	12	-	later extended to 18
INTL MULTIPLE (3 sections)	Trunks	80	(Basic)
	Radio	10	(100 lines)
National Multiple		60	
Answers Multiple INTL		80	
Answers Multiple Inland NZ		40	
Outgoing Junction Multiple for Auckland subscribers (part of this multiple shared with Auxiliary Toll)			

This facility coped until 1968 when the total of overseas circuits was in the order of 55-60.

Planning for Satellite Earth Station at Warkworth and the Gateway (AIE 50001 X Bar Exchange) began, and the availability of ATC building at Airedale Street saw the work commence with a cutover to the INTL Exchange on the 6th floor using CS3 switchboards (BFO adaption) in March 1969.

Operators positions 24	Booking positions 8
INTL Multiple (3 sections)	
Trunks 80 (Basic	Pricing 4
Radio 10 100lines)	Directory Service 2
Standby 10	
National Trunk Multiple 40	- Semi Automatic Working
Outgoing Junction Mtpic 80	(National Tandem Switching
Answering Non Controlled 40	Evolving)
Special Answering 60	Serving 63 overseas ccts
Answering Controlled 120	

By 1971 several overseas countries were operator dialling direct into New Zealand and USA initiated International Subscriber Dialling. The first extension increased operators positions to 36 with Suite 1 as 1-27 and Suite 2 as positions 28-36. The answering controlled multiple increased to 140 and circuits exceeded 100.

Extension 2 in late 1972 saw the operators positions further extended to 48 and the extra circuit capacity for the Satellite Earth Station at Warkworth.

Suite 1 Positions 1 - 27)	
Suite 2 Positions 27 - 36)	Directory positions extended to 4.
Suite 3 Positions 37 - 48)	

International Multiple increased to 120	} Overseas circuits now 160
Outgoing Junction multiple increased to 100	
Answering controlled multiple to 220	

In 1974 further extensions became necessary and planning for Tasman Cable System was well advanced.

Suite 3 was extended to 58 positions)	
INTL multiple increased to 140	} Overseas circuits to 208
National trunks increased to 60	
Answering multiple increased to 240	

A decision was made to replace the Gateway Exchange with NEC 829 Crossbar to match the ZCX equipment and for a new International Exchange using NEC cordless operators positions.

Some new NEC cordless positions were cutover on the 6th floor of ATC building before Christmas 1978/79 prior to commissioning the new Gateway Crossbar Exchange, because Block 1A of the ATC complex was still under construction and the heavy traffic demanded relief. For the same reason some of the old auxiliary Toll facilities were recommissioned and called (Auxiliary International Interim Extension) with 17 GSS positions having access directly to 20 Australian circuits and waylines to TMX and International. This additional facility was staffed at peak traffic periods with a provision to busy when not attended.

AUXILIARY TOLL - HISTORICAL

By 1959 the Wellesley Street TXM and exchange building accommodation problems necessitated temporary premises at CIVIC HOUSE being leased for TOLL expansion because the projected ATC would not be available in time to meet demand.

The policy of extending the "free calling area" as exchanges were automated was also lagging, and so a concept of "90" short haul toll traffic division from "0" demand work was evolved.

CIVIC HOUSE: Initial 15 (GS 3 type) switchboards to cater for Otahuhu, Titirangi and Henderson were made operational for Christmas 1960 traffic with continuous construction over a period of 18 months into 1961.

TRUNK MULT 200 lines capacity (Lines shared with Wellesley Street TXM)
ANSWERING MULT 200 lines
O/G JUNC MULT 200 lines

The suite was extended by 6 more positions to 21 in 1961 and the area served extended to include Papatoetoe, Howick, (Manurewa and Pakuranga outgoing). The Radio Suite was also installed as the transfer of International Exchange from Wellington to Auckland for the preparation for "COMPAC" began. There is a separate detailed INTN'L EXCH. historical record.

