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| Interconnect |
| **GUIDE** |
| Operational Testing Manual |
|  |
| Issue 6.0 |
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**1 Document Information**

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**1.2 Legal Notice**

British Telecommunications PLC “BT” provides a copy of this Operational Testing Manual “OTM” to UK Communications Network Providers “CPs” for their own use subject to the following conditions:

* That any revision has all references to BT removed (unless BT gives its prior written consent to the contrary);
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**1.3 Contractual Significance Statement**

This document does not form part of any contract between BT and the CP.

However, some parts of this document may, where a ‘[Standard Interconnect Agreement](https://www.btwholesale.com/pages/static/Pricing_and_Contracts/Reference_Offers/Telephony.html)’ exists between BT and the CP, repeat certain legally binding provisions of that interconnect agreement. If that is the case, the fact that this document is not itself legally binding shall not affect any of the rights and obligations of BT or the CP under the interconnect agreement.

BT and the CP will endeavour to confirm that the information contained in this document is correct to the best of their knowledge. However, neither party warrants that such information will be free from errors.

**1.4 Issue Control**

This document is issued and maintained by the BT Operate and is controlled in accordance with BT Quality Management System Procedures.

The issue number of the document will be identified by the ‘Issue’ on the front page.

The issue date of the document will be identified by the top entry in the table in sub-section 1.5.

The current version of this document can be located [here](https://www.btwholesale.com/pages/static/Library/Technical_Documents_and_Procedures/Interconnect_Testing_Manual/index.htm).

**This manual becomes uncontrolled when printed or after being downloaded.**

**1.5 Document History**

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| **Issue** | **Date** | **Summary of Changes** |
| 6.0 | 31/07/12 | Change of ownership to BT Operate - see 1.6 for other changes |
| 5.0 | 31/10/07 | Working Document. No changes to draft |
| 31/03/07 | Draft C | Change to testing time scales |
| 31/07/06 | Draft B | Added Waiver Form |
| 30/11/05 | Draft A | 1. Add sub-section regarding CPs Test Requirements
2. Incorporate Revised Test Case Decision Flow Chart
 |
| 4.0 | 28/02/05 | Working Document. See section 1.6 for changes to Draft A | * Remove Redundant Sections, re-order remainder
* Incorporate ‘Test Case 2b’ within this document
* Add an OTM Review Process
* Add ‘Post Test Revisit’ Process
 |
| 30/09/04 | Draft A (External) |
| 31/07/04 | Draft A (Internal) |
| 3.0 | 30/07/03 | To:1. remove redundant content;
2. revise test case names;
3. revise test case definitions;
4. define testing time scales;
5. revise test case decision flow chart
 |
| 2.2 | 30/05/01 | Issued to confirm validity & amend contact details only |
| 2.1 | 15/06/00 | Reflecting up issue of other OTMs only |
| 2.0 | 30/05/00 | Reflecting up issue of other OTMs only |
| 1.1 | 14/10/98 | Minor Amendments for industry trial & web publish |
| 1.0 | 10/09/98 | Initial Issue |

**1.6 Summary of Changes to Last Issue**

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| --- |
| **Section 1** |
| Reflecting changes to other sections only |

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| --- |
| **Section 2**  |
| Simplified criteria for Test Case 2b defined and Waiver section removed (Moved to Provisioning Manual Appendix 34) |

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| **Section 3** |
| None |

**1.7 Review Procedure**

The document will be reviewed biennially by the author.

Should amendments or additions be required, the proposed changes will be communicated to industry via interconnect notification and/or briefing via the Standard Contract Forum as appropriate.

Comments or proposed amendments to this document should be forwarded to the Author.

**1.8 Author**

The author of this document can be contacted for enquiries or comment via e-mail by clicking here.

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**2 Testing**

**2.1 Introduction**

This document, the Guide Operational Testing Manual (OTM), gives information about test booking and provides supporting information which enables the other OTMs to be used effectively. It does not contain any tests but supports the other testing manuals.

**2.2 Purpose of Testing Manuals**

The Operational Test Manuals detail a series of tests which are designed to verify the physical, electrical and functional interface between the BT Network and a CP Switch where SS7 signalling is employed. The tests are based on agreed methods of interworking as specified in the commercial and technical agreements between the two parties.

These tests are required to verify that the two networks interwork in a satisfactory and compatible way without affecting any of the existing services and that in particular an acceptable quality of service is provided to end customers.

