COMMUNITY TELEPHONE PLAN

SECTION V - MAJOR PHASES OF IMPLEMENTATION

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1. NEW TELEPHONE POLICY.

1.1 The development of a new national telephone plan with the long term objective of a fully automatic subscriber trunk dialling service has been dealt with in the foregoing Sections. The major phases of implementing the national plan involve action in all Divisions and Branches of the Department, particularly in the Engineering and Telecommunications Divisions, and are discussed briefly in this Section.

During the preparation of the plan, attention was necessarily given to aspects of implementation and a great deal of action has already been completed or is in progress. Much remains to be done to develop plans in detail for smooth and efficient implementation of the plan, of which one of the main features is that it can be introduced in planned stages of development towards the ultimate objective.

The new telephone policy announced by the Postmaster-General in the White Paper entitled "Progress - Policy - Plans" in August, 1959, referred to in Section I, lays the foundations for the future economic and efficient development of the telephone system. It is the first major step in the implementation of the national telephone plan.

2. TARIFF ASPECTS.

2.1 With a subscriber trunk dialling service the adoption of a simplified tariff structure as described in Section III is essential. The main points of the new tariff structure are extended local service areas and the adoption of group charging and multimetering of trunk line calls.

2.2 Group Charging. In order to carry out the grouping of exchanges into charging zones, and the grouping of zones in turn into charging districts, the services of officers with local knowledge of the service, engineering and commercial factors involved in each State were utilised under Headquarters' direction. The task involved consideration of every exchange in the Commonwealth. The group charging scheme necessitated close co-ordination with the national numbering and trunk switching plans and was advanced to the stage where its implications could be ascertained before determining policy.

Work is in progress now within the Administration on the calculation of detailed charges for calls on a zone and district basis and the preparation of advice for distribution to all exchanges.

2.3 Tariff Schedules. In developing the new policy, extensive studies of general tariff aspects were made having regard to the much greater extent of local service areas and the new basis for trunk charging. Amendments to Telephone Regulations are being arranged and a great deal of detailed administrative work is well advanced at Headquarters. Much detailed work is involved in the State organisations, affecting each subscriber's service and every exchange in the Commonwealth.

2.4 Publicity. Introduction of a new system of charging requires publicity for the information of staff and the education of customers. New instructions covering many operational aspects are necessary. Typical publicity measures include information for inclusion in telephone directories, special advice to subscribers and revised public telephone notices. Brochures are being prepared at Headquarters and plans developed to utilise media such as press, radio and television.

3. NUMBERING

3.1 Having prepared 50-year estimates of the extent and distribution of telephone development, an allocation of the higher order numbering was made for the Commonwealth. This allocation of A, B and C digits to particular networks is referred to in Section II.

3.2 Numbering within Areas. The adequacy of the allocations of A, B, and C digits was checked when model numbering within each numbering plan area was carried out in close co-ordination with the charging plan.

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The model numbering scheme, covering each exchange in the Commonwealth is based on full automatic operation with register-controlled switching equipment. It will be of considerable assistance when detailed planning for a particular area is undertaken. The principles discussed in Sections II and III, were the basis for the procedures adopted in allotting the numbering.

Referring to the more general case of 5 digit numbering plan areas, the general procedure adopted was as follows:-

(i) Consider the number and location of charging zones, together with the number of exchanges in each zone having regard to probable amalgamations of existing exchanges or proposed new exchanges. These factors, with the estimated subscriber development for each exchange, comprise the basic data for the allocation of numbering.

(ii) D digits were allotted to the exchange or exchanges serving the Secondary centre, allotting the lowest D digits to the exchanges with the largest volume of terminating traffic. The D digit 0 could not be allotted, being used as trunk access code, and D digit 1 was not allotted at this stage but reserved for possible later use under register control.

(iii) The remaining D digits were allotted in the numbering plan area so that the charging zones are identified by either D or E digits. That is, the F digits for any E digit were not allotted to more than one charging zone. 4.3

Reserve capacity, desirable because of the difficulty of forecasting development accurately for each exchange and the low numbering efficiency where there is a large number of small exchanges, was planned by reserving some of the E digits of each D digit and some of the F digits of each E digit.

(iv) The D digits were allotted in an orderly sequence with the aim of facilitating design of interim numbering schemes and to simplify routing and charging discrimination requirements as far as possible. Each network required examination to determine the optimum arrangement. Where possible, D digits were allotted exclusively to minor switching networks. This enables a certain amount of ultimate numbering to be achieved in early implementation stages with step by step techniques, particularly with regard to the trunking of the main switching centre in the network.

(v) The zones with the smallest volume of terminating traffic were allotted the higher D digits and this principle was generally observed with E and F digits.

