

## Using emutel™ Harmony to test to ETSI TS186 025-2

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### Workshop

IMPLEMENTATION EXPERIENCE OF NETWORK PERFORMANCE PARAMETERS  
CONTROL SYSTEMS AND GRANTING REQUIRED LEVEL OF SERVICES QUALITY  
ON THE OPERATOR NETWORKS. SENSOR NETWORKS – AS OPTIMIZATION TOOL  
FOR VEHICULAR TRAFFIC FLOW

# Arcatech – emutel™ Harmony Presentation

1. Introduction to arcatech Ltd
2. Introduction to emutel™ Harmony
3. Implementation of ETSI call flows  
ETSI TS186 025-2 Annex A.2
4. Implementation of ETSI Use Cases  
ETSI TS186 025-2 Section 5
5. Load profiles, ramp, poisson
6. Test reports



# Arcatech – emutel™ Harmony Presentation

## About us...

Based Lisburn, United Kingdom

Design, manufacture and support  
telecom testing equipment

Arcatech's products have been  
providing test solutions for over  
20 years



# Arcatech – emutel™ Harmony Presentation

## emutel™ Harmony Chassis Options:



soft|harmony

USB dongle

SIP / H.323 Bulk  
Call Generator



harmony|compact

1 card system

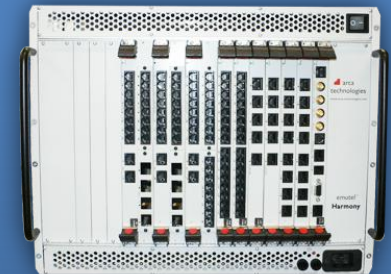
Network Simulation  
Call Generation  
VoIP, ISDN, POTS



harmony|developer

5 card system

Network Simulation  
Call Generation  
VoIP, ISDN, POTS



harmony|enterprise

15 card system

Network Simulation  
Call Generation  
VoIP, ISDN, POTS

# Arcatech – emutel™ Harmony Presentation

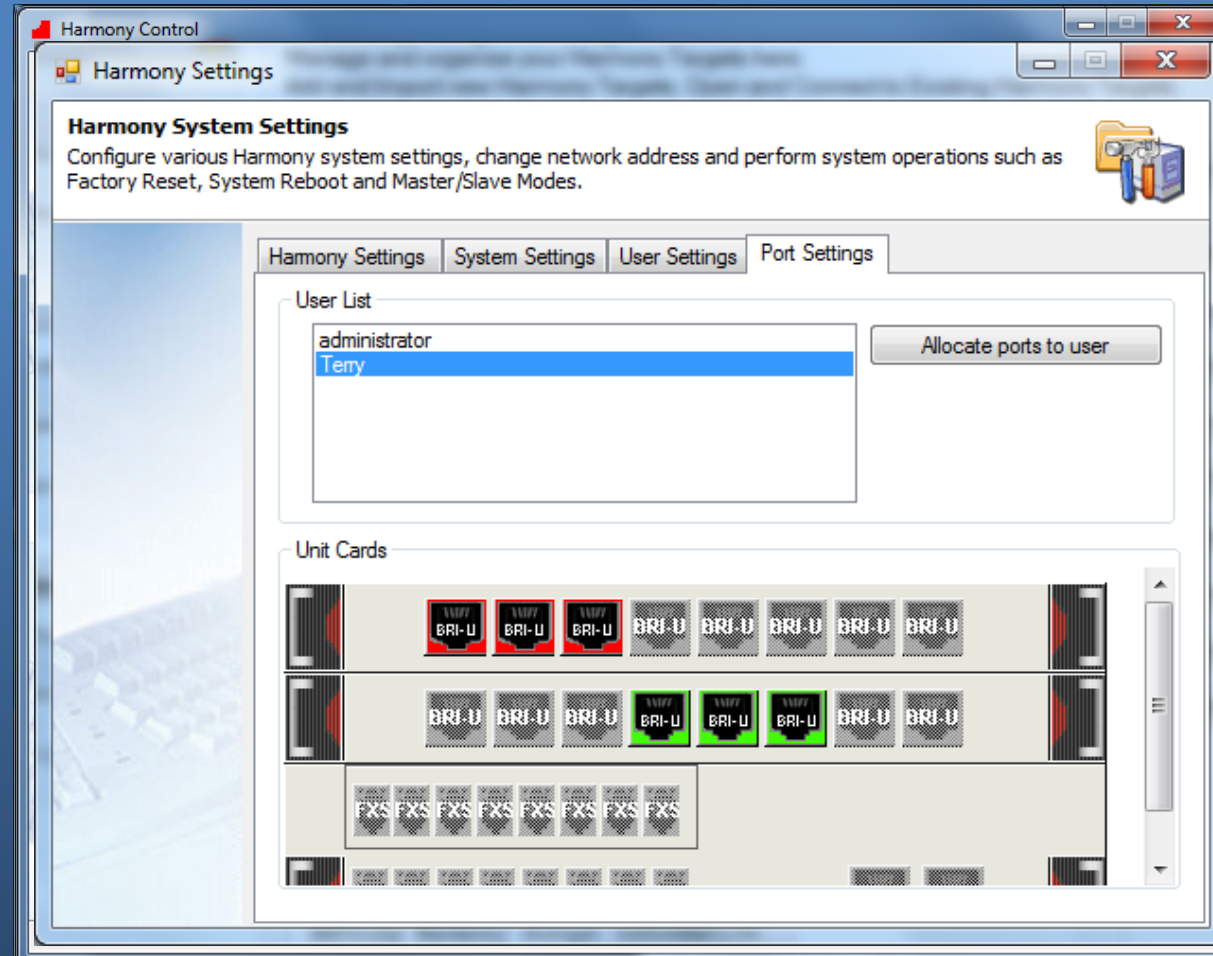
## emutel™ Harmony Control Application:

Control application –  
used for system management.

Unit configuration and upgrade.

Script/Test case management.

Multi-user configuration.



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## emutel™ Harmony Composer Application:

