

Post Office  
Telecommunications

Datel 600  
Modems  
1 and 20

Datel Service  
Operating Instructions

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## MEMO

FROM	TO
D. LINNEY	MR. T. G. GADD MR. J. D. CLELAND
OUR REFERENCE	YOUR REFERENCE
DL/JAG	22nd January 1978

Please find attached herewith a booklet supplied to us by the Post Office on the Datel Computer System at present in operation at both depots. This provides a useful summary of the system and gives fault finding and checklist exercises on the system and may prove of value in the event of a brakedown.

All Kind Regards,



D. LINNEY

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# 1 Introduction

This booklet describes the procedures for the operation of your Datel 600 Service, and the course of action to be followed if a fault occurs. It should be read in conjunction with any operating

instructions given to you by your data terminal supplier. Any enquiries for further information should be directed to your local Data Customer Service Officer, whose telephone number is shown in Appendix 1.

## 2 Post Office equipment provided

The Post Office equipment provided for the Datel 600 Service consists of a modem at each end of the required telephone circuit. Telephones may also be provided as part of the installation – the arrangements for telephones are shown below in Table 1.

A private circuit telephone may be generally recognised by the dial centre label.

Figures 1 and 2 show the Modem 20 which is used in many Datel 600 installations, and can be recognised by the rotary test switch which can be seen when the front cover of the modem is open (as shown in Figure 2). During normal operation of the service the rotary test switch should be at Position 1 (NORMAL).

Certain installations will use the Modem 1, which has less sophisticated testing facilities than the Modem 20. There is no opening front cover to this modem, and the only button for carrying out testing procedures is located at the rear of the modem.

TABLE 1

Circuits	Telephones
Private circuit with alternative speech facilities and exchange line standby.	Private circuit telephone and exchange line telephone.
Private circuit with alternative speech facilities without exchange line standby.	Private circuit telephone only.
Private circuit without alternative speech facilities with exchange line standby.	Exchange line telephone only.
Private circuit without alternative speech facilities, without exchange line standby.	No telephone provided.
Exchange line only.	Exchange line telephone only.

Figure 1 Front view of modem and associated telephones.



# 3 Establishing a data connection

## General

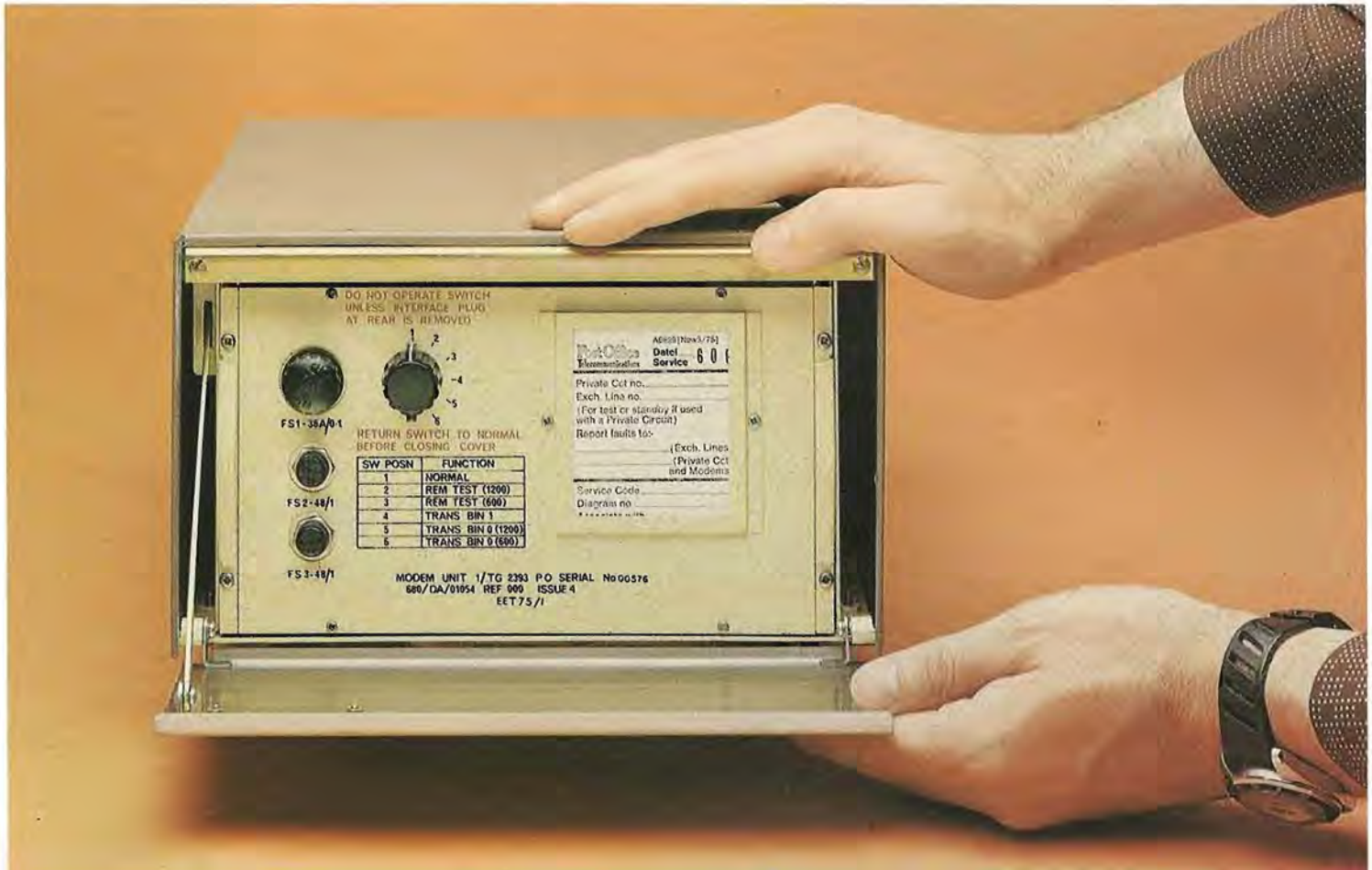
The information in this section describes the more common installations which have one or two modems at each end of the circuit. Where a large number of modems are provided at one location they are generally part of a 'Control System' for which different procedures apply. A guide to 'Control Systems' is available on request and any differences in operation from those described in this guide will be indicated when the service is provided.

Before data transmission may take place, a line connection must be established between the ends of the data communications system and the modems switched to line. Where this connection is to be established through an exchange line, or standby telephone, and the line sounds noisy making speech difficult, it is suggested that you re-dial the required number to obtain a better connection for data transmission.

There are three different methods of switching the modem to line, of which

only one will be provided at any particular installation, the method used depending on the design of the data terminal equipment. The three flow-charts on the following pages each outline one of the methods (Switching Codes R, S or T). The one which applies to your equipment will be indicated at the time of installation. The arrangement of the buttons on the associated telephone is different for each method and the illustrations accompanying each flow-chart show the typical arrangements for the method concerned.

Figure 2 Front of modem with front cover open.



# R Operation of R Switching Codes



Fig R1 Private Circuit telephone showing typical position of CALL button.