(vi) Most country terminal exchanges were designated by DEF codes but when an exchange required more than 3 F digits in the early stages, say 10 years, then a complete E digit was allocated.

4. MANUAL EXCHANGES.

4.1 The full implementation of an automatic subscriber trunk dialling service is a long term objective, and consideration was given in the numbering project to dealing with manual exchanges which will, of necessity, be in operation in the system for many years.

4.2 Numbering. When planning for the introduction of subscriber trunk dialling facilities in an area, each manual exchange will be assigned a unique code in order to provide incoming access. This will consist of the national area code together with an exchange code from the area numbering plan.

Numbering will be used which will facilitate interception when the manual exchange is replaced by an automatic exchange. On conversion to automatic, either the exchange code may be retained or a new code used. The use of a new code would simplify installation and cut-over since work may proceed clear of working levels and interception may be provided at the parent switching centre. However, it may not be practicable to use this method in the case of the larger exchanges numbered with D or DE codes because:

(i) Spare codes may not be available.

(ii) The costs involved in providing a second code for each manual exchange of this size may outweigh the installation difficulties which occur if the manual exchange code were retained.

The charging equipment associated with each zone, in the District containing the exchange and in adjacent Districts, which must examine codes to the D or DE digits would need to be capable of examining extra codes. Also some routing alterations would be required with a new code.

The codes allotted therefore to manual exchanges, where the ten year subscriber development exceeds 300 lines, will consist of D or DE digits followed by the digit 1. No switching stage will be provided to handle this digit; its purpose is to facilitate interception in those cases where the code is retained on conversion to automatic. The codes would be of the form DE1 in five digit numbering plan areas and CDE1 in six digit areas.

Smaller manual exchanges which would be given DEF codes do not incur any changes or complication to the charging equipment if the new code used in conversion is a spare F of the same DE code. These normally would be available and therefore the digit 1 need not be appended to the manual exchange code.

4.3 Methods of Access. Although access to all manual exchanges is required for trunk operators, some restriction is necessary with subscriber-dialled calls, depending on the condition at the manual exchanges.

Some manual exchanges will not be continuously staffed, some will not be served by sufficient trunks and at others neither the circuitry nor the administrative arrangements will be suitable for remote subscriber dialling.

The method of register control described in Section IV will enable access to manual exchanges to be controlled. The appropriate backward signals will be transmitted from the final register encountered in the setting-up to indicate whether or not access is permitted. This does not impose any significant extra requirement on the discriminating ability of these final registers since they will normally be required to examine the exchange prefix digits (D, DE or DEF digits) to effect the routing of the call.

The following sets out alternative treatments of different categories of manual exchanges, which may be used:-

(i) Manual exchanges at which a satisfactory "Called Subscriber Answer" supervisory condition is provided. The C.S.A. signal is returned to the originating exchange to actuate changing equipment which responds as for a call to an automatic exchange. Some CB exchanges are in this class. Subscriber-dialled access may be provided to these exchanges for all incoming calls, provided that the originating exchange is equipped for automatic trunk charging.

(ii) No Automatic C.S.A. Signal.

(a) Manually applied C.S.A. signal. In order to avoid terminal-end docketing, which involves additional accounting work, the C.S.A. signal could be manually applied by the operator. The calls would then be multi-metered as for calls to automatic exchanges. The practicability of the circuit alterations required to provide this facility is being investigated.

(b) Terminal-end docketing acceptable for all incoming trunk calls. The dockets, prepared by the terminal manual operator, would be forwarded to the appropriate accounting centre for the originating exchange.

(c) Terminal-end docketing acceptable only for short-range calls. For these exchanges the trunk codes would be shown only in the directory for the area concerned. However, as the same directory may embrace several numbering plan areas, special instructions would be necessary.

e.g. Fern Creek 0537-622

(May be dialled only by subscribers whose national numbers commence with 0537- . All other subscribers should call their local operator for calls to this exchange).

(d) No satisfactory C.S.A. signal. Terminal-end docketing not acceptable. For exchanges with no C.S.A. signal and where terminal-end docketing is not acceptable, the area codes will not be published in the directory. The exchange listing will be followed by the standard trunk operator code 011, if this is uniformly in use in the directory area, or by the words - "Call your local trunk operator". There may be other reasons for non-publication of a particular exchange trunk code, including a severe shortage of trunk lines to the terminal exchange which would make subscriber-dialling impracticable.

4.4 Operating Facilities. Extended local service areas will result in a much greater percentage of the traffic in an exchange, being handled as local calls. Whilst this will yield operating economies further advantages may be obtained in exchanges with separate local and trunk positions by modification of operating facilities and terminating appearances. Investigation of the possibilities is in progress.