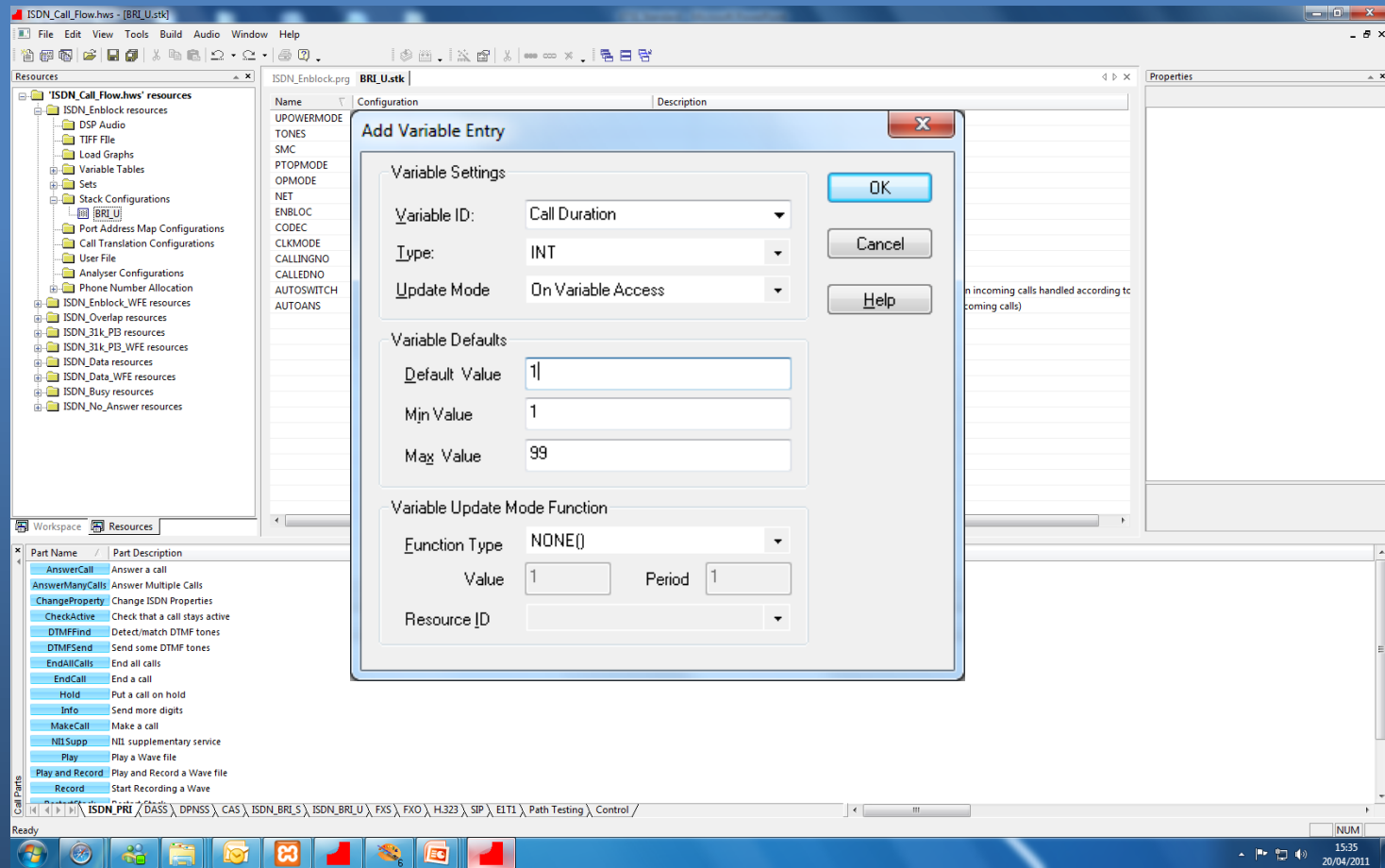
Composer –  
used for script test  
case creation

Script resources –  
enables you to add  
audio files, list of  
telephone numbers

Configure individual  
call part parameters

Setup stack  
parameters

Create variables



# Arcatech – emutel™ Harmony Presentation

## emutel™ Harmony Conductor Application:

Conductor –  
used for script  
execution and  
analysis of results

Live indication of  
running script.

Live graphing  
indicating active  
calls and call rates  
over time.

Call Ladder  
Diagrams.

Call Events.

The screenshot displays the emutel Harmony Conductor application interface. The main window, titled "NewPoisson\_NewCRT Events - [ Default Event Filter: NewPoisson\_NewCRT [TCP/IP:56103] ]", shows a list of call events with columns for Time Stamp, Message Type, Line Card, Direction, From Type, Call ID, Param 1, Param 2, Param 3, and Param 4. The events are sorted by Time Stamp, showing a sequence of call setup and completion messages.

Time Stamp	Message Type	Line Card	Direction	From Type	Call ID	Param 1	Param 2	Param 3	Param 4
0202 11:31:08.160710	[0001] ISDN Make Call	Card 1		From [0016][SCRIPT] To [0014][ISDN Layer4]	Call ID = 9	---	---	---	---
0203 11:31:08.164790	[0001] SCR Ack	Card 1		From [0014][ISDN Layer4] To [0016][SCRIPT]	Call ID = 9	---	---	---	---
0204 11:31:08.206379	[0133] ISDN Setup Indication	Card 2	<==	From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 19	Port = 2	B Chan = 1	Call Type = 1	Type = 101
0205 11:31:08.215397	[0174] ISDN Conn index	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 19	Port = 2	---	Conn index = 0	---
0206 11:31:08.215884	[0163] ISDN Called Party Number	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 19	Port = 2	---	---	Called Party Number: 341010
0207 11:31:08.216195	[0164] ISDN Calling Party Number	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 19	Port = 2	---	---	Calling Party Number: 341020
0208 11:31:08.216208	[0168] ISDN PI#	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 19	Port = 2	---	Conn index = 0	PI# = 0
0209 11:31:09.189139	[0005] SCR Delay Timeout	Card 1		From [0050][TIME] To [0016][SCRIPT]	Call ID = -1	Port = -1	---	---	---
0210 11:31:09.189898	[0007] SCR Call ID	Card 1		From [0016][SCRIPT] To [0016][SCRIPT]	Call ID = 10	ID Upper = 0	ID Lower = 4243456	Port = 3	Type = 101
0211 11:31:09.189912	[0022] SCR MC Start	Card 1		From [0016][SCRIPT] To [0016][SCRIPT]	Call ID = 10	ID Upper = 0	ID Lower = 4243456	Port = 3	---
0212 11:31:09.190455	[0001] ISDN Make Call	Card 1		From [0016][SCRIPT] To [0014][ISDN Layer4]	Call ID = 10	---	---	---	---
0213 11:31:09.194077	[0001] SCR Ack	Card 1		From [0014][ISDN Layer4] To [0016][SCRIPT]	Call ID = 10	---	---	---	---
0214 11:31:09.227685	[0133] ISDN Setup Indication	Card 2	<==	From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 17	Port = 3	B Chan = 1	Call Type = 1	Type = 101
0215 11:31:09.238431	[0153] ISDN Conn index	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 17	Port = 3	---	Conn index = 0	---
0216 11:31:09.238798	[0163] ISDN Called Party Number	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 17	Port = 3	---	---	Called Party Number: 341010
0217 11:31:09.239088	[0164] ISDN Calling Party Number	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 17	Port = 3	---	---	Calling Party Number: 341020
0218 11:31:09.239102	[0168] ISDN PI#	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 17	Port = 3	---	Conn index = 0	PI# = 0
0219 11:31:09.332799	[0125] ISDN Proceeding Indication	Card 1		From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 9	Port = 2	B Chan = 1	Call Type = 1	---
0220 11:31:09.403719	[0132] ISDN Setup Confirm	Card 1		From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 9	Port = 2	B Chan = 1	Call Type = 1	---
0221 11:31:09.403743	[0153] ISDN Call Setup Time	Card 1		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 9	Port = 2	B Chan = 1	Conn index = 0	Time = 1242
0222 11:31:09.405803	[0002] SCR Ok	Card 1		From [0014][ISDN Layer4] To [0016][SCRIPT]	Call ID = 9	---	---	---	---
0223 11:31:09.440463	[0131] ISDN Setup Complete	Card 2		From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 19	Port = 2	B Chan = 1	Call Type = 1	---
0224 11:31:09.442568	[0002] SCR Ok	Card 2		From [0014][ISDN Layer4] To [0016][SCRIPT]	Call ID = 19	---	---	---	---
0225 11:31:09.445997	[0006] ISDN Wait For End Call	Card 2		From [0016][SCRIPT] To [0014][ISDN Layer4]	Call ID = 19	---	---	---	---
0226 11:31:09.447906	[0001] SCR Ack	Card 2		From [0014][ISDN Layer4] To [0016][SCRIPT]	Call ID = 19	---	---	---	---
0227 11:31:10.189144	[0005] SCR Delay Timeout	Card 1		From [0050][TIME] To [0016][SCRIPT]	Call ID = -1	Port = -1	---	---	---
0228 11:31:10.189911	[0007] SCR Call ID	Card 1		From [0016][SCRIPT] To [0016][SCRIPT]	Call ID = 11	ID Upper = 0	ID Lower = 4259840	Port = 4	Type = 101
0229 11:31:10.189924	[0022] SCR MC Start	Card 1		From [0016][SCRIPT] To [0016][SCRIPT]	Call ID = 11	ID Upper = 0	ID Lower = 4259840	Port = 4	---
0230 11:31:10.190468	[0001] ISDN Make Call	Card 1		From [0016][SCRIPT] To [0014][ISDN Layer4]	Call ID = 11	---	---	---	---
0231 11:31:10.194088	[0001] SCR Ack	Card 1		From [0014][ISDN Layer4] To [0016][SCRIPT]	Call ID = 11	---	---	---	---
0232 11:31:10.227463	[0133] ISDN Setup Indication	Card 2	<==	From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 27	Port = 4	B Chan = 1	Call Type = 1	Type = 101
0233 11:31:10.441296	[0174] ISDN Conn index	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 27	Port = 4	---	Conn index = 0	---
0234 11:31:10.441662	[0163] ISDN Called Party Number	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 27	Port = 4	---	---	Called Party Number: 341010
0235 11:31:10.441958	[0164] ISDN Calling Party Number	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 27	Port = 4	---	---	Calling Party Number: 341020
0236 11:31:10.441971	[0168] ISDN PI#	Card 2		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 27	Port = 4	---	Conn index = 0	PI# = 0
0237 11:31:10.629950	[0125] ISDN Proceeding Indication	Card 1		From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 10	Port = 3	B Chan = 1	Call Type = 1	---
0238 11:31:10.703562	[0132] ISDN Setup Confirm	Card 1		From [0015][ISDN Stack] To [0014][ISDN Layer4]	Call ID = 10	Port = 3	B Chan = 1	Call Type = 1	---
0239 11:31:10.703586	[0153] ISDN Call Setup Time	Card 1		From [0014][ISDN Layer4] To [0014][ISDN Layer4]	Call ID = 10	Port = 3	B Chan = 1	Conn index = 0	Time = 1513
0240 11:31:10.705487	[0002] SCR Ok	Card 1		From [0014][ISDN Layer4] To [0016][SCRIPT]	Call ID = 10	---	---	---	---

