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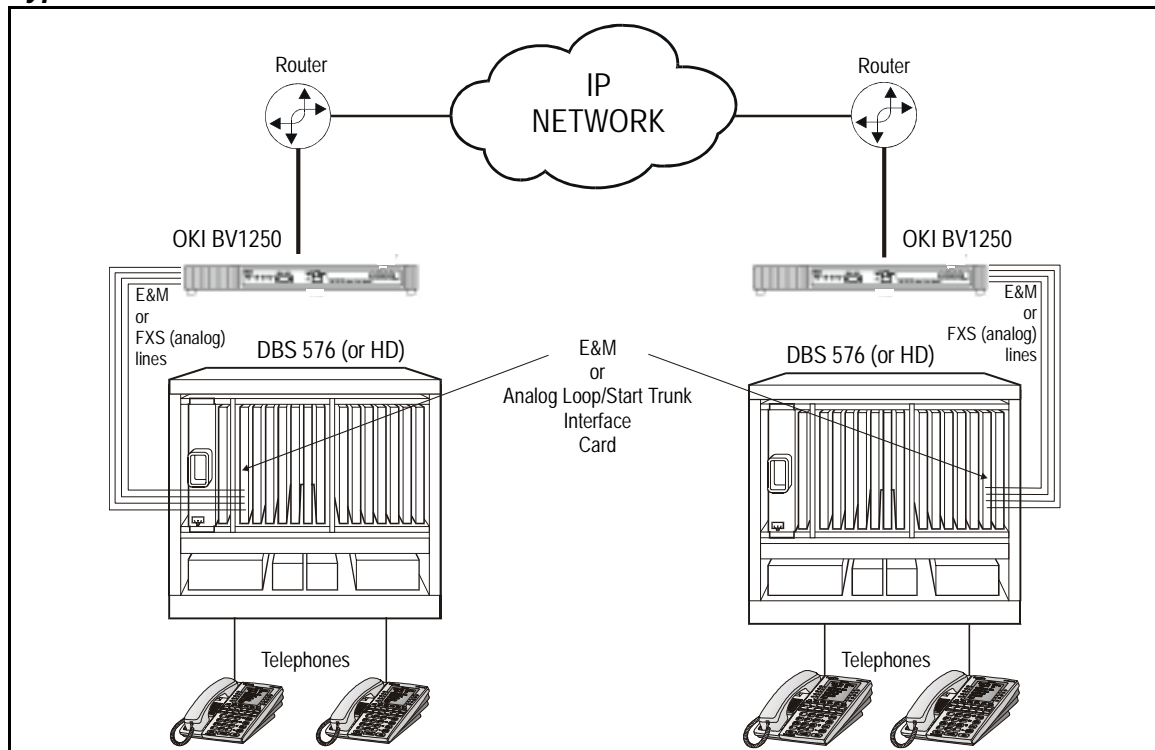
Voice-Over-IP (*with the OKI BV1250 IVG*®)

Overview

In cooperation with Oki Network Technologies, we are pleased to announce the successful addition of the new **Voice-over-IP** feature to the DBS 576 and 576HD Digital Business Telephone Systems. This feature provides an effective method of routing both voice and fax communications over any TCP/IP (Transport Control Protocol/Internet Protocol) network.

When connected through the Oki BV1250 Internet Voice Gateway (IVG) unit, the DBS 576 and 576HD systems can now communicate with digital data networks to more fully make use of existing intranet and internet facilities. Because the communication takes place over digital networks, conventional local and long distance costs are drastically reduced.

Typical DBS576/HD IVG Network Connection



® BV1250IVG is a registered product of Oki Electric Industry Co., Ltd.

The BV1250 converts outgoing voice or data signals into digital format, compresses, and packages the signal for transmission over digital TCP/IP networks. On the incoming side, the BV1250 performs this same process in the opposite fashion, receiving voice or fax data packets and translating them back into the appropriate voice or data signals.

Networking through the OKI BV1250

To make the dialing of the DBS576/HD through the Oki BV1250 gateway as transparent as possible, DBS “Closed Numbering Tables” are used. The BV1250 requires what Oki refers to as an *office code*. This office code may be from one (1)-to-eight (8) digits in length and must be unique to each gateway unit. For a call to route over the unit *without* using Closed Numbering Tables, the user must access dial tone from the unit, dial the office code, and then dial the desired number.

