Panasonic
Digital Business System
Overview

Contents

Introduction

The Digital Business System (DBS) range is a hybrid system allowing both digital key telephone and analogue telephone handsets.

There is a range of three cabinet sizes. DBS38 , DBS68 and DBS90. These can be used individually or combined with a second DBS90 to give a range of systems DBS38 , DBS68 , DBS90 , DBS128 (DBS90+DBS38) , DBS158 (DBS90+DBS68) and DBS180 (DBS90+DBS90).

The cabinets are supplied empty, except for the power supply, and are configured using modular cards and equipment options.

This section describes the port types and equipment for the DBS.

Important System Data

This is a class A product.
In a domestic environment this product may cause radio interference, in which case the user may be required to take appropriate measures.

This product has been CE marked to show compliance with the EMC Directive 89/336/EEC amended by 92./31/EEC and 93/68/EEC.

Port Types

Port Type	Permitted Connection
PAS	2 wire PSTN exchange line without DDI 2 wire PBX extension
requirements	Loop calling unguarded clearing, DTMF or LD signalling, timed break or earth recall.
1AS	2 wire analogue speech band equipment
requirements	DTMF or LD dialling, timed break recall E.g. SLT, cordless telephone, FAX, modem
ITS	Panasonic proprietary DBS digital keytelephone Panasonic digital Voice Announce Unit

Table 1 - Port Connections

Special And Optional Circuits Supported

Circuit Type	Circuit Use
Meter Pulse, 50 Hz	Call charge calculation
DC5, 2 wire + E&M	Private circuit link
ISDN 30 , DASS 2	ISDN network connection

Table 2 - Special & Optional Circuits

Port To Port Connections Permitted

The following port to port connections can be made.

Call Path	Call Path	Call Path	Call Path
PAS > ITS	ITS > ITS	ITS > PAS	1AS > 1AS
PAS > 1AS	ITS > 1AS	1AS > PAS	1AS > ITS

Table 3 - Call Paths

Port To Port Loss

The following table shows the maximum port to port and associated cable loss.

Port > Port	Port > Port Loss	Associated Cable Loss
PAS > 1AS	1.3 dB	0.7 dB
PAS > ITS		
ITS > 1AS		

Table 4 - Port To Port Loss

Relative Levels

The input and output relative levels for each port type are shown below. These values assume zero cable loss.

Port	Input (dBr)	Output (dBr)
PAS	-6	2.5
1AS	3.5	-7
ITS		

Table 5 - Relative Levels

Loudness Rating

The loudness rating for each port type is given below. (PTRP -   )

PTRP > ITS	0 dB	ITS > PTRP	2.5 dB
PTRP > 1AS		1AS > PTRP	
PTRP > PAS		PAS > PTRP	

Table 6 - Loudness Rating

Cabling Requirement

The cabling between the Central Control Unit (CCU) and each extension is 2 wire, 0.5mm diameter copper conductor and terminated with a Line Jack Unit (LJU). Use a master LJU for analogue extensions and a slave LJU for the digital extensions.

The following table shows the maximum cable length from the CCU.

Cabling from the Network Test and Termination Point (NTTP) must also comply with these requirements.

Cable	Maximum Loop Resistance	Maximum Length
CCU > ITS	40 ohms	240m
CCU > DSS	20 ohms	120m
CCU > 1AS (A version)	100 ohms	480m
CCU > 1AS (B version)	100 ohms	880m
CCU > PFU		250m
NTTP > CCU		15m

Table 7 - Maximum Cable Distances

Over-voltage Protection

Surge arresters are fitted to the PAS, ITS and 1AS ports of the system. If the extension cabling extends between buildings or runs around the outside of a building, surge arresters should be fitted at both exit and entry points.

PBX Recall

The DBS can be installed as a host or subsidiary system to suitably approved PBX equipment.

As a host the DBS will accept timed break recall signals from a PBX connected to a 1AS port.

As a subsidiary the DBS can provide both timed break and earth recall signalling to the host from PAS ports.

1AS Port Line Feeding

The DBS is not a through fed system. Line feeding from 1AS ports to connected equipment is derived internally from the DBS CCU. The maximum current that can be supplied to extension equipment on 1AS ports is 50mA.

Analogue Extensions

When using separately approved extension apparatus, Panasonic recommend DTMF signalling. The recall signalling must be timed break. The impedance class of the apparatus must be class (a) of clause 4.3.2.1 of BS6305:1982.

Call Path Delay

The maximum call path delay for each speech link is shown below. The times are in micro-seconds.

Call Path	Max. Delay	Call Path	Max. Delay
PAS > ITS	1000	ITS > PAS	1000
PAS > 1AS	875	1AS > PAS	875

Table 8 - Call Path Delay

Power Failure

If installed the batteries inside the CCU will back up the operation of the DBS for a short time. The precise time will depend upon system size and the volume of call traffic.