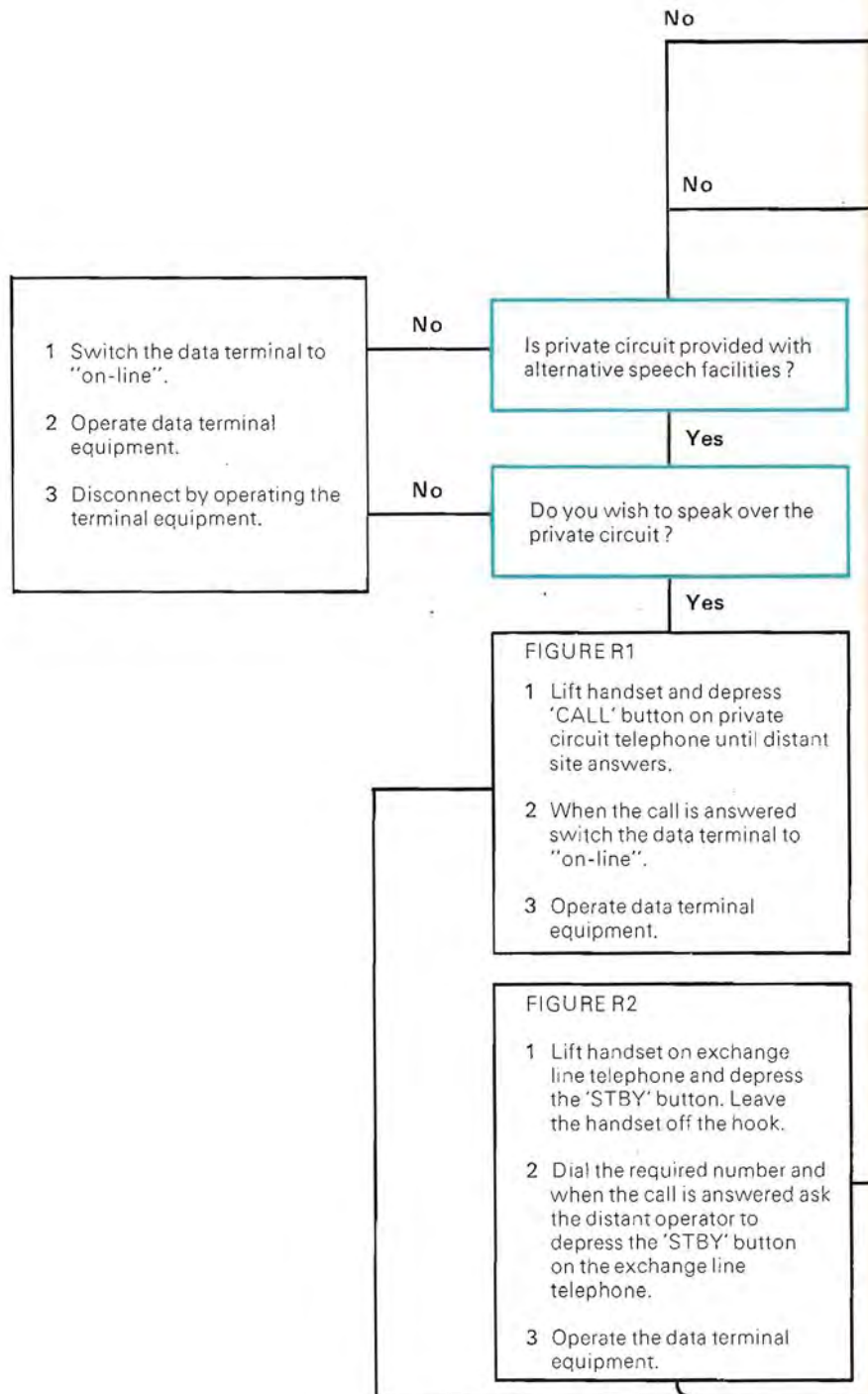
Fig R2 Exchange Line telephone when provided as a standby to a private circuit with alternative speech facilities.

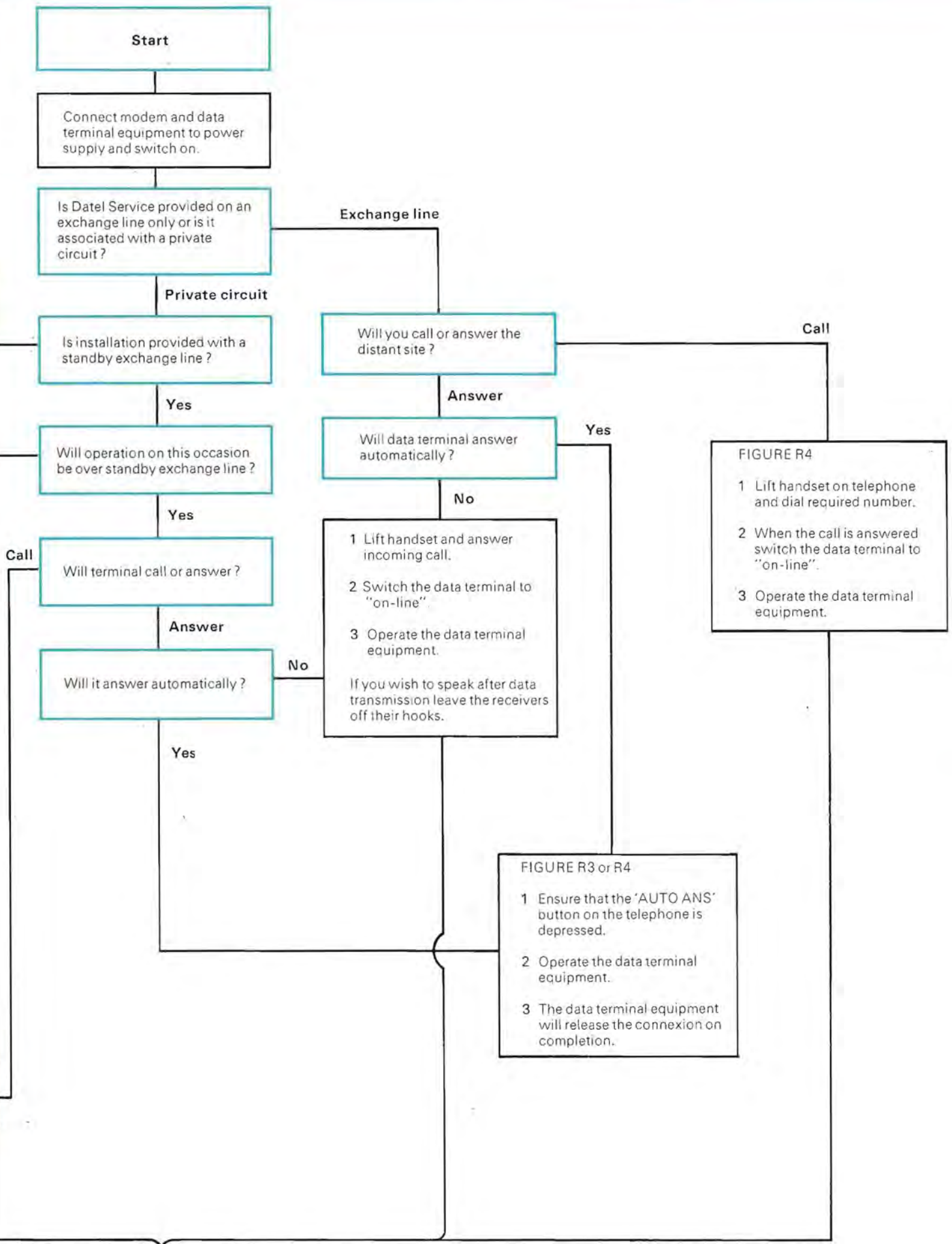


Fig R3 Exchange Line telephone when provided as a standby to a private circuit and where the terminal has automatic answering facilities.



Fig R4 Exchange Line telephone when not associated with a private circuit, showing position of AUTO ANS button.





**FIGURE R4**

- 1 Lift handset on telephone and dial required number.
- 2 When the call is answered switch the data terminal to "on-line".
- 3 Operate the data terminal equipment.

**FIGURE R3 or R4**

- 1 Ensure that the 'AUTO ANS' button on the telephone is depressed.
- 2 Operate the data terminal equipment.
- 3 The data terminal equipment will release the connexion on completion.

To clear the connexion after data transmission has been completed, replace the telephone handset(s) and where applicable, switch the data terminal to the speech mode.

# S Operation of S Switching Codes



Fig S1 Key switch provided on private circuits without speech facilities.