The interface also includes a "Script Control" window showing a timeline of script execution with a "Total lapse time" of 00:00:00. A "Call Ladder Diagram" window displays a sequence of call events, including "SCR On - 21" at 11:31:46.747263 and "SCR On - 19" at 11:31:45.746167. The system tray shows the date 20/04/2011 and time 12:20.

# Arcatech – emutel™ Harmony Presentation

## emutel™ Harmony features:

Multiple Interfaces supported in one system.

Multiple protocols supported simultaneously on each line card.

Ports configurable to be either Network or User side.

Individual port configuration, allowing for multiple test scenarios in one script.

Multiple units controlled as if they were all one.





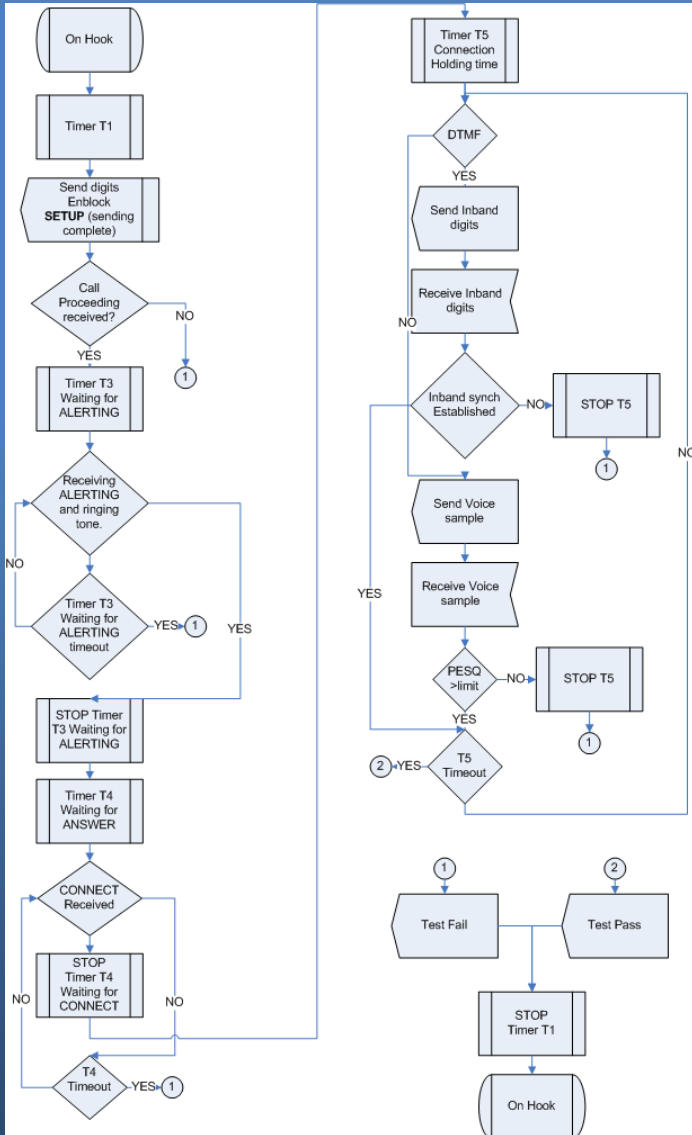
## ETSI call flows: 2 examples

ETSI TS186 025-2 v<2.0.12> Annex A.2.4 – ISDN user making a call  
The Harmony call parts required to implement call flow

ETSI TS186 025-2 v<2.0.12> Annex A.2.5 – ISDN user answering a call  
The Harmony call parts required to implement call flow

# ETSI TS186 025-2 v<2.0.12> Annex A.2.4

The call flow for the ISDN environment for voice calling side with enblock sending



MC - Make Call, transmits a setup message to the network and waits for the required messages to establish a connection.

RPTST – Repeat Start, can be used to configure how long the call will last for.

DTMFS – DTMF Send, will send a string of DTMF digits during the call.

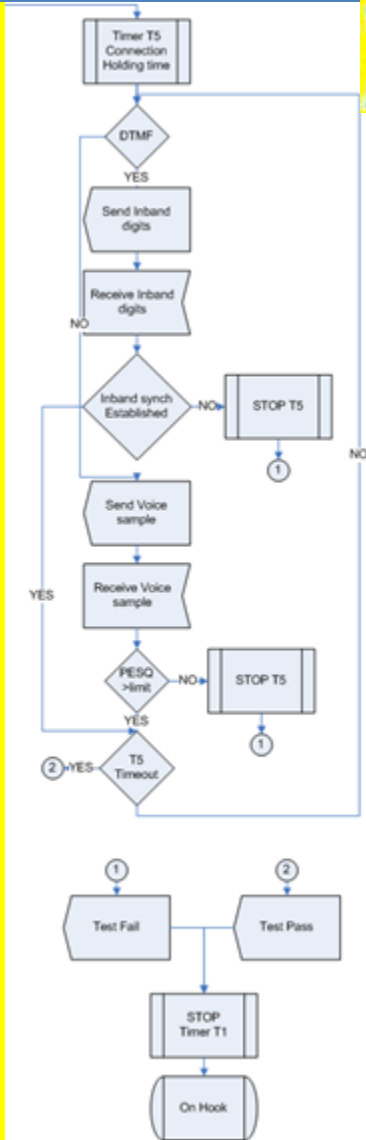
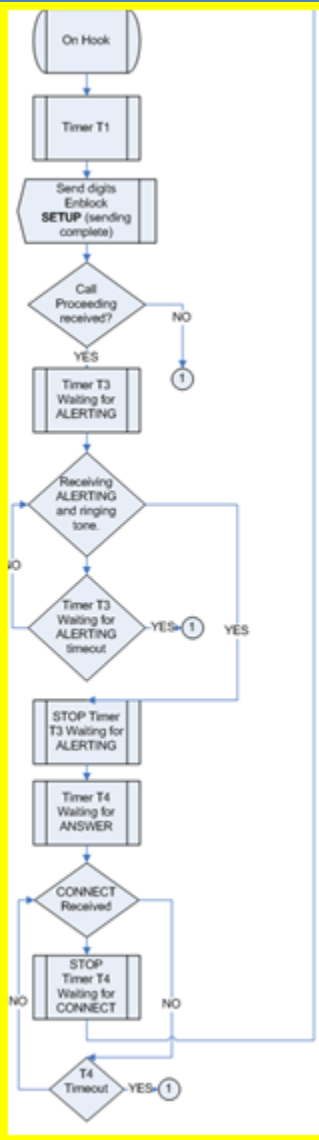
DTMFF – DTMF Find, will wait for a predefined string of DTMF digits.