**2.3 Site Attendance**

Test Cases 1a and 1b:

BT Interconnect Testing Officers (ITOs) will physically attend the BT site unless it has been agreed that BT will perform testing at the CPs site.

Test Case 3:

Unless a bi-lateral agreement exists (either generally or in relation to a specific order), it is the responsibility of the company which placed the capacity order to ensure their availability to attend their own site in order to perform the tests which require physical access to equipment.

Other Test Cases:

Site attendance not required by either party.

**2.4 Test Results**

It is the responsibility of both BT and the CP to ensure that proper test results (using OTM results sheets) and/or or call traces are generated and retained for all tests by each party for their own records.

BT will not generally share testing results with the CP’s testing representatives, but may choose to do so on a limited basis either to aid in resolving issues which may arise, or if BT is testing at the CP site we will share testing results with the CP’s representative.

**2.5 Test Booking and Methodology**

Introduction

This section provides an overview of the criteria used to determine what testing is appropriate for a new route and how to perform the testing.

New Route Test Booking

The basic procedure to determine test requirements for a new route is as follows:

A. *Determine whether this route is the first connection to the CP switch*

If yes the test case level will be 1 otherwise it will be 2 (skip to part C),

B. *Determine whether the CP switch is of a known or unknown build\*.*

Unknown Build = Test Case 1a

Known Build = Test Case 1b

\* More information on whether builds are known or unknown can be found by reading Section 4.3 (or 5.3) of the Interconnect Provisioning Manual, ‘Testing Requirements’. This document can be located by clicking [here](https://www.btwholesale.com/pages/static/Library/Technical_Documents_and_Procedures/Interconnect_Provisioning_Manual/index.htm).

C *If the Test Level is 2, agree specific type*

Default Subsequent Route Level = Test Case 2a

Bi-Laterally Agreed Subsequent Route Level = Test Case 2b

The testing level will be agreed at time of scheduling, provided the BT IRO has agreed that the switch combination may be tested at that level.

D. *Determine which Service Types are to be used on the route*

The specific combination of Services will depend on the CPs requirements.

More information about service types can be found by reading Section 2.6.

E. Agree the testing Requirements and Duration

Once the testing level has been identified and the service types agreed, use Section 2.9 to determine the likely duration of the testing (test window).

Once the test window is agreed, preparations should proceed to ensure that all the pre-requisites are in place to enable the testing to start and then proceed on time.

In order to determine the testing level for other scenarios, e.g. new service on an existing route, please refer to the Test Case Decision Flow Chart in Section 2.8.

Test Methodology

The tests which need to be performed are contained in the Core and Services OTMs.

The Core OTM contains Electrical Interface, MTP Level 2, Data and Miscellaneous tests which are required whether the route under test uses IUP or UK-ISUP signalling (or both).

The services OTMs contain the tests relating to the service type to be tested and the relevant services OTM will need to be chosen depending on the signalling type(s) to be used on the route. If UK-ISUP and IUP are both present on the route, each protocol will have to be fully tested.

A. *Determine the Appropriate Tests to Perform*

Use Section 2.3 of the Core and relevant IUP/UK-ISUP Services OTMs to determine the appropriate tests to perform for each Service Type at the required level of testing.

B. *Perform the Tests*

Perform the tests as detailed in Test Procedures within the OTMs jointly with the other CPs testing team.

Test results sheets (or alternatively electronically generated call traces) should be retained locally in line with normal document retention guidance.

C. *Success Criteria*

Confirm that the results comply with Test Results / Reference Messages within the OTMs.

Where any test does not produce acceptable responses, the reasons should be investigated, a remedy attempted and the test repeated. The number of times the test is repeated and reasons why should be recorded.

If the above process does not produce acceptable responses testing officers should follow appropriate escalation procedures to support groups e.g. BTs ITS.

D. *Testing Issues*

If the issues cannot be rectified during the testing window (using appropriate support functions and or escalations where appropriate), then either the testing will need to be re-booked, or a waiver may need to be issued (see [Provisioning Manual](https://www.btwholesale.com/pages/static/Library/Technical_Documents_and_Procedures/Interconnect_Provisioning_Manual/index.htm) Section 4 or 5, sub-section 4.3.9 / 5.3.9.

E. In Service

When all tests are completed and issues resolved the capacity may be brought into service.