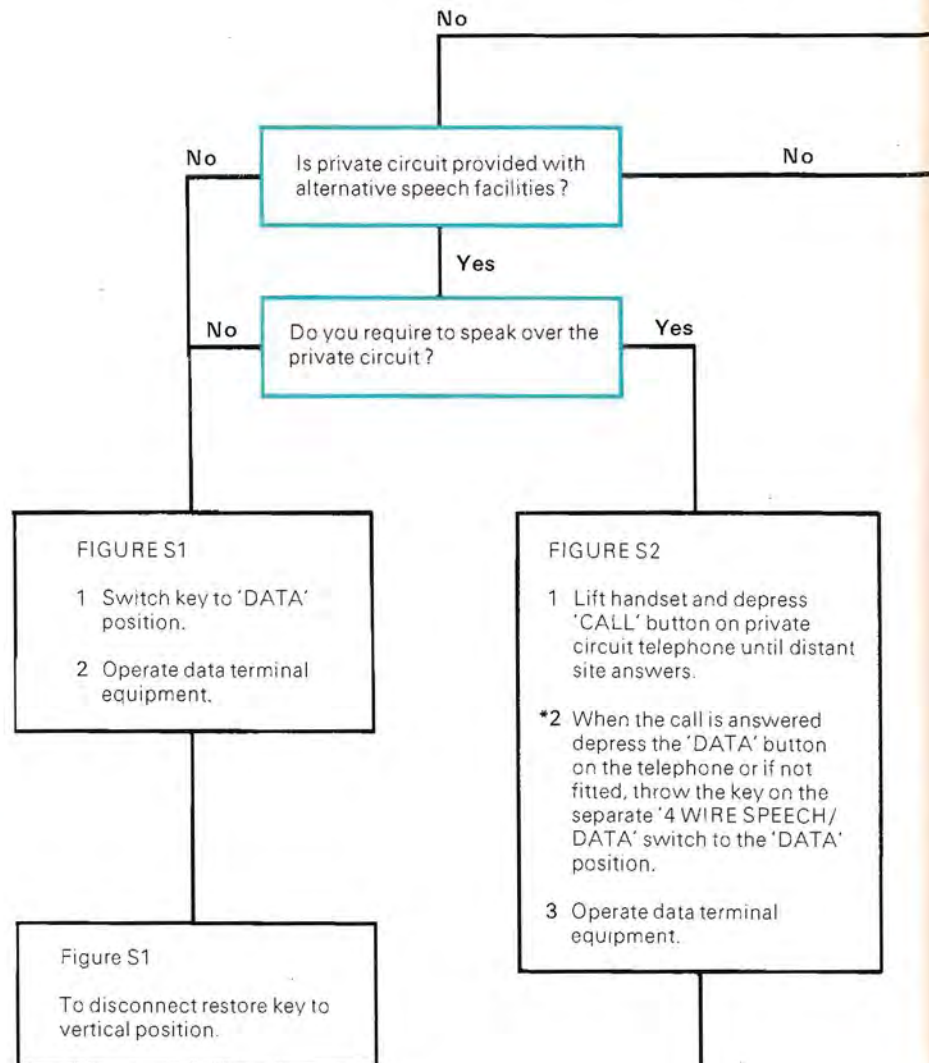
Fig S2 Private circuit telephone where speech facilities are provided. Inset shows alternative switch to 'DATA' button on telephone.



Fig S3 Private Circuit telephone when provided on an installation with a standby exchange line.



Fig S4 Exchange Line telephone when not associated with a private circuit.



**\*SWITCHING THE DATA TERMINAL TO THE DATA MODE.**  
On most installations this is done by operating the 'DATA' switch as described in the flow chart. On some installations however it will be necessary to agree with the distant site which direction the data will be sent and then to depress a 'SEND DATA' or a 'REC DATA' button fitted on the telephone.

Start

Connect modem and data terminal to power supply and switch on.

Is Datel Service provided on an exchange line only or is it associated with a private circuit?

Private circuit

Is installation provided with a standby exchange line?

Yes

Will operation on this occasion be over standby exchange line?

Yes

FIGURE S3

- 1 Lift handset on standby telephone and depress the 'STBY' button.
- 2 Dial required number and when the distant site answers the 'STBY' button on that telephone should also be depressed.
- \*3 Leave the handsets off their hooks and depress the 'DATA' button on your telephone.
- 4 The distant site should also depress their 'DATA' button.
- 5 Operate the data terminal equipment.

If you wish to speak after data transmission depress the 'TELE' button on the telephone or if not fitted, throw the key on the separate '4 WIRE SPEECH/DATA' switch to the '4 WIRE SPEECH' position. To clear a connexion replace the telephone handsets.

Exchange line only

Will you call or answer the distant site?

Answer

Call

FIGURE S4

- 1 Lift handset and answer incoming call.
- \*2 Depress 'DATA' button.
- 3 Operate data terminal equipment.

FIGURES 4

- 1 Lift handset on telephone and dial required number.
- \*2 When the call is answered depress the 'DATA' button.
- 3 Operate data terminal equipment.

# T Operation of T Switching Codes



Fig T1 Key switch provided on private circuits without speech facilities.



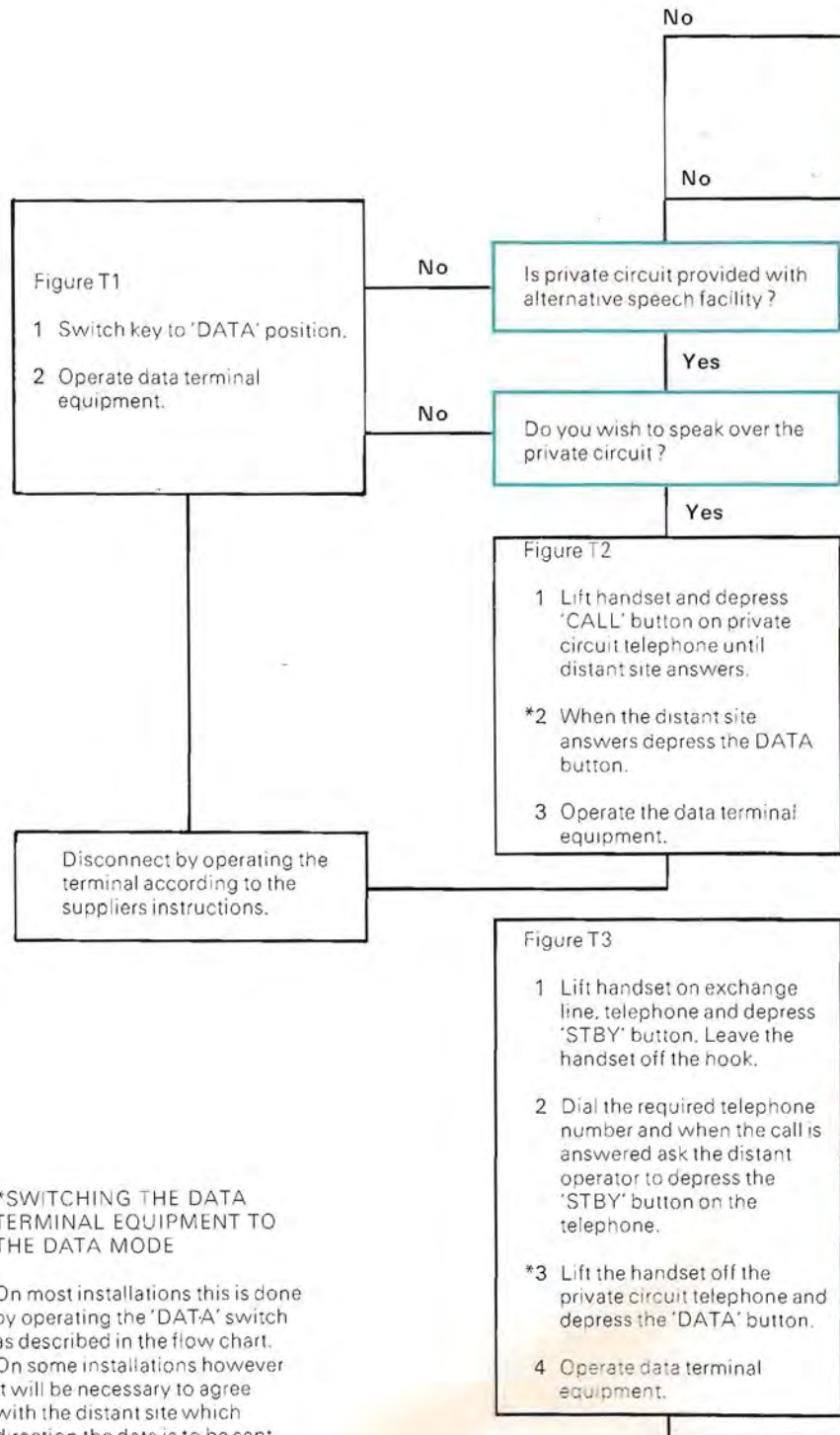
Fig T2 Private Circuit telephone showing typical position of 'CALL' button.



Fig T3 Telephone provided on installations consisting of a private circuit with speech facilities and a standby exchange line.