Then in 1962 a Cable Suite of some 12 positions was readied for COMPAC cutover.

To ease the load on Wellesley Street TXM Directory Service was transferred with 8 positions late 1961 also.

MAJOR EXTENSION: In 1963 a major extension of 24 additional positions from overseas. Then by local MS to 60 positions now arranged, Suites A 1-24, B 25-42, C 43-60 and a further 6 at the end of the "C" suite were an extension of the adjacent INTN'L EXCHANGE until Gateway exchange at ATC eventuated. By this stage the step tandem exchange at Wellesley Street II was effective and the trunk multiple and O/G JUNC Multiple were merged, there being some 35 transfer circuits to Wellesley Street TXM. The answering multiples were separate but to cover the gradual withdrawal of staff in light traffic periods early choices appeared on both floor suites.
ANS MULT A 200, B 200, C 200 - Effective 600 capacity
O/G JUNC MULT 400 lines

By 1966 the multiple was 90% full and presenting some staffing problems spread over two floors and with ATC cutover closer.

ATC CUTOVER 1968

The O/G JUNC MULT was increased to 420 lines and the "C" suite answering multiple increased to 240 lines and Directory Answering Service increased to 12 positions with auxiliary turrets and a CALL CONCENTRATOR and Calls Waiting Indicator circuitry added to improve what had become an indifferent service to subscribers. When INTN'L exchange was established at ATC early in 1969 the "C" suite extended to include the extra 6 positions making a total of 66 POSITIONS at Aux. Toll on "90" work. It is also of note that 24 wayliners to INTN'L exchange were required for work from the exchanges served by Auxiliary toll.

By 1970 the automation of exchanges and extension of free calling area started to reduce "90" traffic and relief to Wellesley Street TXM on "0" demand work was possible with 50 circuits from Whenuapai, Papatoetoe, Otara and Otahuhu diverted and multiple increases to ANS MULT. A 200, B 240, C 240 - effective 660 lines
O/G JUNC MULT 420 lines
Directory service further increased to 18 positions plus 2 turrets.

EXTENSION 3. The "D" Suite of 19 positions was organised from New Zealand Post Office resources for completion NOVEMBER 1974.

Operators A 1-24, B 25-42, C 43-66, D 67-85 and the multiples were O/G 420 A/B/C, with D 80 lines Ans A 230, B 260, C 280, D 160 with the "D" suite effective in handling the remaining "90" traffic and the other suites function as AUX, MAIN TOLL on "C" demand traffic. So that staff could be withdrawn at light staffing periods some of the D suite multiple appearances had to be paralleled on the A&E suites.

By 1976 the "90" traffic had further declined and with the NEC crossbar LXX cutover replacing the step tandem which had functioned at ATC from 1968 there was a further adjustment to the circuits available in the O/G JUNC multiple because CIVIC HOUSE was now effectively AUX, MAIN TOLL from MARCH 1976 to the introduction of STD in October 1976. This would be the peak of the STD switching era it must be considered the 85 positions and the 980 line ANS MULT and 500 capacity O/JUNCT mult supplemented Wellesley Street MAIN TOLL.

From mid 1977 the effect of STD was apparent and moves to transfer DIRECTORY SERVICE back to Wellesley Street as the prelude to closing down Aux. Toll at CIVIC HOUSE were started.

"90" closed down at BTY 78 and removal of some equipment commenced. Interim ITMX relief equipment provided by using AUX TXM G53 Suite 'C'.

EXTENSION OF "A" SUITE IN 1938

Operators positions now 14 + 10 total 24.
A new suite had individual timing meters per cord circuit that stopped electrically with subscriber replacing the receiver not requiring the operator observation, check, clocking off the calculagraph - a significant improvement. Engineering use of the multiple gradually worked inwards and through work on the "C" suite. The separate answering multiple gave an additional 100 lines but there is no record of any trunk or out junction multiple increase. The continuing installation of suburban automatic exchanges was removing the rural lines, telephone bureau and closer manual exchanges (places like St Heliers, Takapuna, Onehunga) and carrier systems had extended coverage to the South Island.