Three types of calls may be made over the IP network:

- 576/HD extension to extension (over E&M)
- 576/HD extension to Oki direct (*no PBX*) extension (over FX)
- 576/HD extension +9 and telephone number to make a call over the local lines of the distant office.

NOTE: The remote telephone system(s) need not be a DBS 576 or 576HD. The only requirement is that the “far end” have an Oki router to decode the call.

Questions?

After reviewing this information, should you have any additional technical questions concerning how to use the Oki BV1250 IVG unit with the DBS576/HD for Voice-over-IP feature, please contact:

For DBS576/HD-related questions:

Panasonic - Business Telephone Systems Division

Phone: (201) 392-4220

General Technical Support hours: 9:00am to 5:00pm, EST

For BV1250 IVG-related questions:

OKI Technical

Phone: (408) 935-3385

Fax: (408) 935-3337

E-mail: support@okint.com

General Technical Support hours: 8:00am to 5:00pm, PST

Programming Procedures

In the following procedures for your reference, we have reproduced portions of the Programming Address boxes from the DBS 576/HD *Programming* manual, Section 400. For full programming details, please consult that particular manual.

Extension-to-Extension Calls

For extension-to-extension calls, verify the following DBS576/HD steps:

- Place the E&M lines or the FXS lines, connected from the BV1250 to the 576/HD, into an outgoing trunk group of their own.

FF5 2 (01-99) (002-577) Hold (1-576) Hold
(enter trunk numbers here)

MCO Outbound Trunk Group Members
(all CPCs) - Version 1.0 or higher
 Assign trunks as members of each MCO Outbound Trunk Group.

FF5 2 (01-99) (002-577) Hold (1-576) Hold

HD: **FF5 2 (01-99) (002-057/093) Hold (1-096) Hold**

↑

MCO Outbound Trunk Group No.
(max. 99 Groups per system)

↑

Member Position:
002=Member #1
003=Member #2
004=Member #3
...
577=Member #576

↑

Trunk No. 1-576
default: (none)

Available range of Members is determined by the CPC installed, and the number of cabinets specified in programming (see 0: **System Configuration**).

- Each telephone system must have a unique numbering plan. This plan can be two (2)-to-four (4) digits in length, and from one (1)-to-four (4) of those digits may be routed in the Closed Number Table. Enter the unique extension numbers of the remote system(s) using these programming addresses:

FF6 2 07 (001-150) 0001 Hold (1-4 digits) Hold
(enter the unique numbers here)

Closed Number Table: PBX Routing Code
(all CPCs) - Version 1.0 or higher
 Define PBX routing codes for up to 150 different Closed Numbers.

FF6 2 07 (001-150) 0001 Hold (1-4 digits) Hold

↑

Closed Number Entry:
001=Closed Number #1
002=Closed Number #2
...
150=Closed Number #150

↑

PBX Routing Code (can be 1-4 digits in length, including digits 0-9, * and #)
default: [no assignment]

FF6 2 07 (001-150) 0002
Hold (enter the number of follow digits here)

Closed Number Table: Follow Digit Maximum

(all CPCs) - Version 1.0 or higher

For each Closed Number, specify the maximum number of digits that can be dialed after the PBX routing code.

FF6 2 07 (001-150) 0002 Hold (0-16) Hold

↑
 Closed Number Entry:
 001=Closed Number #1
 002=Closed Number #2
 ...
 150=Closed Number #150

↑
 Maximum Number of dialed digits after the Closed Number
default: 0 (no maximum limitation)

FF6 2 07 (001-150) 0005
Hold (enter a route number 1- 200)

Closed Number Table: Route Number

(all CPCs) - Version 1.0 or higher

Assign a route to the Closed Number, depending on the setting in the previous address.

FF6 2 07 (001-150) 0005 Hold (1-200/100) Hold

↑
 Closed Number Entry:
 001=Closed Number #1
 002=Closed Number #2
 ...
 150=Closed Number #150

↑
 Route 1-200 or Route List 1-100
default: 0

3. Program the phone system to route calls to the remote system using the trunk group created in Step 1.

FF6 2 04 (001-200) 0001
Hold (enter the trunk number 01-99)

Route Table: Trunk Group Assignment

(all CPCs) - Version 1.0 or higher

Assign a Trunk Group to each Route.