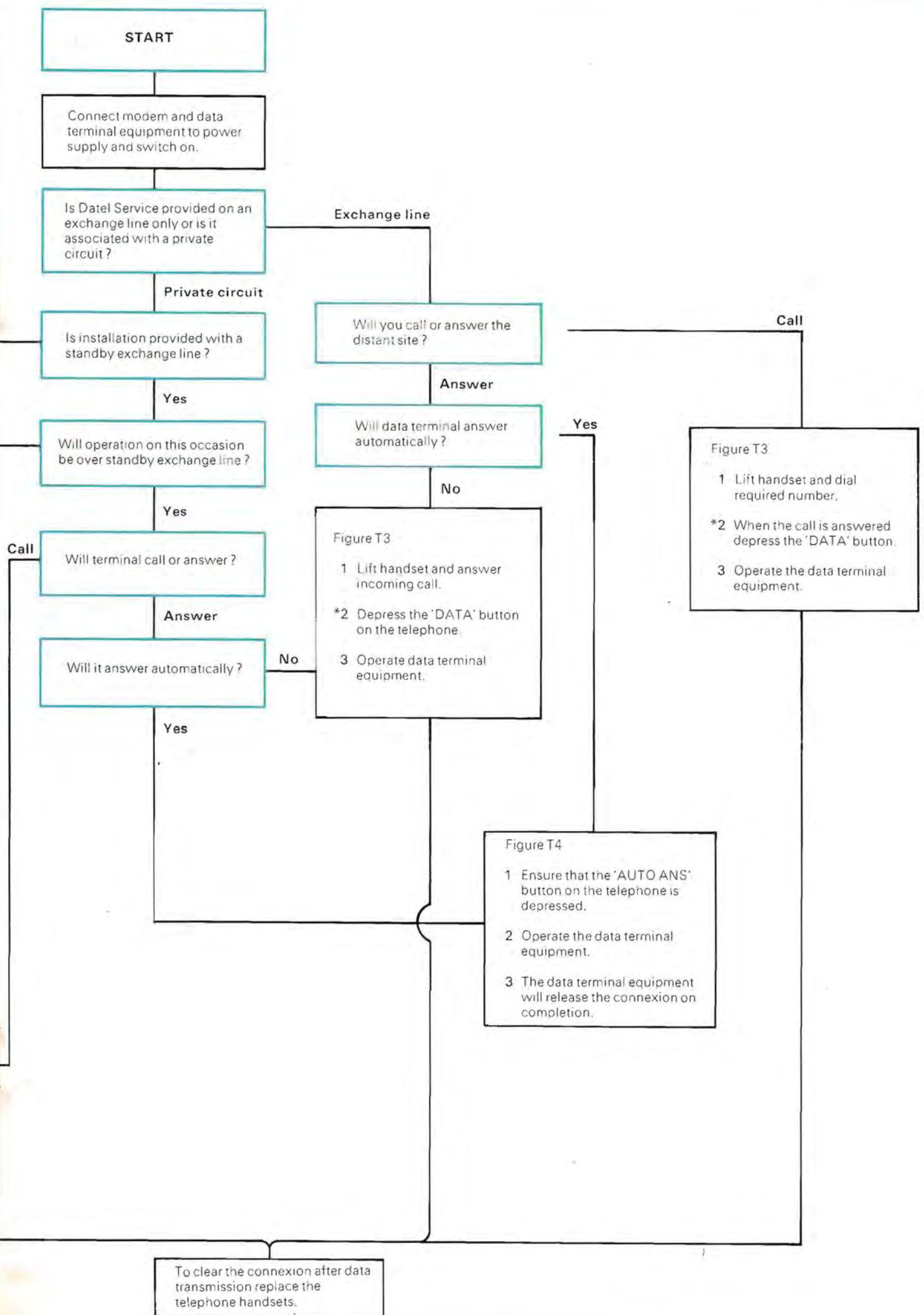


Fig T4 Exchange line telephone when not associated with a private circuit showing location of AUTO ANS button (when fitted).



## \*SWITCHING THE DATA TERMINAL EQUIPMENT TO THE DATA MODE

On most installations this is done by operating the 'DATA' switch as described in the flow chart. On some installations however it will be necessary to agree with the distant site which direction the data is to be sent and then to depress a 'SEND DATA' or 'REC DATA' button fitted on the telephone.



# 4 Testing procedures

When your data system fails in some way, service will normally be restored most rapidly when the failure is diagnosed correctly to either the Post Office provided or privately provided elements of the system.

Before any fault is reported to the Post Office, the elements of the system should be checked as far as possible to help identify in which suppliers' equipment a fault is suspected.

A number of testing facilities are available to aid the location of a fault on the Post Office provided equipment which are detailed below. It is important that the following procedures are carried out carefully to ensure that the tests give valid results.

## 4.1 Checking the Privately Provided Data Terminal Equipment (DTE)

- i. Ensure that the DTE is connected to the power supply, which is switched on and also that the DTE is itself switched on and appears to be working satisfactorily.
- ii. Check that the lead connecting the DTE and the Post Office modem is fully inserted into the rear of the modem.
- iii. Undertake any test procedures advised by the DTE supplier, which may include dialling a test number for a non-Post Office check on the operation of the DTE.

These checks should be carried out at the installations at each end of the circuit/connection.

## 4.2 Checking the Post Office Modems

- i. Ensure that the modems at each end of the circuit/connection are connected to their power supplies which are switched on and that the rotary test switch on the

front of each modem (Figure 2) is at Position 1 (NORMAL).

- ii. Where the system is associated with a private circuit, the Post Office line terminating unit should also be inspected to ensure that the test facilities are in the "normal" position when checked against the diagram in the leaflet which should be associated with this booklet.

## 4.3 Testing the Continuity of the Transmission Path – Speech Tests

- i. Where alternative speech facilities are available on a system provided with a private circuit, speech contact with the other end will establish the continuity of the circuit.
- ii. If alternative speech facilities have NOT been provided with a private circuit, but a standby exchange line is available, satisfactory speech over the standby exchange line may be used to indicate that the exchange line is in working order.
- iii. Satisfactory speech over an exchange line should indicate that the line is operational. However, should the first attempt to establish an exchange line connection prove unsatisfactory due to a noisy line making speech difficult, re-dialling the required number may provide a better connection for data transmission.

N.B. If you are unable to speak satisfactorily over a connection as described above, report the fault to the Post Office.

If telephone connections cannot be obtained which will support data transmission at 1200 bit/s, selection of the lower speed (600 bit/s) will normally give improved performance. In this case, the modems at both ends of the circuit must be re-set to the same speed of

working by the operation of the data terminal equipment.

TESTS 4.4, 4.5 AND 4.6 ARE OPTIONAL BUT CAN AID THE POST OFFICE IN RESTORING SERVICE.

These tests do not apply to installations using the Modem 1 (see Para. 2).

## 4.4 Testing for Data Signals over a Private Circuit – Modem to Modem Test

After the continuity of a private circuit for speech purposes has been proved successful, further "listening" tests can be made by each end of the transmission circuit to see if data signals are passing along the circuit and can be heard over the telephone.

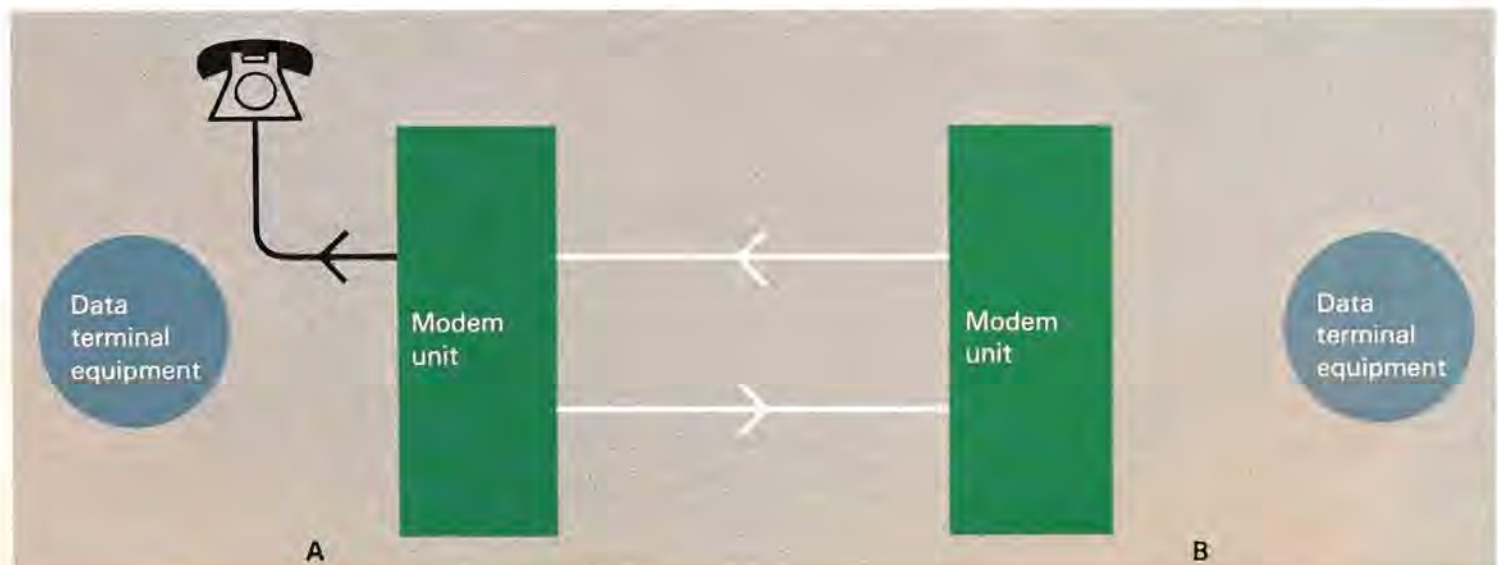
- i. One site must agree to remain in the speech mode ("A" end) and prepares to listen for data signals over the telephone (Figure 3).
- ii. At the other end of the circuit ("B" end), the DTE should be disconnected from the modem and the rotary test switch on the front of the modem should be operated (Figure 2), moving it slowly from Position 4 to 5 then 6.
- iii. At the "A" end, a different tone should be heard as the position of the test switch is altered from the "B" end.