RPTND – Repeat End, the end of the repeat loop.

EC – End Call, transmits the required messages to end the call.

# ETSI TS186 025-2 v<2.0.12> Annex A.2.4

The call flow for the ISDN environment for voice calling side with enblock sending



MakeCall Properties

General Properties	
Enabled	
TIMEOUT	0
COMPLETION	
CAUSE	
TYPE	
ENBLOC	
CALLEDNO	
CALLINGNO	
CODEC	
BEXCLUSIVE	
BCHAN	
Parameter Type	Number
BCHAN	0
TEL	
Parameter Type	String
TEL	342020
FROMTEL	
Parameter Type	String
FROMTEL	342010
DESTCALLAPP	
TIMEDIGITS	
TERMINAL	

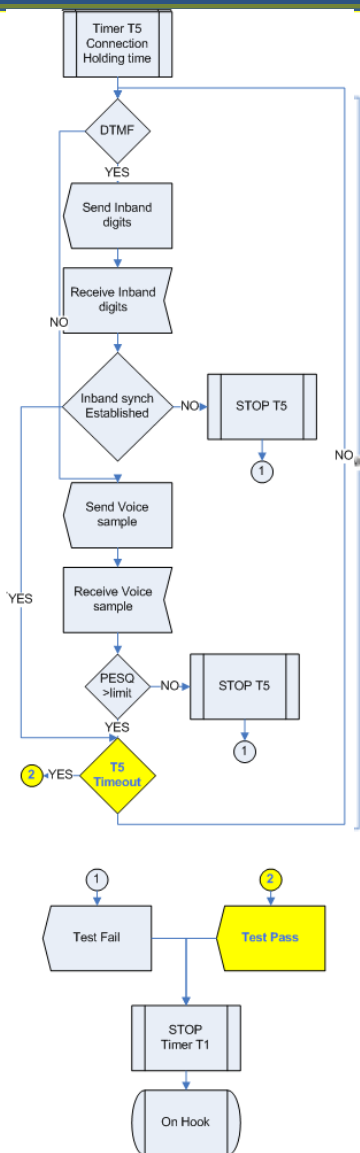
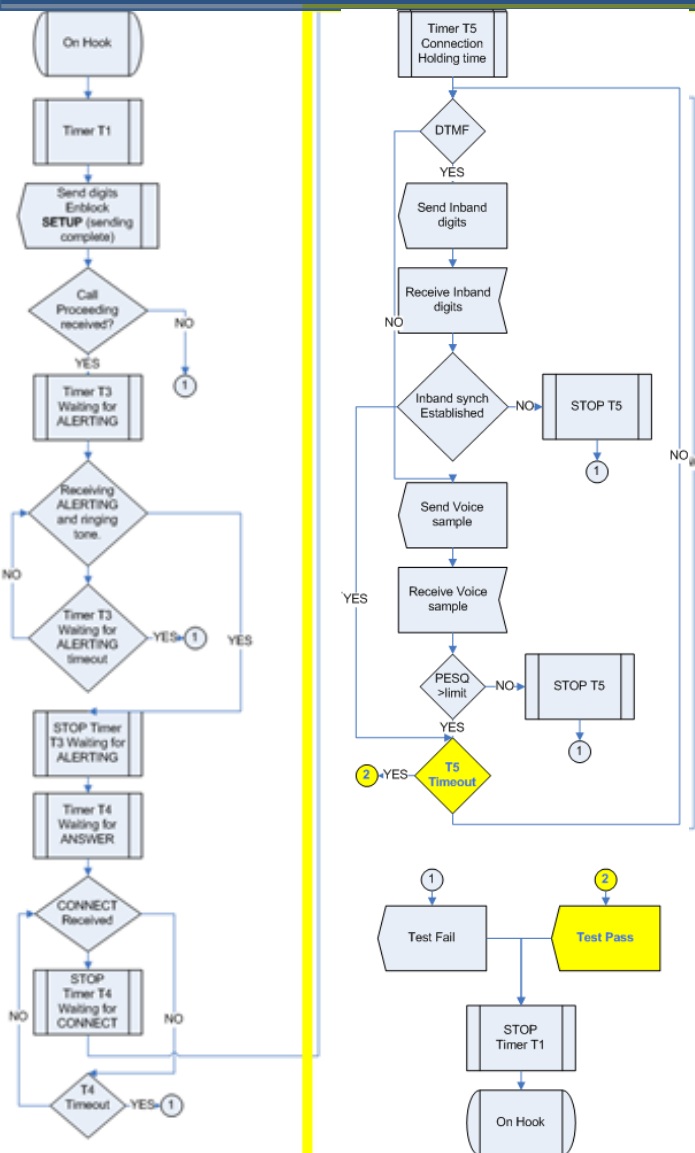
ENBLOC – can select whether the phone number should be sent Enblock or Overlap.

TEL – Specifies what the Called Party number should be.

FROMTEL – Specifies what the Calling Party number should be.

# ETSI TS186 025-2 v<2.0.12> Annex A.2.4

The call flow for the ISDN environment for voice calling side with enblock sending



Repeat Start Properties	
General Properties	
Enabled	TRUE
USEFLAG	CLEAR
DUR	
Parameter Type	Number
DUR	10000
CNT	
DTMF Send Properties	
General Properties	
Enabled	TRUE
TIMEOUT	0
DTMFDURATION	50
DTMFGAP	50

DTMF Find Properties	
General Properties	
Enabled	TRUE
TIMEOUT	0
DTMFMAXDIGITS	
DTMFDIGITS	
Parameter Type	String
DTMFDIGITS	54321
TIME	
EndCall Properties	
General Properties	
Enabled	
TIMEOUT	0
CAUSE	