Simplex toll dial from outlying group manual exchanges up to 65 miles distant (MERCER to WELLSFORD) using D.C. voltages up to 80V (the safety factor for our own workmen restricted this on open wire aerial circuits) from 1930 onwards had also reduced inward calls and of course, was the prelude to "operator toll dial". The adjacent automatic areas of Hamilton and Whangarei had a duplex dial system from 1934 but the extra distance and line leakage balancing problems made these very prone to weather conditions. However, these methods persisted until the advent of V/F dialling in 1952.

World War II intervened and with policy being to support the United Kingdom, planning was towards New Zealand Post Office designed switchboard based on British Post Office components, again with individual timing meters per cord circuit.

EXTENSION "B" SUITE NZPO DESIGN IN 1946

Operators positions now A10, B14, C14, total 38.
TRUNK MULT (shared) now 300 lines capacity
ANS MULT - Each board separate with coverage of stations so that night service could be concentrated to "A" suite - Effective at 400 lines.

O/JUNC MISC 200 lines. All operators now had access to H.E.O.T. 100 outlets on the basis of some exclusive to each operator and a few common to all, as well. This used a push button dial system. The installation programme in rural areas of RAX and UAX led to operating difficulties because an automatic/dial connection was being established over both front and back cords of the operators universal cord circuit and by 1950 cord circuit modification so the operator could dial over both cords was done. The more effective concentration of inwards and through work on the "C" suite with no timing of calls also meant that these operators could handle more work and the number of cords circuits was increased to 10 per operator from the standard 6 on outwards positions elsewhere.

The demand and shortage of equipment had led to persistent delay and many subscribers were prepared to pay URGENT rates for priority calls. To enable this undesirable but unavoidable situation to be handled the ROUTE DELAY indicator and audible signal, controlled from the supervisors desk after assessing the pile up of calls, had to be installed and became a feature of operating all through the 1950's and 1960's expansion period.

EXTENSION "D" AND "E" SUITES IN 1952

S.T.C. Antwerp Equipment. D suite 20 positions E suite 26 positions.
This more than doubled the capacity to cope with step exchange growth.

OPERATORS POSITIONS A10, B14, C14, D20, E26 - total 84
TRUNK MULT 400
ANS CONT (A&E) 200 Effective 400
(B&D) 200
ANS NON CONT (C) 300
MISC ANSWERING 100
O/JUNC MULT (A&C) 200 (BDE) 240 Effective 440

With the H.E.O.T. 100 outlets shared round the operators still. The F.I.S. (Free line signal) on the new boards contrasted with the BUSY SIGNAL on the older suites but was soon adapted to by the operators.

The introduction of V/F dial and step TANDEM exchanges went a long way to the concept of "one operator" setting up the-call-all over the country and signalled the progressive decline of duplex and simplex toll dial circuits with the limitation on distance previously mentioned.

Growth continued and with the Wellesley Street building accommodation strained, rental premises at CIVIC HOUSE were arranged and a 15 position G.S. 3 (NZPO design/BRITISH MANUFACTURE) was installed taking the total operators positions to 99 by 1959. The concept of "90" and short haul toll traffic from exchanges to be automated and included in the Auckland free calling area was evolved to take the load off MAIN TOLL. Originally this catered for Otahuhu, Titirangi and Henderson, with continuing work into 1960 and 1961 to include Papatoetoe, Howick, Manurewa, Papakura and later Kumeu.

AUCKLAND "TOLL" HISTORICAL

Any early service, with the advent of the telephone, would have had very limited scope because pioneer achievement was still influenced by problems of water-only transport and military requirements following the Maori Wars and land purchase problems.