After completing this test at one site, it may then be repeated from the other site.

If you fail to hear the tones at any of the three positions, the modem may be suspect and a fault report made to the Post Office.

N.B. When both tests are completed, the rotary test switch should be restored to Position 1 (NORMAL).

Figure 3 Modem to modem listening test



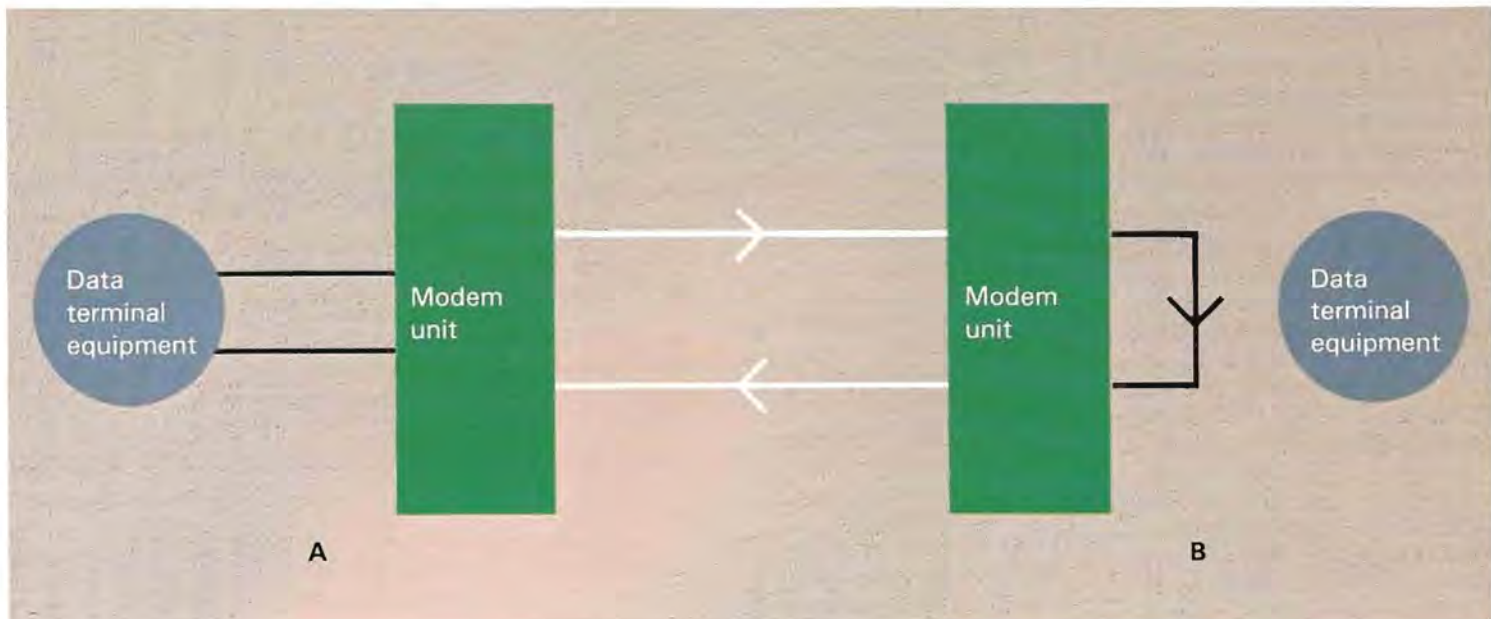


Figure 4 Remote test

#### 4.5 Private Circuit with Full Duplex Operation – Remote Test

This test is possible where transmission can take place in both directions simultaneously at a speed of 600 or 1200 bit/s and where the DTE has the ability to generate test data.

This test checks the entire Post Office provided data transmission path (as shown in Figure 4).

- i. Ensure that the power is switched on at the modems at both sites.
- ii. The DTE at the "B" end of the circuit must be disconnected from its associated modem.
- iii. Operate the rotary test switch on the front of the modem at the "B" end to Position 2 (REM TEST 1200) or Position 3 (REM TEST 600).

iv. Operate the DTE at the "A" end so as to send test data around the path set up. If the test routines received back appear satisfactory, a suspect DTE at the distant site ("B" end) may be indicated. However, if the test routines received are incorrect, a fault in the Post Office equipment may be suspected.

A similar test may then be repeated from the opposite direction in order to substantiate these findings.

#### 4.6 Private Circuit with a 75 Bit/s Backward or Supervisory Channel – Remote Test

This is a similar check to that described in 4.5 above (Figure 4). However, the check may only be carried out at a maximum speed of 75 bit/s, and is therefore not fully

representative of normal working and consequently is less valid as a test.

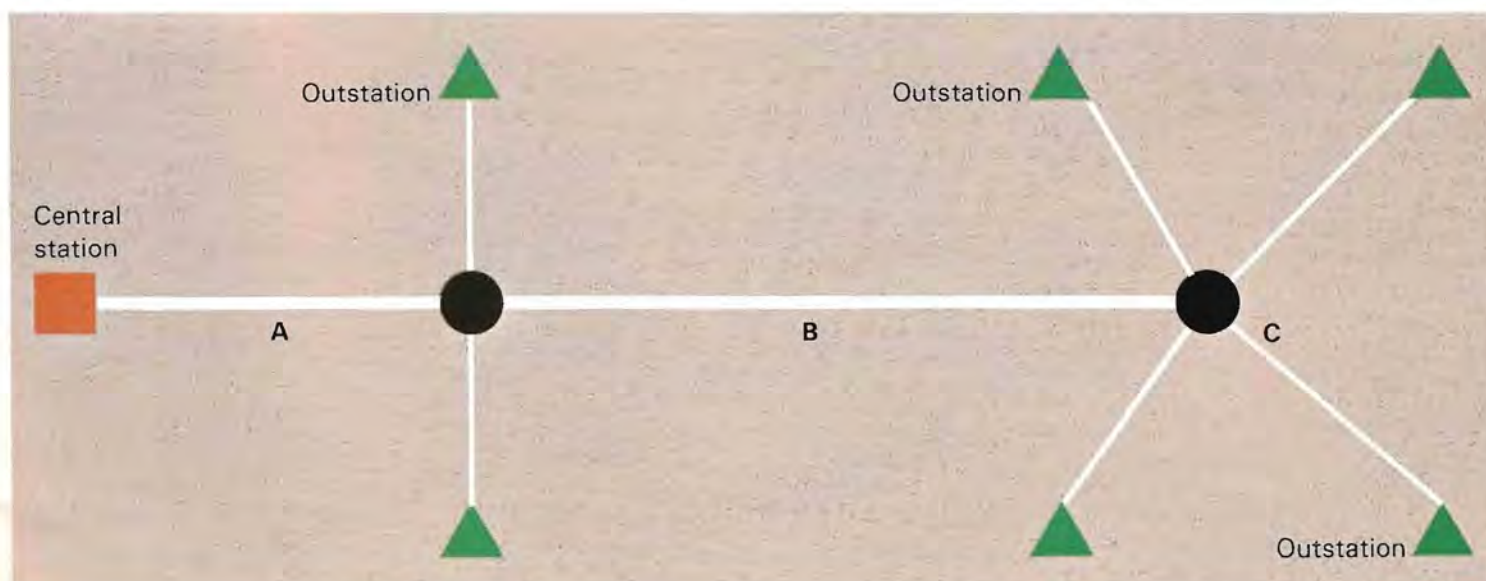
This test is carried out in the same way as described in Paragraph 4.5.

#### 4.7 Multipoint Circuits

A typical multipoint circuit is shown in Figure 5.

If service has been lost to all outstations, it is probable that either equipment at the central station has failed or that the common section (A in Figure 5) is faulty. If service has been lost to those outstations on an intermediate section of the circuit (B in Figure 5), it is probable that this section of the circuit is defective. If service has only been lost to one outstation, either the spur section of the circuit (C in Figure 5) or the equipment at that outstation may be expected to have failed.