**2.6 Service Type Definitions**

The following is a definition of the Service Types which will be considered for testing.

|  |
| --- |
| **Basic Telephony (01x, 02x, 07x)** |
| Directly dialled call from the CPE of one CP to the CPE of another CP. Is either CP to BT or BT to CP. |
| **Emergency Assistance (999/112)** |
| Call from the CP Network via the agreed BT switch suffixed with the CP’s II Digits (and Zone code for mobile CP’s) and passed on to a BT emergency call handling centre. |
| **Operator Assistance (100/155/195)** |
| Call from the CP’s Network via the agreed BT switch, suffixed with the CP’s II digits and passed on to the relevant BT call handling centre for access to National (100), International (155) or Blind & Disabled (195) Operator Assistance. |
| **Directory Enquiries (118xxx)** |
| Directly dialled call from the CPE of one CP to another CP’s Directory Enquiries Service. Is either CP to BT or BT to CP. |
| **Number Translation Service – NTS (08x, 050x, 09x)** |
| Directly dialled call from the CPE of one CP to another CP’s number translation service. Is either CP to BT or BT to CP. Includes Premium Rate type calls.  |
| **Personal Number / Assistant Service – PNS/PAS (0700x)** |
| The BT end-user dials the number allocated to the CP’s PN/PA Service. The call is carried within the BT network to a nominated BT switch and is then passed to the CP for re-direction to the either the nominated (in the case of PN) customer number or all (in the case of PA) of the customer’s numbers. |
| **Indirect Access – IA** |
| The BT end-user registered with another CP dials an access code to allow them uncharged (by BT) access to that CP’s network. After dialling the access code the call is carried within the BT network to a nominated BT switch and handed over to the CP. At this point BT hands over control of the call set up to the CP. |
| Single Stage Access (IA1) –Call set-up digits are handed over in one stage, with customer validation being determined using CLI validation. |
| Two Stage Access (IA2) – Call set-up digits are handed over in two stages, with an intermediate customer validation using authorisation code. CLI validation may also occur. |

**2.6 Service Type Definitions (Contd)**

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| **Carrier Pre-Select – CPS**  |
| The BT end-user nominates the call types to be handled by a particular CP, and when a dial pattern matching the call types is intercepted at the BT local switch, the appropriate CP’s 4 digit prefix is inserted, from which point the call behaves as per IA1. |
| **Dial IP**  |
| The BT end-user’s modem dials the full non-geographic number or Single Stage IA code to gain access to the CP’s IP network. |
| **Paging** |
| The BT end-user directly dials the number allocated to the CP’s Paging Service, either directly or via a paging call handling centre (IUP only). |
| **Voice Messaging** |
| The BT end-user chooses to take a voice messaging service from another CP (IUP only). |

**2.7 Test Case Definitions**

The following table defines the test case definitions used in test scheduling and in the OTMs.

|  |  |
| --- | --- |
| **Test Case** | **Definition** |
| **1** | **a** | First traffic route between the BT network and an CP switch with an unknown build [using new signalling, direct or STP] |
| **b** | First traffic route between the BT network and an CP switch with a known build [using new signalling, direct or STP] |
| **2** | **a** | All subsequent new traffic routes after either a Test Case 1a or 1b has been completed [using new direct or existing STP signalling] | see sub-section 2.10 |
| **b** | Alternative for all subsequent new traffic routes [using new direct or existing STP signalling] - in lieu of Test Case 2a |
| **3** | Route Expansion (additional E1s on existing route) |
| **4** | **a** | Additional service type on first existing route where the CPs switch has an unknown build (for that service type) |
| **b** | Additional service type on first existing route where the CPs switch has a known build (for that service type) |
| **c** | Additional service type on all subsequent existing routes {may be waived with agreement of BT & CP if routes are already in service} |
| **5** | Additional Signalling Links |

**2.8 Test Case Decision Flow Chart**

The Test Case Decision Flow Chart is used to determine the appropriate Test Case(s) for the new route and/or Service Type under test:



The Test Case Decision Flow Chart can be seen as a Microsoft™ Powerpoint™ Slide Show by double clicking on the attached document:



**2.9 Test Case Time Scales**

The following table is used to determine the durations of test windows:

|  |
| --- |
| **Test Case Time Scales** |
| **Test****Case** | **Inclusions & Exceptions** | **Working Days** |
| 1 | a | Signalling links and associated\* E1s (remainder as TC3) and first Service Type (remainder as TC4a)  | 4 |
| b | Signalling links and associated\* E1s (remainder as TC3) and first Service Type (remainder as TC4b)  | 2 |
| 2 | a | Signalling links and associated\* E1s (remainder as TC3) and first Service Type (remainder as TC4c)  | 1 |
| b | Signalling links and associated\* E1s (remainder as TC3) and firstService Type (remainder as TC4c) | ½  |
| 3 | Up to 15 E1s (for the same customer) | ½ |
| 4 | a | Per Service type | 1 |
| b | Per Service type | ½ |
| c | Per service type | ½ |
| 5 | Up to two additional links in an existing link set | ½ |

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| **Definitions & Notes** |
| Test Window | A ‘test window’ is the name given to the time allocated to test all of the capacity and service types associated with an order (or in some cases multiple orders).Test windows generated from these time scales are for guidance to scheduling teams only and may be rounded to the nearest whole day (and may not be applied for large projects consisting of 5 or more routes in one test window). |
| Working Day | Each working day (Monday to Friday) is a standard 8hrs in duration, consisting of a morning slot (9am-12pm) and an afternoon slot (2pm-5pm), however this may be adjusted by local / bilateral agreement. |
| \* Associated | Means limited to only those E1s carrying the signalling links under test. |

**2.10 Test Case 2a / 2b Criteria**

The normal test case for all subsequent routes is Test Case 2a; however, a Test Case 2b may be agreed as an alternative at the time of booking, provided both parties agree and the switch combination is not restricted by the BT IRO.

**2.11 Post Test Revisit**

After completion of a Test Case 1a or 1b, once traffic has been applied, BT will monitor the interconnect route to ensure that the signalling etc. is still performing to the tested parameters.

Should issues be found in relation to the CPs switch, the CP will be contacted via the TAM and be asked to respond and subsequently instigate changes to data etc. as required.

Should issues be found in relation to the BT switch, the CP will be contacted via the TAM and be informed of the changes to be made to data etc. as required to correct the issue (or to detail why this is not possible).

If service affecting issues are found, routes may need to be taken out of service and / or re-testing required to take place at the same or higher test case as deemed appropriate.

**2.12 Line Type Definitions**

The following definitions should be noted when reading test lists:

|  |  |
| --- | --- |
| **2e** | ISDN2e Line (e.g. NTE8a Type Terminating equipment) |
| **D2** | Pre-ETSI ISDN (e.g. NTE6c Type Terminating equipment) |
| **DEL** | Analogue Direct Exchange Line (e.g.NTE5 Type Terminating equipment) |
| **Mob** | Mobile handset |

**2.13 Testing Requirements Change Process**

The testing requirements change process can be found on the next page.



**2.14 Testing Responsibilities for CPs**

For all testing the CP must supply (at its own cost) the items listed below, unless previously agreed otherwise:

|  |  |
| --- | --- |
| **Requirement** | **Notes** |
| **BT Direct Exchange Lines** | If the BT testing officer is attending the CP’s site (see sub-section 2.3) to perform testing, the CP must provide, two same exchange BT DELs (not PABX lines) to facilitate the testing. One of the lines must be provided with call diversion and network based voice messaging. |
| **Direct Exchange Line connected to CP’s Switch** | Only required if the CP is having a Geographic Service on the routes to be tested. The DEL must be directly connected to the switch to be tested (not a PBX extension etc.) and must be capable of providing appropriate line statii, as described in the OTMs (e.g. ‘Out of Order’) and be provided with call diversion and network based voice messaging.A DEL will also be required (to initiate calls) if the CP is only offering egress (calls to BT) routes (unless calls can be sent from elsewhere).The DEL must be located in the testing location if the BT testing officer is working at the customer’s site (see sub-section 2.3) |
| **Mobile Handset** | *Mobile CPs Only*. A fully functioning mobile handset on a ‘test’ cell site which will be able to send and receive calls via the CP switch under test |
| **ISDN Line & NTE** | ISDN equipment (line plus NTE or Tester) which must be directly connected to the switch being tested |
| **Non Geographic & Personal Numbering Test Numbers** | Where the CP is providing NTS or PNS/PAS services, the CP must be able to translate one of the numbers on each of it’s codes to a BT number and send them back to BT (e.g. 0800 123 4567 🡺 020 8123 4567). This should be by a translation of individual numbers method and **not** a network type translation (unless agreed otherwise) |
| **International** | If the CP switch is designed for the use of originating or terminating international traffic, the CP must ensure a suitable live international destination is available for a limited proportion of the testing. |