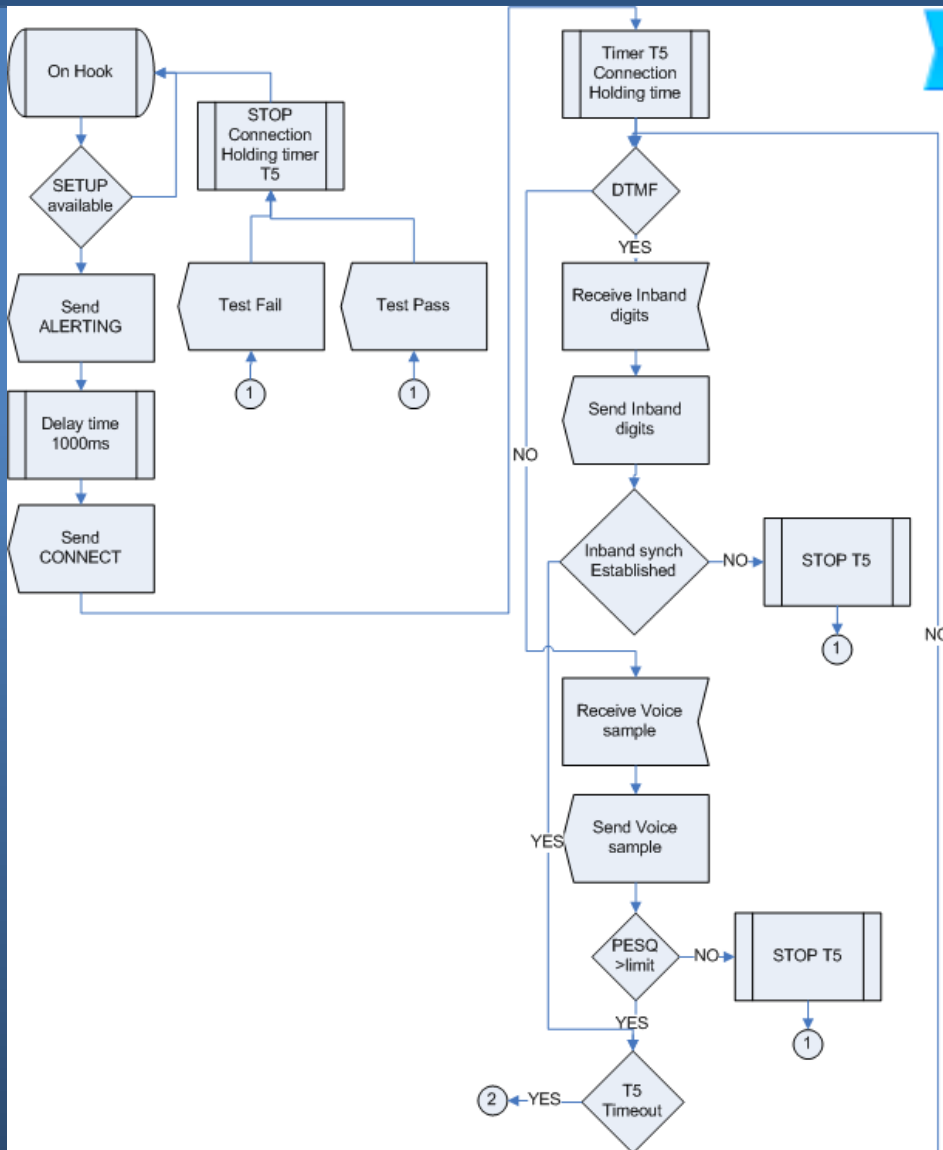
EndCall Properties	
General Properties	
Enabled	
TIMEOUT	0
CAUSE	

EndCall Properties	
General Properties	
Enabled	
TIMEOUT	0
CAUSE	

Actions on an established call

# ETSI TS186 025-2 v<2.0.12> Annex A.2.5

## The call flow for the ISDN environment for voice calls called side



AC – Answer Call, will answer any incoming call, or will only answer calls addressed to a particular Called Party number.

RPTST – Repeat Start, can be used to configure how long the call will last for.

DTMFF – DTMF Find, will wait for a predefined string of DTMF digits.

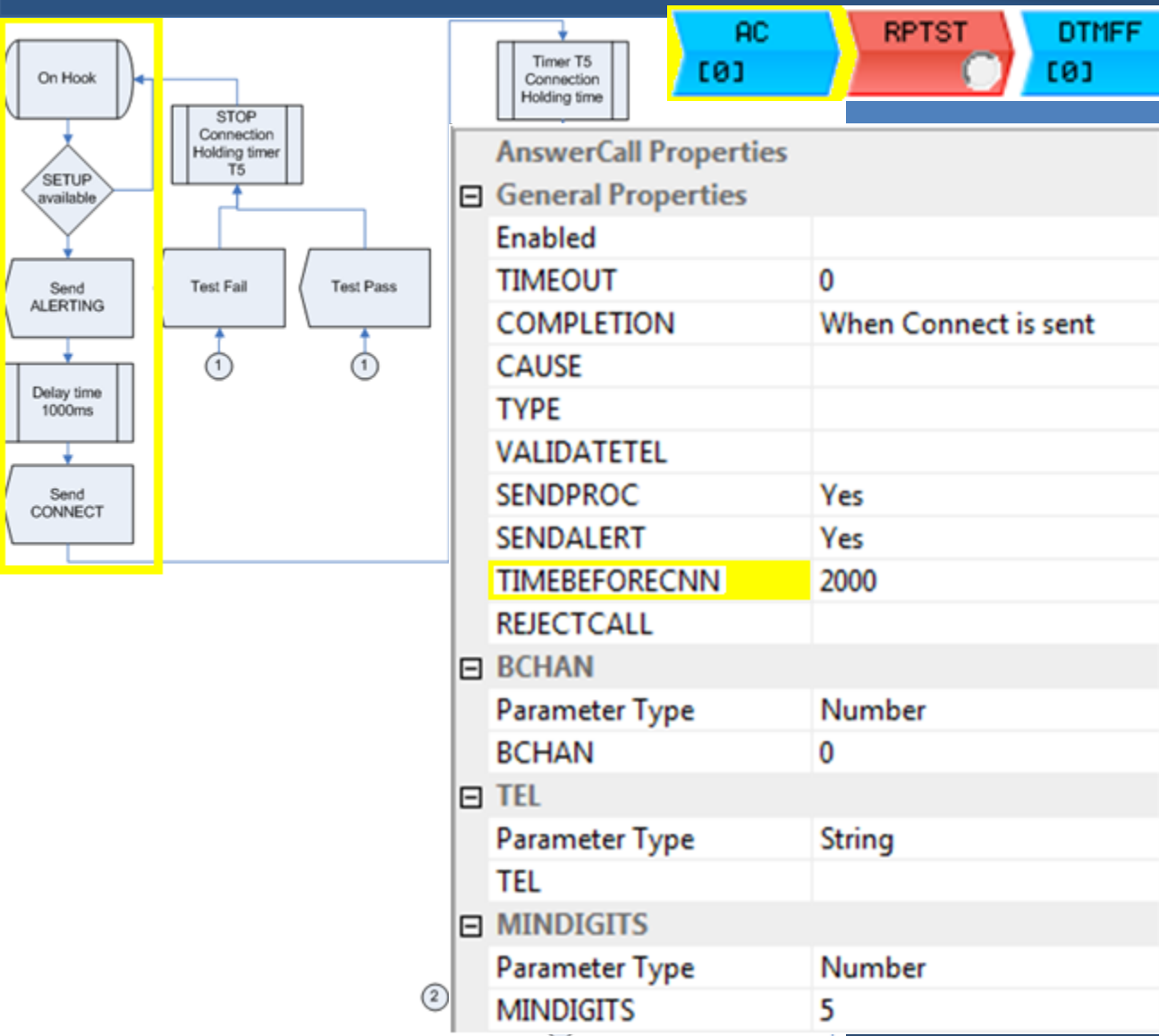
DTMFS – DTMF Send, will send a string of DTMF digits during the call.

RPTND – Repeat End, the end of the repeat loop.

WFE – Wait for End, waits for the disconnect message from the network.