Figure 5 Multipoint circuit



#### 4.7.1. Advice to Outstations when a Fault Develops

It is advised that the central station be contacted whenever a fault develops and before any testing of the equipment takes place as these tests may well affect the successful operation of the rest of the network.

Generally, testing procedures will be directed by the central station and will, probably involve removing the interface plug at the rear of the modem (and for the Modem 1 re-inserting a special yellow Post Office Test Plug in its place).

#### 4.7.2 Procedure at the Central Station – for applying a remote test to outstations (where the equipment at the Central Station has the ability to conduct test routines)

The central station will usually be the first element in a multipoint circuit to discover that a fault has occurred somewhere in the system. Outstations should contact the central station whenever a fault develops at their end, as any testing must be controlled by the central station, and the complete network may be closed

down during testing. In order to conduct a remote test (as shown in Figure 4) on an outstation the procedure outlined below should be followed by the central station.

- i For Outstations with a Datel 600 Service using the Modem 1.
  - a. The central station closes the complete line down by asking the outstation (to which the remote test is being conducted) to remove the interface plug from the rear of the modem and insert the yellow Post Office Test Plug in its place.
  - b. The central station should then switch their modem to line and send test "data" around the loop that has been set up.
  - c. The outstation should be asked to press the "REMOTE TEST" button (located at the rear of the modem below the interface socket) for the length of time indicated by the central station.
  - d. The central station should check the data received with that transmitted during the test for accuracy. If the test routines received are incorrect, a fault in

the Post Office equipment may be indicated.

After completing this test, the yellow PO Test Plug must be removed from the modem and the normal interface plug replaced, otherwise normal working of the multipoint circuit will be impaired.

- ii For Outstations with a Datel 600 Service using Modem 20.
  - a. The central station ensures that the power is switched on at the modems at both sites.
  - b. The outstation should then be asked to disconnect their DTE from its associated modem, and instructed to move the rotary test switch on the front of the modem to Position 2 (REM TEST 1200) or Position 3 (REM TEST 600), according to the data rate at which the test will be carried out.
  - c. The central station should then switch their modem to line and send test "data" around the loop that has been set up. If the test routines received back appear unsatisfactory, a fault in the Post Office equipment may be indicated.

## 5 Fault reporting

When a fault occurs and the checks outlined above indicate that the privately provided DTE is suspect, the fault reporting procedure laid down by your equipment supplier or data system provider should be followed.

Difficulties which cannot be attributed to the privately provided equipment should be reported to the Post Office as shown in Para. 5.1.

On making a fault report, co-operation with Post Office engineers may be required to enable the installation to be tested from a remote point. The testing engineer will then advise the action necessary. If a modem is associated with an exchange line connection, then testing will normally involve co-operation in unplugging the data terminal equipment and on request, either operating a test switch located on the front of the modem (Figure 2 – Modem 20) or at the rear of the modem (Modem 1).

Where a modem is associated with a private circuit which is thought to be at fault, co-operation with the PO engineers will generally involve the operation of the test facilities provided on the line terminating unit. For smaller installations the line terminating unit will be referred to

as either a Case 200 or Test Unit 14, both of which are generally located on the wall close to the Post Office equipment they serve. A leaflet describing the unit used with your installation should be associated with these instructions and will describe their operation.

Any further action which is necessary will be advised by the PO engineer.

### 5.1 Fault Reporting Procedure

Where it seems likely that the fault on your installation is not due to equipment provided by other suppliers, then speedy attention will be given to the Post Office equipment only if the correct fault reporting procedure is followed.

Privately owned equipment fault reporting points :

Local end.....

Distant end.....

Post Office fault reporting points :

.....  
(between 8.30 am–5.30 pm Mon-Fri)

.....  
(at other times and Bank Holidays)

On reporting a fault to the Post Office, please be prepared to give the following information :

i. State that your Datel 600 Service is at fault, quoting the exchange line number/private circuit reference number shown on the dial centre label (whichever applies) for the affected circuit used for data transmission.

Exchange line Telephone No.

.....  
Private Circuit No.

ii. Give the name and telephone number of the person in your organisation who should be contacted by the Post Office in connection with your fault report and who will be contacted when the fault has been cleared.

iii. Indicate as far as possible, the nature of your fault. Your co-operation with Post Office engineers may be required later, in order to conduct tests on your system from a remote point. In this case, the engineers will advise you of the necessary action.

## 6 Customer Service

Should you need to raise any general service matters about your Datel system, you should contact your local Data

Customer Service Officer during normal office hours.

The Telephone No. is.....

(A list of Data Customer Service Officers appears at Appendix 1 to this booklet.)

# Appendix 1 Data Customer Service Offices

**Aberdeen**

Aberdeen (0224) 25246

**Bedford**

Bedford (0234) 57070

**Belfast**

Belfast (0232) 46146

**Birmingham**

021-262 2888

**Blackburn**

Blackburn (0254) 666343

**Bournemouth**

Bournemouth (0202) 25590

**Bradford**

Bradford (0274) 20342

**Brighton**

Brighton (0273) 25959

**Bristol**

Bristol (0272) 296404

**Cambridge**

Cambridge (0223) 64646

**Canterbury**

Canterbury (0227) 64204

**Cardiff**

Cardiff (0222) 29590

**Carlisle**

Carlisle (0228) 29447

**Chester**

Chester (0244) 46006

**Colchester**

Colchester (0206) 63939

**Coventry**

Coventry (0203) 23135

**Dundee**

Dundee (0382) 302468

**Edinburgh**

031-345 4141

**Exeter**

Exeter (0392) 54148

**Glasgow**

041-221 2584

**Gloucester**

Gloucester (0452) 24848

**Guildford**

Guildford (0483) 60598

**Lancaster**

Lancaster (0524) 88438

**Leeds**

Leeds (0532) 465463

**Leicester**

Leicester (0533) 534354

**Lincoln**

Lincoln (0522) 25532

**Liverpool**

051-229 3748

**LONDON****Centre**

01-437 8060 Extn 409

**City**

01-921 9206

**East**

01-553 7044

**North**

01-340 8060 Extn 333

**North Central**

01-829 4410

**North West**

01-452 8060 Extn 357

**South**

01-760 7001

**South Central**

01-261 4364

**South East**

01-290 2431

**South West**

01-879 2060

**West**

01-579 8424

**MANCHESTER****Central**

061-863 6333

**North**

061-863 8443

**South**

061-863 5504

**Middlesbrough**

Middlesbrough (0642) 248474

**Newcastle-upon-Tyne**

Newcastle-upon-Tyne  
(0632) 613292

**Norwich**

Norwich (0603) 26891

**Nottingham**

Nottingham (0602) 55944

**Oxford**

Oxford (0865) 812383

**Peterborough**

Peterborough (0733) 66628

**Plymouth**

Plymouth (0752) 62666

**Portsmouth**

Portsmouth (0705) 813555

**Preston**

Preston (0772) 54222

**Reading**

Reading (0734) 53833

**Scotland West**

041-242 2079

**Sheffield**

Sheffield (0742) 732702

**Shrewsbury**

Shrewsbury (0743) 62068

**Southampton**

Southampton (0703) 82 3388

**Southend**

Southend (0702) 47667

**Stoke-on-Trent**

Stoke-on-Trent (0782) 28132

**Swansea**

Swansea (0792) 55707

**Taunton**

Taunton (0823) 2284

**Tunbridge Wells**

Tunbridge Wells (0892) 30845

**West Midland**

021-262 2639

**York**

York (0904) 57366



Datel 2412 Service

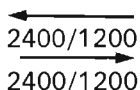
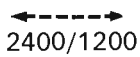
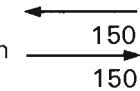
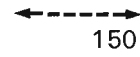


## Description

The Datel 2412 Service enables data to be transmitted synchronously at 2400 bits per second (bit/s). As both private circuits and the public switched telephone network (PSTN) can be used maximum advantage can be obtained from the flexibility of the system. The hardware for the Service is provided by a modulator/demodulator unit (modem unit) and a line switching unit. The modem unit translates information received from Data Terminal Equipment into signals that are suitable for transmission over telephone circuits; the line switching unit provides the means of associating the modem with either private circuits and/or exchange lines, it also supplies a power source for the modem unit. The modem has been specially designed to meet the needs of both single and multiple installations. For 'table top' situations the modem is housed in a low profile case and a flip down front cover gives easy access to controls. For multiple installations the modules of the modem can be readily installed in a standard Post Office Control System offering economic use of floor space.