FF6 2 04 (001-200) 0001 Hold (0-99) Hold

↑
 Route No. 001-200

↑
 Trunk Group No. 1-99

default: 0 (none)

4. As mentioned previously in the *Overview*, the BV1250 requires an **office code**. To prevent the customer from having to enter the code manually, place it into the Digit Modify Table so that the 576/HD inserts the code automatically.

FF6 2 04 (001-200) 0002
Hold (enter the modify table here)

Route Table: Digit Modify Pattern No.

(all CPCs) - Version 1.0 or higher

Assign a Digit Modify Pattern to each Route.

FF6 2 04 (001-200) 0002 Hold (0-50) Hold

↑
 Route No. 001-200

↑
 Digit Modify Pattern No. 1-50

default: 0 [no assignment]

FF6 2 05 (enter the modify table number here as above) 0002 Hold (enter the office code which will route the call through the BV1250 to the correct telephone system)

*Note: Occasionally timing can be critical. Before setting up the Digit Modify Table, program the trunk key appearances for the FX or E&M trunks, and make several test calls. Be aware that there is a delay in receiving dial tone and breaking dial tone. In some cases if the digits are sent too soon or too late, the call will not go through. If this is the case, make note of approximately how long the delay must be to successfully complete a call. When entering the modify digits, place an appropriate number of one-second pauses in front of the office code by pressing the **OT-4** key (as shown above in the address box).*

Digit Modify Table: Add Beginning Digits
(all CPCs) - Version 1.0 or higher
 Specify the digit(s) that the system will add to the beginning of a dialed-digit string when the number is sent to the CO.

FF6	2	05	(01-50)	0002	Hold	(up to 10 char.)	Hold
			▲			▲	
			Digit Modify Pattern No. 01-50			Digits or Codes to be added to the beginning of a dialed number, including:	
			("OT" = One-Touch key)			Digits 0-9	
						* and #	
						OT-4 (for pause)	
						OT-5 + 6 (for DTMF conversion)	
						OT-5 + 9 (for itemized code) - NA USA	
						OT-5 + (1-8) (for auth. code) - NA USA	
						default: (none)	

5. If routing calls to multiple sites, it isn't necessary to segregate the trunks. All calls, regardless of destination, may be routed over the same trunks—the BV1250 accomplishes the routing. However, if multiple office codes are used, these must be placed into different Modify Tables to insert the appropriate code for each extension number or telephone number. Therefore, in **FF6 2 04 (001-200) 0002+** would all have the same trunk group destination, but different Modify Tables.

Outgoing Trunk Calls over Remote Sites' CO lines

Calls that would be long distance in one office on a wide area network (WAN), may be local calls in another office of the same WAN. If Automatic Route Selection (ARS) is enabled, local calls may be routed over the local, and long distance calls may be routed over the BV1250 to the office with local lines with the same country code or area code.

For outgoing trunk calls over the remote sites' CO lines, verify the following steps:

1. Divide trunk lines up according to the desired routing. Place all E&M or FX lines going to the BV1250 into a *single* trunk group regardless of desired routing.

FF5 2 (01-99)(002-577) Hold
 (enter trunk numbers here)

2. Enter the leading digits of the telephone numbers to be dialed. These may be 1+area code, 011+country code, or just prefixes. Using * as a wild card is acceptable when common digits may be dialed (i.e. 14** for area codes 400-499, or 1*** for any 1+ dialing, etc.).

MCO Outbound Trunk Group Members

(all CPCs) - Version 1.0 or higher

Assign trunks as members of each MCO Outbound Trunk Group.

FF5 2 (01-99) (002-577) Hold (1-576) Hold

HD: FF5 2 (01-99) (002-057/093) Hold (1-096) Hold

MCO Outbound
Trunk Group No.
(max. 99 Groups
per system)

Member Position:
002=Member #1
003=Member #2
004=Member #3
...
577=Member #576

Trunk No. 1-576
default: (none)

Available range of Members is determined by the CPC installed, and the number of cabinets specified in programming (see 0: System Configuration).