# ETSI TS186 025-2 v<2.0.12> Annex A.2.5

The call flow for the ISDN environment for voice calls called side



Completion – sets up when the call part should complete.

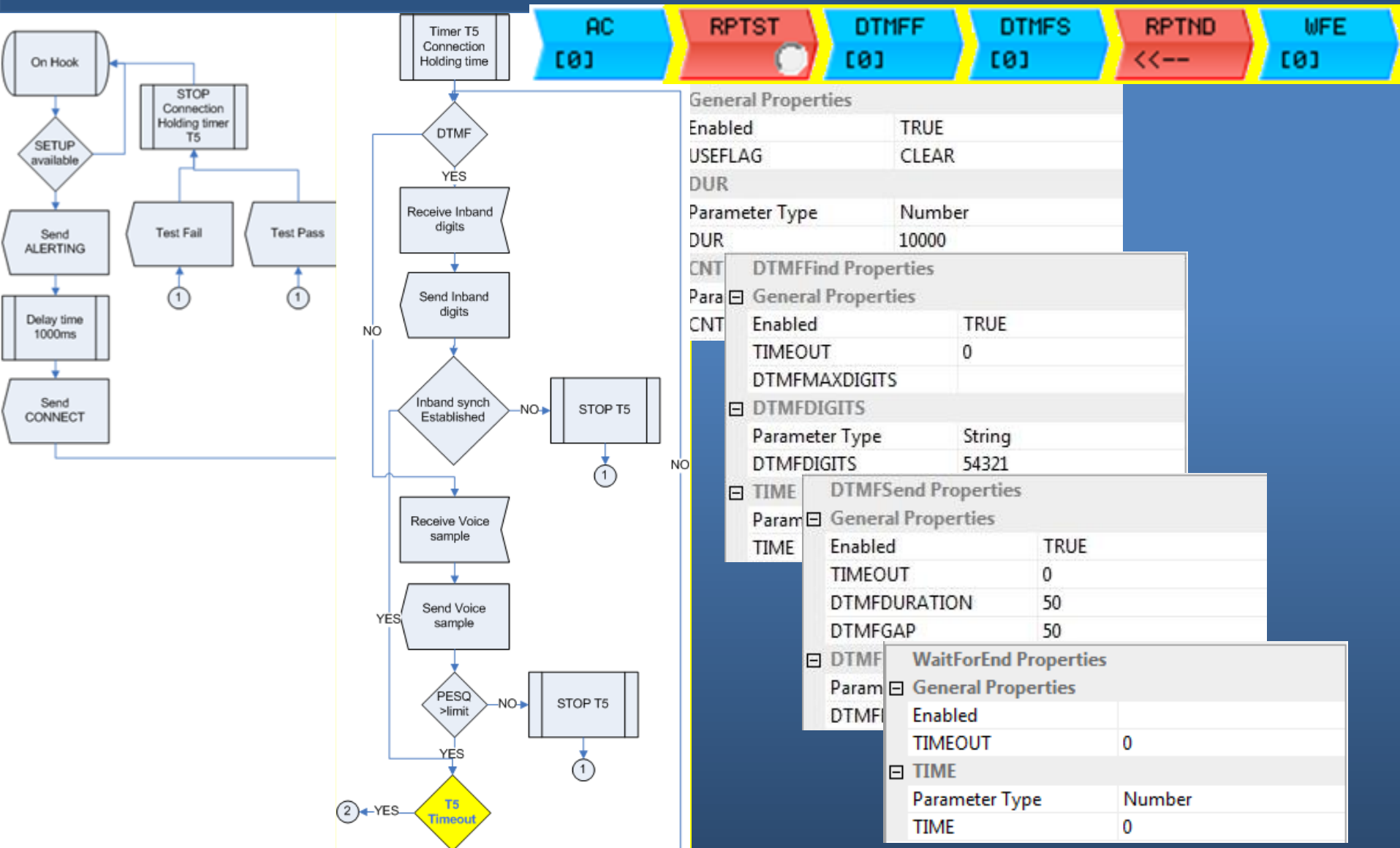
SENDPROC – sets up that call proceeding should be sent.

SENDALERT – sets up that alerting should be sent.

TIMEBEFORECNN – can be used to give a delay before sending the Connect message to the network, just like the delay in a user answering a call.

# ETSI TS186 025-2 v<2.0.12> Annex A.2.5

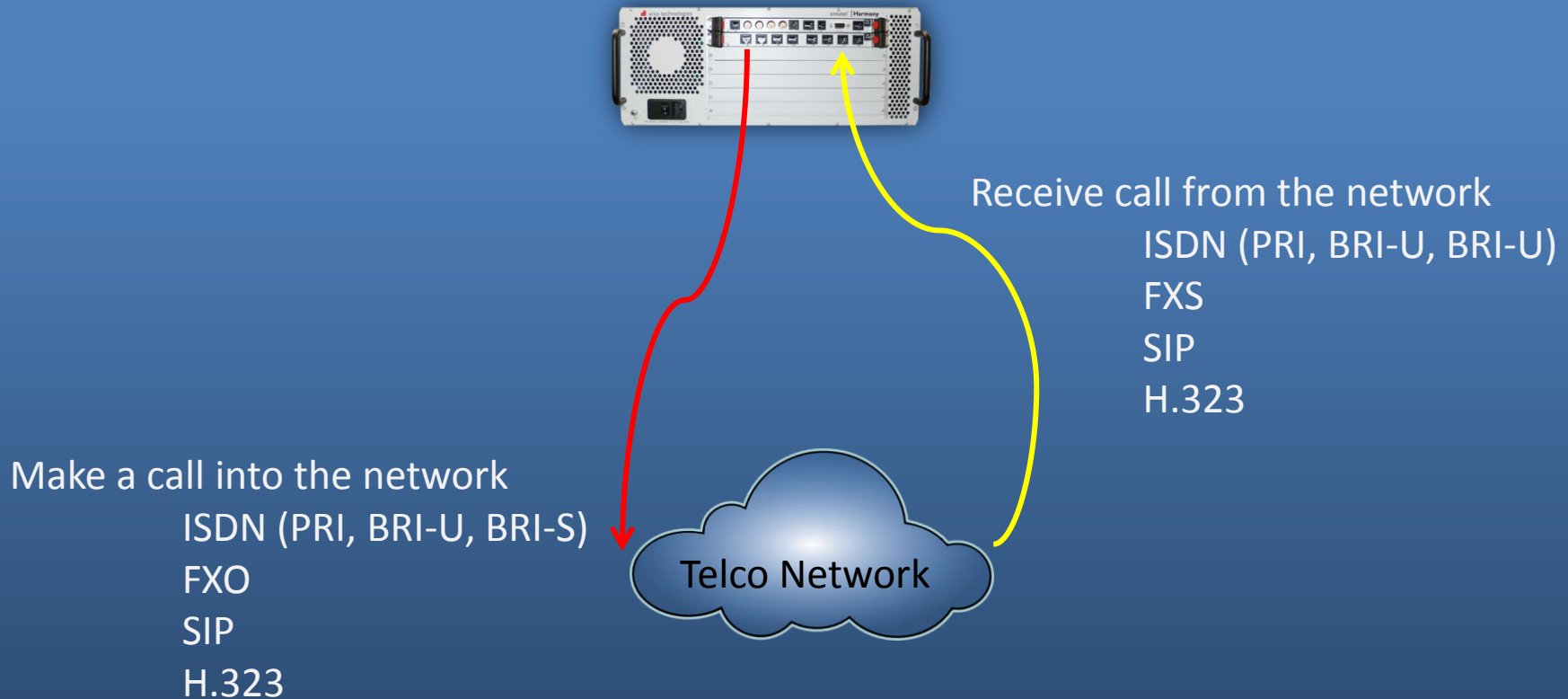
The call flow for the ISDN environment for voice calls called side