As a service to the public, it could be said to originate at Port Street, and was based there from 1898 to 1925 associated with the manual switchboards and Strowger step automatic exchange serving the town. Other manual exchanges established up to 1925 were Albany, Avondale, Birkenhead, Devonport, Henderson, Mt Eden, Manurewa, Mercer, Cnehunga, Otahuhu, Panmure/Tamaki, Papakura, Papatoetoe, Remuera, St Heliers, Silverdale, Takapuna, Waiuku.

The Western Electric 7A rotary exchange system was being installed following 1914/18 war and the separate toll room was built in the 1st Floor, Wellesley Street as part of this scheme, and presumably was cut into use in 1925 with that exchange. We have no record of temporary use prior to this.

It must be remembered that the standard "open wire" toll lines of 70lb/mile up to 200lb/mile copper even extended by physical and phantom coil arrangements gave satisfactory transmission for only about 150 miles so that telegrams were the mode for long distance communications to Wellington or beyond. Each of the main centres had its group coverage only. Though the thermionic valve amplifier/repeater and D1 carrier (single channel) systems were introduced from 1929, and some experimental 400lb copper lines were erected between Auckland/Hamilton and Palmerston North/Wellington, it was the middle 1930's before wider toll coverage was achieved.

The major SOUTH TOLL LINES came right down Wellesley Street to terminate at the lead-in pole by the Library just above the exchange. Progressively, these were shortened back to Symonds Street with the advent of Auckland Telephone Centre, then to Manukau Road/Great South Road corner, Harp of Erin, Otahuhu and Papakura by 1974 as underground cable, co-axial cable and microwave systems eventuated.

The NORTH LINES from a similar pole in Wellesley Street West were shortened back to Hobson Street, then Victoria Street viaduct, Curran Street where the cross harbour cable to PUGH'S Beach, Birkenhead started, into aerial again. When Highbury (now Birkenhead) exchange was established the north shore terminal pole was at Onewa Road and this survived until the underground cable systems and microwave associated with the building of Warkworth CA and the Earth Satellite Stations in 1972.

TOLL WELLESLEY STREET FROM 1925

W.E. (London & Antwerp) TOLL BOARD (later "C" Suite) - 10 POSITIONS

Auxiliary Information (DIRECTORY SERVICE), Pricing and Supervisors Departments. A "TIXE" service was also given until local Taxi companies striving for custom took this over about 1925. They, in turn, were glad to unload it to the fledgling Radio Stations of the 1930's. Multiple comparisons are not direct because of the system of "primary" and "secondary" answering positions but by the toll line relay capacity and IDF layout it would be of the order of -

TRUNK	200 capacity
ANSWERING	200 capacity
O/JUNC/MISC	100 lines

There was a rural line section of 50 lines, provision for Hospital/Emergency C.B. (Central Battery) service for the interception of subscribers lines in the event of trouble, and TOLL PAY stations later to be merged with telegraph stations as Telephone Bureau Service with direct access to Toll.

It is understood the first extension of four positions had been lost by sinking of shipping towards the close of the World War I and certainly the additional positions to bring the "C" suite to 14 are slightly different and came into service about 1928 by which time the "electro-mechanical" busy signal was covering all appearances and modification to the layout of the face equipment had absorbed secondary answering and busy lamps with new jack strips to increase the multiple capacity and traffic handled. All timing of calls was by calculagraph.

A separate history of this exchange has been recorded and when looking at the total - operator handled toll traffic - up to the days of S.T.D. must be considered with this. Until now International Telephone Exchange for New Zealand had been at Wellington but with the planning of COMFAC and the decision that cable would come ashore in the Auckland area this was transferred to coincide with the opening of COMFAC in JULY 1962 when a suite of 12 positions was available also at Civic House. A separate historical record is also kept for this exchange.