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**3 Testing Manual References**

**3.1 Glossary of Terms**

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| **Term (A-L)** | **Meaning** |
| AAR | Automatic Alternative Routeing |
| ACR | Anonymous Call Reject |
| AIS | Alarm Indication Signal |
| AMC | Auto Manual Centre |
| ARR | Automatic Re-Routeing |
| BPS | Bits Per Second |
| BT | British Telecommunications plc (“BT“) |
| CCBS | Call Completion Busy Subscriber |
| CCWF | Call Completion When Free |
| CDR | Call Duration Record |
| CHC | Call Handling Centre (aka Customer Contact Centre) |
| CLI | Calling Line Identity |
| CND | Calling Number Display |
| CP | Communications Provider  |
| CSA | Called Subscriber Answer |
| CSC | Called Subscriber Clears |
| CSH | Called Subscriber Held |
| CTC | Customer Technical Centre |
| DDF | Digital Distribution Frame |
| DEL | Direct Exchange Line |
| DLE | Digital Local Exchange |
| DOB | Diversion On Busy |
| DONR | Diversion On No Reply |
| DX | Distant eXchange |
| DN | Destination Number |
| EA | Emergency Assistance |
| EET | Equipment Engaged Tone |
| EI | Electrical Interface |
| I/C | Incoming |
| I/W | Interworking (Indicator) |
| IA | Indirect Access |
| IDDF | Intermediate Digital Distribution Frame |
| ISDN | Integrated Services Digital Network |
| ISUP | Integrated Services User Part |
| ITM | Interconnect Testing Manager (BT) |
| IRO | Interconnect Responsible Officer [Testing and Signalling Policy Owner] |
| IST | Interconnect Support Team (BT) |
| ITO | Interconnect Testing Officer (BT) |
| ITU | International Telecommunications Union |
| IUP | Interconnect User Part |
| LDLI | Last Diverting Line Identity |
| LE | Local Exchange |
| LMS | Level Measuring Set |
| LPRI | Last Party Release Indicator |
| LTE | Line Terminal Equipment |

**3.1 Glossary of Terms (Contd)**

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| --- | --- |
| **Term (M-Z)** | **Meaning** |
| MCI | Malicious Call Intercept |
| MS | Mobile Station |
|  MT | Mobile Terminated |
| NICC | National Interconnect Consultative Committee |
| NIF | Network Integration Facility |
| NN | Network Number (Calling Line Identity) [often known as Electrical Number] |
| NNG | National Number Group |
| NOA | Nature of Address (Indicator) |
| NOU | Network Operations Unit |
| NTS | Number Translation Services |
| O/G | Outgoing |
| OCB | Outgoing Calls Barred |
| OMC | Operations and Maintenance Centre |
| OOO | Out Of Order |
| OOS | Out Of Service |
| OPI | Operator Indicator |
| OTM | Operational Test Manual |
| PAS | Personal Assistant Service |
| PATS | Publicly Accessible Telephony Service |
| PI | Protection Indicator |
| PN(I) | Presentation Number (Indicator) |
| PNS | Personal Number Service |
| POC | Point of Connection (point of physical connection between CP and BT networks) |
| PRS | Premium Rate Service |
| RANN | Recorded ANNouncement |
| RBWF | Ring Back When Free |
| RES | Reserved (field) |
| RPI | Release Protocol Indicator |
| RSN | Reason |
| RTNR | Ring Tone No Reply |
| RX | Receive (leg) |
| SC | Switch Connection |
| TMS | Tele Marketing Services |
| TTA | Test Traffic Allowed |
| TX | Transmission (also Transmit) |
| UDI | Unrestricted Digital Interface |
| UP | User Part |
| USI | User Service Information |

**3.2 Standards References**

The testing manuals have been developed with regard to the following signalling standards:

3.2.1 International

ITU Switching & Signalling documents Q700-788 can be found [here](http://www.itu.int/rec/recommendation.asp?type=products&lang=e&parent=T-REC-Q).

3.2.2 European

ETSI documents for ETSI ISUP can be found [here](http://www.etsi.org/WebSite/Standards/Standard.aspx) (search for “EN 300 356”).

3.2.3 United Kingdom

UK NICC Standards can be found [here](http://www.niccstandards.org.uk/publications/public-net.cfm) (ND 1005-10 apply).

3.2.4 Conflict with Standards

In case of conflict, the OTMs take precedence.

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