5. SWITCHING EQUIPMENT POLICY.

5.1 Concurrently with the development of the national plan, investigations proceeded in connection with the specifications for equipment to be used in the system. An outline of the probable requirements was given to the principal suppliers of automatic switching equipment and information sought by the Department on system equipment available or under development, which would meet the requirements of the plan. As a result, much valuable information was secured from world-wide resources and senior representatives of overseas manufacturers visited Australia for discussion and to describe and demonstrate new types of switching equipment. Trial installations of new equipment were arranged.

As referred to in Section I, the Department, after thorough investigation has adopted the crossbar system for future development.

Much technical work is required for the application of the system to the Australian network and for the large scale introduction of subscriber trunk dialling facilities.

6. SUBSCRIBERS' FACILITIES

6.1 As the new system is implemented, there will be new requirements for subscribers' facilities. Examples of such requirements, mentioned in Section III, Charging, include the barring of access from some subscribers' services to multi-metered trunk lines and the provision of meters at subscribers' premises to operate in association with the meter at the exchange.

The facilities to be made available on private automatic branch exchanges, including the policy on in-dialling to P.A.B.X. extensions, require determination.

These and other like matters cover a very broad field. Investigations are already in progress, but much remains to be done.

7. PUBLIC TELEPHONES.

7.1 Facilities for callers to use public telephones for multi-metered trunk calls without seeking the help of an operator are desirable. The matter of the type and design of public telephones, incorporating the facilities required for multi-metering, has been under investigation for some time and this work is continuing.

8. NETWORK PLANS.

8.1 The detailed numbering, charging and switching plans which have been evolved as part of the national plan are integral parts of a basic framework within which the planning of individual areas can proceed.

8.2 Sydney and Melbourne Telephone Networks. Comprehensive outline plans are well advanced for the long term development of the Sydney and Melbourne telephone networks. The development of the networks with seven digit operation to cater for the growth in telephones must be co-ordinated with developmental works for the introduction of subscriber trunk dialling. In this way the integration of the existing and new systems in the interests of speed and efficiency will be achieved. The re-design of the telephone networks of these large cities is a major undertaking which will require considerable concentration of effort.

8.3 Outline Plans for other Regional Networks. The national telephone plan covers some 220 regional areas including the Capital Cities, each of which will require detailed plans. The plans will cover a period of approximately 20 years and will show the way the networks will be developed. Intermediate phases require close investigation of saturation dates of existing plant and equipment and appropriate measures directed towards ultimate mechanisation. Work on the plans is being pressed forward so that they my be considered with the preparation of co-ordinated works' programmes. These plans will incorporate information concerning :-

Numbering plan, including special dialling codes.

Switching plan, including both direct and alternate routes.

Junction and trunk channel requirements and provision.

Location of manual assistance centres.

Automatic exchange equipment for local and long distance switching and automatic charging.

Plans for buildings and accommodation.

9. FUTURE PROGRAMMING.

9.1 Developmental projects for the telephone system are arranged as annual programmes of capital works involving considerations of finance, engineering works, sites and buildings. Large quantities of technical plant are required annually. The telephone system is inherently complex and orders for the major items of plant and equipment must be placed one or two years ahead because of the time taken to manufacture and deliver supplies. As indicated in Section IV, the national plan will require the provision, as early as possible, of switching equipment performing additional functions from that at present in use.

The introduction of the zoning plan will yield immediate service and economic advantages by making the maximum use of existing equipment. Some adjustment of the normal developmental programme in the short term will be required, so that as much as possible can be done to prepare for operational conditions at the date of implementation. Other works will be continued subsequently.

It can be expected that traffic will increase on channels between automatic exchanges with local untimed calls when the extended local areas are introduced. Estimates have been made of additional circuits required, what can be provided to enable automatic operation to be introduced, and the cases where it will be necessary to retain operator control of this traffic. Every trunk route in the Commonwealth which connects automatic exchanges and which will become a local link has been analysed.

Apart from short term measures required prior to implementation of the new tariff policy, the features requiring examination to form the basis of future financial policy and works' programming include:-

(i) Levels of demand, priorities, ordering and supply policy.

(ii) Extent of automatic conversion, renewal and modernisation.

(iii) Rate of automatic trunk equipment installations in key centres and introduction of subscriber trunk dialling.

(iv) Level of trunk channel provision, particularly on major routes.

(v) Manual assistance positions - location, type of facilities, number of positions.

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(vi) Introduction of standard service codes and trunk codes.

(vii) Effects on building programme, including relief in present exchanges and reduced manual requirements in proposed buildings.

(viii) Subscribers' facilities and public telephones.

These are the principal requirements having important implications for the major phases of implementation of the long term plans.