By 1960 even with the shedding of load to AUX TX the "O" demand traffic had grown and the Wellesley Street toll EXTENSION OF "E" SUITE by 6 more positions was due. MAIN TOLL now A10, B14, C14, D20, E32 total 90. The multiple changes were in the composition of the O/G JUNC Multiple. Increasingly operators were involved in tandem dialling rather than selection of a line to a station so that the TRUNK MULT held at 400 lines and the O/G JUNC effective at 440 plus the availability of H.E.O.T. for rotary exchange calls.

EXTENSION "F" SUITE (EX HAWERA 8 POSITIONS OF ORIGINAL "C" SUITE VINTAGE)
to increase inwards and through capability of switching and brought the total operators positions to 98 in 1963.

With Airedale Street planning advanced and the introduction of "111 EMERGENCY SERVICES" scheduled multiple re-arrangement and extension started in 1967 so that at A.T.C. cutover in September 1966. The old 100 line MISC answer mult was absorbed Wellesley Street TX.

Operators Positions	98
Trunk Mult	500 lines
Ans Cont (A/E)	400
(B/D)	400 effective 800 lines
Ans Non Cont (C/F)	400 lines
O/Junc Mult (A/C)	240
(B,D,F)	240
common	160 effective 640 lines

The H.E.O.T. facility still existed but was becoming less useful as the rotary exchanges and proportion of subscribers reduced.

By 1970 the expansion of trunk network and the slower than anticipated progress in extending the free calling area so phasing out "90" traffic meant increasingly Aux. Toll was now an extension of main toll facilities. Accommodation on the TRUNK MULT was insufficient so temporarily 120 of the 160 line section of the COMMON O/JUNC MULT was used while the splitting of the trunk multiple proceeded.

By 1971 the 98 positions had access to	
common section	100 lines
TRUNK MULT (APC)	400
(B,D,E,F)	400 effective 900 lines
ANS CONT (A&E)	400
(B&D)	400 effective 500 lines
common section	100
ANS NON CONT (C&F)	400 lines
O/JUNC A&C	240
B,D,E,F	240 effective 640 lines
common section	160

The H.E.O.T. facility was abandoned and it was hoped this would cope till the now planned S.T.D. gave relief.

In 1974 the normal rotating dial was replaced with electronic push button type keysenders on all but the "C" suite.

S.T.D. starts to be progressively introduced from OCTOBER 1976 and the new N.E.C. cordless switchboards associated with the EXX at Airedale Street take further traffic from this exchange. The consolidation at APC starts the phasing out of Aux. Toll and auxiliary features like Directory Service now some 18 positions plus 10 turrets are scheduled to be replaced by NEC DSC's at Wellesley Street during 1978.

MAIN TOLL (WELLESLEY STREET)

July 1978

D Suite reduced from 20 to 10 positions.
 E Suite reduced from 32 to 20 positions.
 B Suite retained at 14 positions.
 Recovered A Suite - 10 positions.
 C Suite - 14 positions
 F Suite - 8 positions

This work was done because of the drop in terminating traffic at the 1978 Directory and also to allow installation of Directory Service Consoles.

Effective Multiple as July 1978.

ANS CONT.	E - 400
	B & D - 400
ANS NON-CONT.	E - 100
	B & D - 100
O/G JUNC.	B, D-E - 240
O/G TRK	B, D-E - 400

MARCH 1979

Remaining Toll terminations transferred from AUX TMX.
26 Directory Service Consoles and 8 temporary Directory Service turrets commissioned.

AUXILIARY TOLL(CIVIC HOUSE.)

MARCH 1979

Remaining toll terminations transferred to Main Toll (Wellesley Street)

Directory Service transferred to Directory Service Consoles at Main Toll (Wellesley Street).

17 positions remain in use on C Suite for Auxiliary International TMX.

Auxiliary Toll Finally Closed on 21 January 1980 at 2300 hours.

All equipment was subsequently removed from the building and Civic House vacated completely on 31 March 1980.