FF6 0 00 (001-100) 0001 Hold
 (enter the prefix string here)

Leading Digits Table: Prefix String

(all CPCs) - Version 1.0 or higher

Assign up to 100 dial strings, which will be matched with the first dialed digits of outbound calls.

FF6 0 00 (001-100) 0001 Hold (up to 10 digits) Hold

Leading Digits Entry
(Bin) No. 001-100

Leading Digits Prefix String (up to 10 digits)
valid entries: digits 0-9, and * (for wild-card)

default: [no assignment]

FF6 0 00 (001-100) 0003
Hold (enter number of digits
that will follow)

Leading Digits Table: Follow Digit Maximum

(all CPCs) - Version 1.0 or higher
 (for TRS/ARS only) For each Leading Digits entry, enter the maximum number of digits a phone user can dial after the digits defined in **Leading Digits Table: Prefix String** (pg. 6-5).

FF6 0 00 (001-100) 0003 Hold (0-16) Hold

↑
 Leading Digits Entry
 (Bin) No. 001-100

↑
 Maximum No. of Dialed Digits
 allowed after Prefix String (0-16)

**default: 0=no maximum
 limitation**

FF6 0 00 (001-100) 0006
Hold (assign a route
number 1-200)

Leading Digits Table: Route Number

(all CPCs) - Version 1.0 or higher
 (for TRS/ARS only) Assign a route number for each Leading Digits entry, depending on the **Route Type** set in the previous address.

FF6 0 00 (001-100) 0006 Hold (1-200/100/50) Hold

↑
 Leading Digits Entry
 (Bin) No. 001-100

↑
 Route 1-200
 Route List 1-100
 Time List 1-50

default: 0 (no routing)

3. Now tell the route assigned in Step 1 what trunk group to follow using these addresses:

FF6 2 04 (001-200) 0001
Hold (enter the trunk group)

Route Table: Trunk Group Assignment

(all CPCs) - Version 1.0 or higher
 Assign a Trunk Group to each Route.

FF6 2 04 (001-200) 0001 Hold (0-99) Hold

↑
 Route No. 001-200

↑
 Trunk Group No. 1-99

default: 0 (none)

FF6 2 04 (001-200) 0002 Hold
(enter a modify digits table)

Route Table: Digit Modify Pattern No.

(all CPCs) - Version 1.0 or higher
 Assign a Digit Modify Pattern to each Route.

FF6 2 04 (001-200) 0002 Hold (0-50) Hold

↑
 Route No. 001-200

↑
 Digit Modify Pattern No. 1-50
default: 0 [no assignment]

*Note: Since "timing" can be crucial, program a unique key for at least one of the trunks going to the BV1250. Access a dial tone, dial the office code, dial 9, and the telephone number. If the telephone number is dialed too quickly, all or part of the number may be lost while the other system is accessing dial tone. Take note of how much of a pause is required between the "9" and the "telephone number" to complete a call successfully. Then, insert as many one(1)-second pauses as required by pressing the **OT-4** key.*

- To insert the office code and trunk access code, use the "Modify Digits Table" created earlier in the previous step.

FF6 2 05 (01-50) 0002 Hold
(enter the office code assigned to the BV1250 in the desired location, and 9)

Note: Press OT-4 for any necessary pauses.

Digit Modify Table: Add Beginning Digits

(all CPCs) - Version 1.0 or higher

Specify the digit(s) that the system will add to the beginning of a dialed-digit string when the number is sent to the CO.

FF6 2 05 (01-50) 0002 Hold (up to 10 char.) Hold

Digit Modify Pattern No. 01-50

("OT" = One-Touch key)

Digits or Codes to be added to the beginning of a dialed number, including:
 Digits 0-9
 * and #
 OT-4 (for pause)
 OT-5 + 6 (for DTMF conversion)
 OT-5 + 9 (for itemized code) - NA USA
 OT-5 + (1-8) (for auth. code) - NA USA
default: (none)

- Enable ARS using the following address:

FF1 0 02 0010 Hold 1

ARS/LCR Setting

all CPCs, Version 1.0 or higher

Set whether Automatic Route Selection (ARS) will apply to outbound calls using the 1st-priority (MCO-1) trunk access code ("9" by default).

FF1 0 02 0010 Hold (0 or 1) Hold

0=ARS will not apply to MCO-1 access code (default)

1=ARS will apply to MCO-1 access code