The Service is available with either 4-wire private circuits, which enable data to be transmitted in a duplex mode or with the PSTN which is used for half duplex transmissions. The 4-wire private circuits can be part of a network consisting of either point to point or multipoint circuits and can have PSTN standby facilities.

## Combination of facility options

	Code 31	Code 32	Code 41	Code 42	Code 51	Code 52	Code 53
2400/1200 on private circuit both ways simultaneously 	●	●	●	●			
2400/1200 on PSTN both ways not simultaneously 			●	●	●	●	●
Unattended answering on PSTN			●	●	●	●	●
150 on private circuit backward channel both ways simultaneously 	●		●				
150 on PSTN backward channel both ways not simultaneously 			●		●		
Automatic calling							●

Other features and options of the Service include –

Fallback speed of 1200 bit/s available on both private circuit and PSTN operation.

Automatic answering on PSTN conforming to CCITT recommendation V.25.

Test facilities to assist in fault diagnostic routines.

150 bit/s asynchronous supervisory or backward channel.

Alternate speech and signalling facilities on the private circuit.

Conforms to CCITT V.26 and V.26 bis recommendations.

Variable 'ready for sending' delay periods to meet Inland and International standards.

Maintenance charges are included in the tariff and apply nationally.

The modem is fitted with a standard 25 way D type socket which provides the interface between the modem and those terminals which have been cleared by the Post Office for connection to the Datel 2412 service.

## How it operates

Before data transmission can take place it is necessary to connect the modem to line, there are three standard methods of achieving this connection.

- a By push buttons on the telephone(s)
- b By control from the Data Terminal Equipment
- c By a combination of the previous two methods

The Post Office has evolved a switching method that is designed to meet the requirements of most terminal operating systems. Its advantages include –

Control of transmission system at 2400 bit/s exclusively on telephones.

Standby switching from private circuit to PSTN controlled from telephones.

Handsets are independent of data control buttons.

Status lamps on telephones to indicate modem connected to private circuit or PSTN.

For private circuit operation the modem is directly connected to line as soon as the power is switched on; where the PSTN is used a satisfactory speech connection is initially established and then the modem is switched to line. When connection has been established the system will be operational.

### Notes:

- 1 Where both private circuit and PSTN use is required a combination of two switching methods may be employed.
- 2 Terminal equipment suppliers will advise on the method of connection most suitable for their equipment.
- 3 The Post Office will supply an Operating Handbook with each installation which will detail call set up and call termination procedures.

Key to options

**Private circuit 4-wire**   
**Public Switched Telephone Network**   
 Speed in bits per second  
 2400  
 1200  
 150

Automatic calling facility requires the provision of additional equipment

## Facilities

The Datel 2412 Service has been designed to provide a range of facilities to meet system requirements on both private circuit and PSTN operation. The options chart details the combinations that are available with this Service; the two digit numbers relate to specific facilities.

It is recommended that exchange lines are rented with private circuit systems so that, in the event of private circuit failure, standby procedures may be implemented in order that the system remains operational. When using the PSTN a transmission rate of 1200 bit/s on all connections should be achieved, 2400 bit/s will be possible on the majority of calls attempted. The exchange line can also be used to provide remote test access to the modem from the Post Office Datel Test Centre to assist in fault diagnostic procedures. To help in the localisation of faults a number of test functions have been built into the modem. On a 4-wire private circuit local, remote and end to end tests can be performed. The PSTN can be tested in local and end to end conditions.

The 150 bit/s asynchronous supervisory or backward channel is optional; if required, it can be used on both private circuits and the PSTN.

**Important:** The transmission system employed in the Datel 2412 Service complies with the latest CCITT recommendation; it is *not* compatible with either the Datel 2400 Service or the Datel 2400 Dial Up Service.

## Technical information

### Dimensions and weights

Modem unit (maximum size)  
Width 300mm (12")  
Length 440mm (17½")  
Height 100mm (4")  
Weight 8.7kg (19¼lb)

Line switching unit  
Width 225mm (9")  
Length 400mm (15¾")  
Height 75mm (3")  
Weight 5.9kg (13lb)

### Environmental conditions

Ambient temperature range +5°C to +45°C.  
Relative humidity range from 40% to 90%.

### Power

240 volts AC ±6%, 50Hz single phase ±10%.  
Power consumption 26 watts maximum.

### Modulation method

Main mode: 4 phase differential modulation (CCITT V26 type B and V26 bis recommendations)  
Fallback mode: 2 phase differential modulation (CCITT V26 bis recommendation)  
Backward Channel: Frequency Shift Keying up to 150 bit/s

### Data signalling rate

Main mode: 2400 bit/s synchronous  
Fallback mode: 1200 bit/s synchronous  
Backward Channel: 150 bit/s asynchronous

### Transmission path

– 4-wire private circuit only  
– PSTN only  
– 4-wire private circuit with PSTN standby

### Method of operation

4-wire private circuit – duplex and half duplex  
PSTN – half duplex  
Note: Asymmetric duplex is available on the PSTN with the backward channel.

### 'Ready for Sending' Delays

– 4-wire private circuits – 12 ms  
– (point to point and multipoint)  
– PSTN (within UK) – 80 ms  
– PSTN (International) – 235 ms

### Equalisation

Equalisation is provided when necessary by means of a compromise equaliser (this type does not require any manual adjustment). The equaliser has been designed specifically to meet the average line conditions that can be expected on the United Kingdom telephone network.

### Interface connection

Connection of Data Terminal Equipment to the modem is effected by means of a 25 pin D type connector. The specification for the connector is available on request.

### Interface circuits

All circuits conform to CCITT V24 and V28 recommendations.

### Test facilities

To assist in first line diagnostic procedures the modem contains a number of test functions. These are controlled from switches and lamps behind the front cover of the modem.

Functions – 4-wire private circuit – local loop, remote loop and end to end tests.

PSTN – local loop and end to end tests.

When the modem is associated with the PSTN remote tests can be carried out from a Datel Test Centre by experienced Post Office maintenance staff.

### General

The tariff for the modem, which consists of a connection charge and annual rental includes all normal maintenance charges. Maintenance support for Datel Services is, generally, available anywhere within the United Kingdom both during and outside normal business hours.



## Datel Sales Enquiry Points: Telephone Numbers

### **Aberdeen**

Aberdeen (0224) 24009

### **Bedford**

Bedford (0234) 52241

### **Belfast**

Belfast (0232) 33576

### **Birmingham**

021-262 2757

### **Blackburn**

Blackburn (0254) 666387

### **Bournemouth**

Bournemouth (0202) 24990

### **Bradford**

Bradford (0274) 20974

### **Brighton**

Brighton (0273) 202090

### **Bristol**

Bristol (0272) 296507

### **Cambridge**

Cambridge (0223) 61816

### **Canterbury**

Canterbury (0227) 60034

### **Cardiff**

Cardiff (0222) 24749

### **Chester**

Chester (0244) 20192

### **Colchester**

Colchester (0206) 41331

### **Coventry**

Coventry (0203) 22905

### **Dundee**

Dundee (0382) 302201

### **Edinburgh**

031-345 4480

### **Exeter**

Exeter (0392) 75030

### **Glasgow**

041-220 2899

### **Gloucester**

Gloucester (0452) 25451

### **Guildford**

Aldershot (0252) 27546

### **International**

01-432 5407

### **Lancaster**

Lancaster (0524) 88207

### **Leeds**

Leeds (0532) 37893

### **Leicester**

Leicester (0533) 534111

### **Lincoln**

Lincoln (0522) 26651

### **Liverpool**

051-229 3961

### **LONDON**

#### **Centre**

01-437 8060 Ext 352

#### **City**

01-921 8754

#### **East**

01-553 7228

#### **North**

01-340 8060 Ext 7143

#### **North Central**

01-829 4405

#### **North West**

01-864 4347

#### **South**

01-760 7400

#### **South Central**

01-261 4622

#### **South East**

01-290 2494

#### **South West**

01-879 2444

#### **West**

01-579 8771

### **MANCHESTER**

#### **Central**

061-863 6438

#### **North**

061-863 8261

#### **South**

061-863 5478

#### **Middlesbrough**

Middlesbrough (0642) 248636

### **Newcastle upon Tyne**

Newcastle (0632) 613364

### **Norwich**

Norwich (0603) 25282

### **Northampton**

Northampton (0604) 39171

### **Nottingham**

Nottingham (0602) 56869

### **Oxford**

Oxford (0865) 812312

### **Peterborough**

Peterborough (0733) 69664

### **Plymouth**

Truro (0872) 4224 Ext 230

### **Portsmouth**

Portsmouth (0705) 813411

### **Preston**

Preston (0772) 55989

### **Reading**

Reading (0734) 52598

### **Scotland West**

041-242 2068

### **Sheffield**

Sheffield (0742) 732377

### **Shrewsbury**

Shrewsbury (0743) 3388

### **Southampton**

Southampton (0703) 33270

### **Southend**

Southend (0702) 47099

### **Stoke-on-Trent**

Stoke (0782) 28296

### **Swansea**

Swansea (0792) 52870

### **Taunton**

Taunton (0823) 87172

### **Tunbridge Wells**

Tunbridge Wells (0892) 24511

### **West Midland**

021-262 2609

### **York**

York (0904) 57220

Your local Sales Office will be pleased to give you the Postal address of any of our area offices.