Actions on an established call

## Section 5 Use Cases

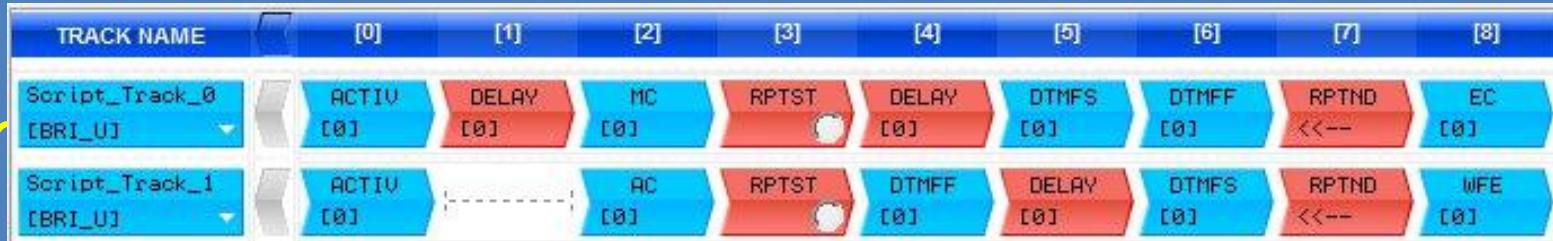
The emutel™ Harmony can be used to implement complete use cases. Implementing both the calling user and the called user in the same script.





# ISDN – ISDN Use Case 1

1.1 Basic call with bearer capability speech and enblock sending.  
The call is released from the calling user.



ACTIV – Activate BRI port

Delay – placed into script before MC to ensure AC is active and ready for an incoming call.

MC – Make call, transmit a setup request message into the network.

RPTST – Repeat Start, sets up how long the call should last for.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

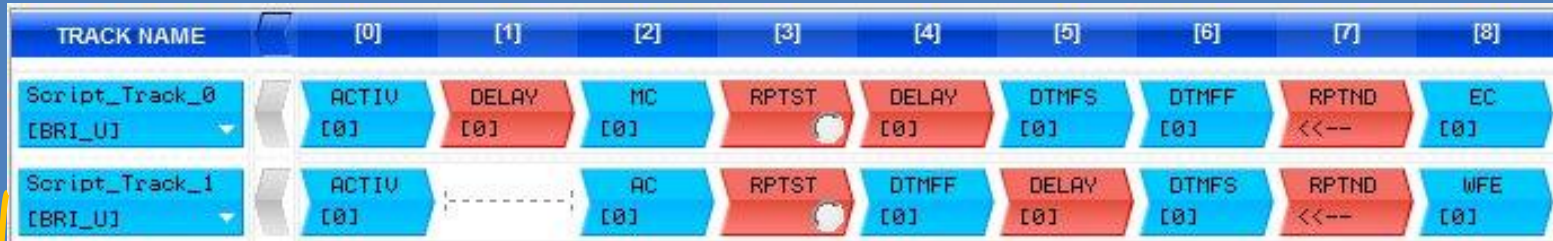
DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

RPTND – Repeat End, end of repeat loop.

EC – End Call, transmit a disconnect request message to the network.

# ISDN – ISDN Use Case 1

1.1 Basic call with bearer capability speech and enblock sending.  
The call is released from the calling user.



ACTIV – Activate BRI port.

AC – Answer call, reply to setup message from network.

RPTST – Repeat Start, sets up how long the call should last for.

DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

RPTND – Repeat End, end of repeat loop.

WFE – Wait for End, wait for disconnect message from network

# ISDN – PSTN Use case 2

## 2.1 Basic call with bearer capability speech and enblock sending. The call is released from the calling user.



ACTIV – Activate BRI port

Delay – placed into script before MC to ensure AC is active and ready for an incoming call.

MC – Make call, transmit a setup request message into the network.

RPTST – Repeat Start, sets up how long the call should last for.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

RPTND – Repeat End, end of repeat loop.

EC – End Call, transmit a disconnect request message to the network.

# ISDN – PSTN Use case 2

2.1 Basic call with bearer capability speech and enblock sending.  
The call is released from the calling user.



AC – Answer call, reply to setup message from network.

RPTST – Repeat Start, sets up how long the call should last for.

DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

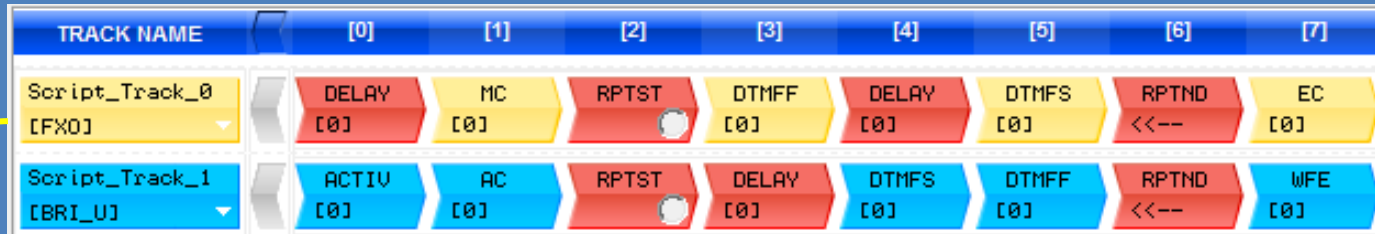
DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

RPTND – Repeat End, end of repeat loop.

WFE – Wait for End, wait for disconnect message from network

# PSTN – ISDN Use case 3

## 3.1 Basic call. The call is released from the calling user. The call is released from the calling user.



Delay – placed into script before MC to ensure AC is active and ready for an incoming call.

MC – Make call, transmit a setup request message into the network.

RPTST – Repeat Start, sets up how long the call should last for.

DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

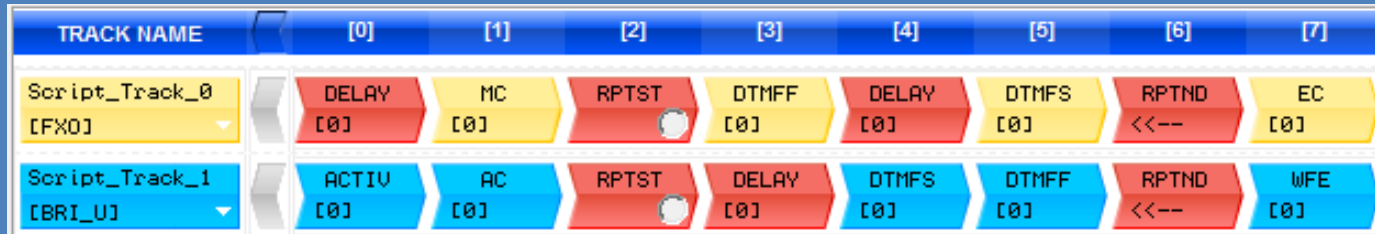
DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

RPTND – Repeat End, end of repeat loop.

EC – End Call, transmit a disconnect request message to the network.

# PSTN – ISDN Use case 3

3.1 Basic call. The call is released from the calling user.  
The call is released from the calling user.



ACTIV – Activate BRI port.

AC – Answer call, reply to setup message from network.

RPTST – Repeat Start, sets up how long the call should last for.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

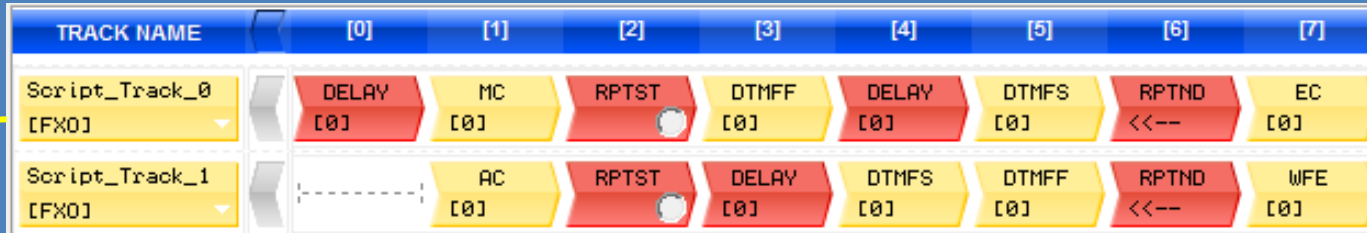
DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

RPTND – Repeat End, end of repeat loop.

WFE – Wait for End, wait for disconnect message from network

# PSTN – PSTN Use case 4

## 4.1 Basic call. The call is released from the calling user.



Delay – placed into script before MC to ensure AC is active and ready for an incoming call.

MC – Make call, transmit a setup request message into the network.

RPTST – Repeat Start, sets up how long the call should last for.

DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

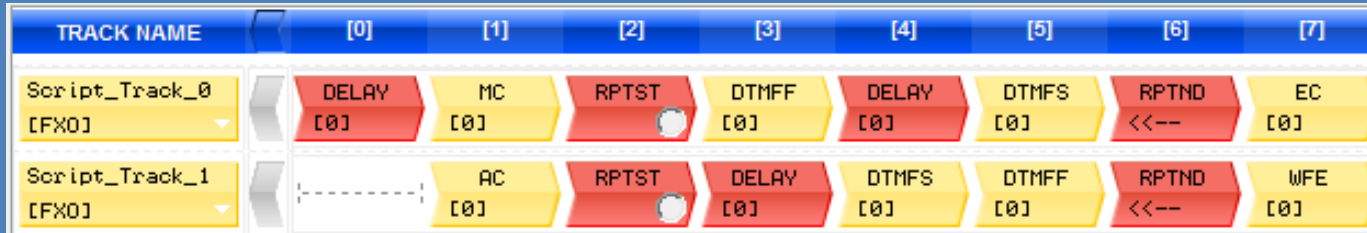
DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

RPTND – Repeat End, end of repeat loop.

EC – End Call, transmit a disconnect request message to the network.

# PSTN – PSTN Use case 4

## 4.1 Basic call. The call is released from the calling user.



AC – Answer call, reply to setup message from network.

RPTST – Repeat Start, sets up how long the call should last for.

DTMFF – DTMF Find, looks for DTMF digits being sent on the B-channel.

Delay – to ensure DTMFF on other side of the call is active. Short time, few ms

DTMFS – DTMF Send, transmits DTMF digits on the B-channel.

RPTND – Repeat End, end of repeat loop.

WFE – Wait for End, wait for disconnect message from network





# Loading Profiles

The Harmony can be used for loading the system under test with a large number of calls.

Calls can be made at various rates (Calls per Second)

Calls can vary in duration (Call Hold Time)

Calls can be made again after a period of time (Call Guard Time)

Different profiles can be used to load the system also





# Test Reports

Reports can be generated for each test carried out on the Harmony.

## Summary Reports –

- Calls Attempts
- Successful calls
- Failed calls
- Average call duration

## Detail Reports –

- Details of port used
- Called Party, Calling Party numbers
- Setup time
- Call duration
- Clear down times
- Setup through time, time for Setup message to be transmitted through system under test.

## PESQ Reports –

- PESQ score
- Delay



# Call Detail Reports

[Home](#)[Call Reports](#)[Voice Reports](#)[Error Reports](#)[Logout](#)

## Call Detail Report

### Test Information

Test Name	ISDN_Enblock
Start Time	15:09:35:00
End Time	15:17:57:00
Duration	00:18:22:00
Call Attempts	80
Call Errors	0

### Call Details

Select All		Unselect All															
[.]	Time	Index	Call ID	Card	Port	Cha	Status	Called Number	Calling Number	T1	T2	T3	T4	T5	T6	T7	T8
<input type="checkbox"/>	15:10:20.28	1	25	2	2		1	342010	342020	135	3543	20014	191	1748	441	23748	
<input type="checkbox"/>	15:10:21.32	2	26	2	1		1	342020	342010	113	3106	20011	1821	1899	294	24938	
<input type="checkbox"/>	15:10:22.42	3	27	2	6		1	342030	342060	149	3689	20016	152	478	1720	23857	
<input type="checkbox"/>	15:10:23.45	4	28	2	5		1	342040	342050	171	3888	20019	171	1720	452	24078	
<input type="checkbox"/>	15:10:24.45	5	29	2	4		1	342050	342040	134	3567	20019	175	1897	327	23761	
<input type="checkbox"/>	15:10:25.49	6	30	2	3		1	342060	342030	201	2519	20016	181	1756	465	22716	
<input type="checkbox"/>	15:10:26.67	7	31	2	7		1	342070	342070	150	3839	20016	172	2030	301	24027	
<input type="checkbox"/>	15:10:27.71	8	32	2	8		1	342080	342080	142	3737	20016	177	2013	301	23930	
<input type="checkbox"/>	15:11:03.23	9	41	2	4		1	342010	342040	135	2313	20010	170	883	1295	22493	
<input type="checkbox"/>	15:11:05.03	10	42	2	2		1	342020	342020	141	2496	20029	170	2056	299	22695	
<input type="checkbox"/>	15:11:06.22	11	43	2	3		1	342030	342030	131	2488	20016	165	2058	299	22669	
<input type="checkbox"/>	15:11:07.30	12	44	2	6		1	342040	342060	161	2365	20014	168	1902	302	22547	
<input type="checkbox"/>	15:11:08.53	13	45	2	5		1	342050	342050	188	2541	20014	133	2055	298	22688	



# Pesq Reports

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## Voice PESQ Report

### Test Information

Test Name	ISDN_Pesq
Start Time	10:09:42:00
End Time	10:13:10:00
Duration	00:04:32:00
Call Attempts	10
Call Errors	0

### PESQ Detail Report [1-10] out of [10]

Index	Channel	PESQ Score	PESQ Mos	PESQ Noise	PESQ Speech	PESQ Mos P800	PESQ Mos LQ	PESQ Average Delay
1	4	4.4711	4.5311	4.4651	4.5000	4.9670	4.4872	3.875
2	5	4.1723	4.3129	4.4984	4.0107	4.6255	4.2886	0.75
3	7	4.4951	4.5457	4.4988	4.4924	4.9944	4.4979	12.75
4	9	4.4127	4.4938	4.4731	4.3666	4.9002	4.4577	0.875
5	11	4.4448	4.5146	4.4983	4.4123	4.9369	4.4745	1
6	13	4.4753	4.5337	4.4711	4.4919	4.9717	4.4891	0.875
7	15	4.3220	4.4309	4.4983	4.2438	4.7966	4.4027	1
8	17	4.4998	4.5485	4.4977	4.4997	4.9998	4.4999	4.375
9	19	4.4746	4.5332	4.4724	4.4839	4.9710	4.4888	1
10	21	4.4690	4.5298	4.4972	4.4509	4.9646	4.4862	0.875



Thank you for your time today

# QUESTIONS

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