#### **Please note**

We do our best to supply our customers with the apparatus they ask for but we may have to provide apparatus which does not accord exactly with the descriptions and illustrations in this leaflet.

**For further or up-to-date information please contact the special services representative of your Local Telephone Sales Office. The telephone number is shown above.**

If you have difficulty obtaining information from the numbers listed please call Freephone 2170 or 01-432 1813

## Datel Services Dataplex 2

Data can be transmitted simultaneously from a number of remote terminals to a Computer Centre at reduced cost using the Dataplex service.



## Introduction

Dataplex is a PO multiplexing service comprising multiplexors, lines and modems in one package. The service offers data transmission users reduced costs by sharing one private circuit among several remote terminals requiring to communicate simultaneously with the same computer centre. The technique used for Dataplex 2 is character-interleaved Time Division Multiplexing (TDM).

## General Facilities

The Dataplex 2 service incorporates a bearer circuit with a high speed modem and a multiplexor at each end.

The remote end of the Dataplex system is normally sited in a PO telephone exchange (see diagram), but may be in a customer's premises. Access to the Dataplex equipment is gained via Datel services on either the Public Switched Telephone Network or private speech/telegraph circuits, or on a mixture of any.

## Circuit Capacities

The data transfer rate on the main bearer circuit can be either 2400 bit/s or 4800 bit/s, depending on the high speed modem provided. Data transfer rates of 50, 75, 110, 134.5, 200, 300, 600 and 1200 bit/s can be multiplexed through the Dataplex equipment, subject to the capacity of the main bearer circuit. Different rates can be intermixed; for example, a 4800 bit/s Dataplex 2 can accommodate:

2 derived circuits at 600 bit/s  
plus 4 derived circuits at 300 bit/s  
plus 6 derived circuits at 134.5 bit/s  
plus 11 derived circuits at 110 bit/s.

## Features

A customer network can be expanded from a basic unit equipped for up to 16 circuits to a nationwide network comprising several integrated systems. Expansion is achieved by means of plug-in modules; thus customers are provided with equipment suited to their particular needs.

The Dataplex 2 modules are:

### Basic Unit

This is the multiplexor itself with processor, power unit, system test module and a high speed transmission system.

### Circuit Shelves

Either 16- or 32-circuit shelves can be added to the basic unit as required, up to a maximum of 64 circuits.

### Circuit Cards

included in the circuit shelf as required.

### Remote Circuit Busy

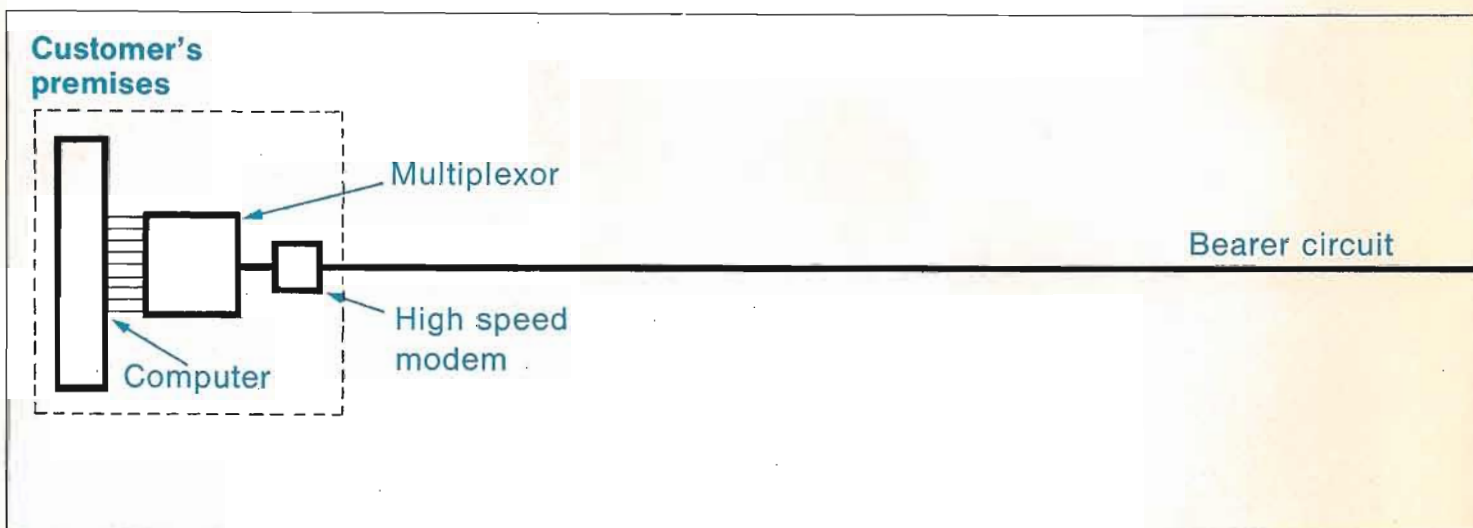
enabling busying of circuits at remote nodes to be controlled from the controlling node multiplexor – an optional extra specified for each circuit provided.

### High Speed Modems

There is a choice of 2400 bit/s or 4800 bit/s modems for the main bearer.

### Automatic Bit Rate and Code Selection (ABR)

The installation of an ABR module at a remote node provides for the automatic selection of pre-determined data rates and code levels on selected circuits.



### Diagnostics

Fault diagnostics are available on the multiplexors, enabling customers to carry out certain tests.

Networks can be arranged to include:

### Hubbing

A facility whereby the controlling node multiplexor can support up to six remote multiplexors by means of additional high speed transmission systems.

### Through Circuits

Permitting an intermediate multiplexor in a Dataplex network to pass data through without demultiplexing.

### Synchronous Intermix

Enabling a single 2400 bit/s synchronous transmission to share a bearer circuit of 4800 bit/s capacity with low speed asynchronous data.

### Costs

Dataplex 2 is available on annual rental terms with a one year term of agreement. Each module of the service has a separate rental, charges relating directly to the facilities provided.

### Availability

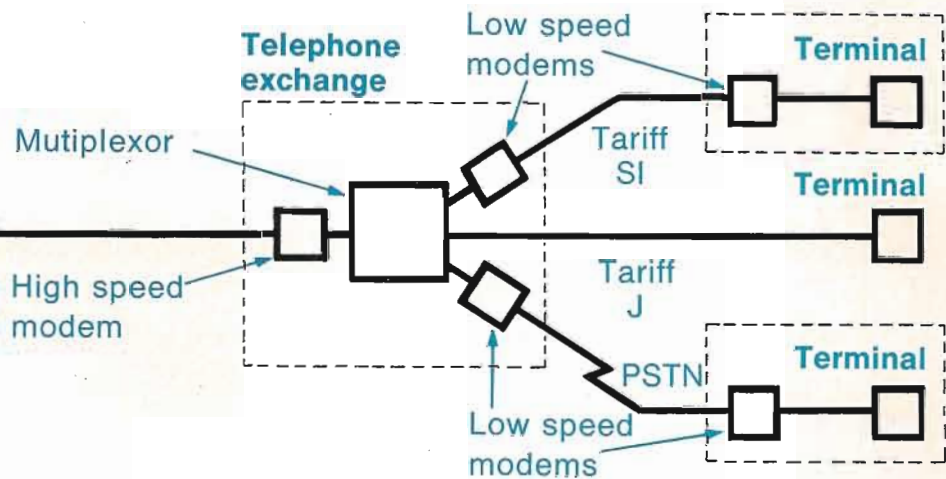
Dataplex 2 is available now. Provisioning periods will depend upon the precise facilities required.

### Accommodation

Dimensions and weights of the racking used to house the Dataplex equipment are as follows:

Height 1650mm  
Width 545mm  
Depth 545mm

The maximum distribution loading is 5.6 kPa (kilopascals) which is approx 547 kg per square metre.



### Enquiries

For more information, ring or write to the special services section of your local Telephone Sales Office. The address and telephone number are shown in the preface of your Telephone Directory.

### Notice to Customers

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