Alternatively an external battery may be added to increase the running time in the event of a power failure.

In addition a number of power fail telephone units (PFUs) can be connected. The CCU will divert the first few lines to these units if the power and battery backup fails. The number of PFUs varies according to the CCU used.

Interconnection Of Ports

Warning
Interconnection directly or by way of other apparatus, of ports marked in accordance with clause 5.2 of BS6301:1989 with ports marked or not so marked may produce hazardous conditions on the network. Advice should be obtained from a qualified engineer before such a connection is made.

SAFETY WARNING: See Instructions For Use !

The ports so marked do not provide isolation sufficient to satisfy BS6301. Apparatus connected to such ports should either have been approved to BS6301 or have previously been evaluated against British Telecommunications PLC, Technical Guides 2 or 26 and given permission to attach. Other usage will invalidate any approval given to the apparatus.

Prevention Of Access By The User

The DBS is intended to be accessible only to authorised personnel. There are no user accessible parts inside the equipment. Failure to prevent such user access will invalidate any approval given to this apparatus.

Simple Call Routing Mode

The DBS works only in Simple Call Routing Mode (SCRM). All PSTN ports can be configured for SCRM working. ITS and 1AS ports are associated with the SCRM PSTN ports.

Approved Features

The DBS has been approved for the use of the following facilities. This list includes exchange line related features only and does not include internal facilities.

- Direct exchange line access
- Group exchange line access
- Exchange line grouping
- Exchange line key access
- On hook dialling
- Handsfree conversation
- Speed (abbreviated) dialling
- Last number redial
- Saved number redial
- Auto answer by lifting a handset
- Call barring
- Call barring override
- Station lock
- Call duration display
- Trunk queuing

- Hold and transfer
- Music on hold
- Hold reminder
- Call pick up
- External conference
- Busy override
- Call hunting
- Meter pulse detection
- Remote programming
- DISA
- PBX and PSTN recall
- LD and DTMF dialling
- Least cost routing
- Headset connection
- Night transfer

The CPC-C Card for ISDN provides all the above facilities and adds the following

- DASSII Primary Rate ISDN
- Calling Line Identity On ISDN Lines

- Direct Dial In (144 Numbers)
- Call Charge Information On ISDN Lines

The CPC-EX card provides ISDN and E&M/AC15A networking along with the facilities above and the following

- Trunk To Trunk Conference
- External Call Forward
- DISA Break Out

- Trunk To Trunk Transfer
- Internal / External Ring Priority
- CLI Name Look Up

Any other usage will invalidate the approval of the apparatus if as a result it then ceases to comply with the standards against which approval was granted.

System Capacity And Specifications

		DBS 38	DBS 68	DBS 90	DBS 128	DBS 158	DBS 180
Exchange Line Ports		6	12	18	24	30	36
Extension Ports		24	48	64	88	112	128
Extension/Line Ports		6/8	6/8	6/8	6/8 + 6/8	6/8 + 6/8	6/8 + 6/8
Max.Key Telephones		32	56	72	104	128	144
Max.Analogue Tels.		24	48	64	96	120	136
Max. DSS Consoles		4	4	4	4	4	4
Exch/Extn Speech		Non-Blocking					
Conf Speech Paths		8					
Operator Positions		2					
Paging Groups		8					
Speed Dial	Personal	10					
	System	90 x 2					
	Digits	24					

Table 9 - System Capacity

		DBS 38	DBS 68	DBS 90	DBS 128	DBS 158	DBS 180
Power Consumption	Standby	170W	250W	320W	490W	570W	640W
	Maximum	216W	324W	444W	660W	768W	888W
Dimensions HxWxD		532x441x 210	532x554x 210	532x554x 210	DBS 90+38	DBS 90+68	DBS 90+90
Weight (Kg)		24	29.5	30.8	54.8	60.3	61.6

Table 10 - Size & Power Specifications

DBS Equipment Descriptions

This section contains a description of each component that can be used to build up a DBS system. Refer to the Installation Manual for details about installing these components.

DBS CCU (DBS 38 / DBS 68 / DBS 90)

Model Numbers: VB3357 / VB3557 / VB3657   Max. Per System: 2

The DBS CCU is the basis of the whole system, modular cards and power supplies are fitted to configure the system. A DBS 90 CCU can be doubled up with any one other CCU to configure larger systems. The CCU has a bank of slots for the installation of modular cards and a range of connection points for other optional equipment. The slots are divided into the following groups:

CPC	For the main system processor card
SCC	For the system control card
LINE	LINE slots can accept either an exchange line card or E&M card
EXT	EXT slots can accept either digital or analogue extension cards
EXT/LINE	or Universal slot can accept exchange line , E&M , ISDN , digital or analogue extension cards.
AUX	For DTMF receiver cards and system interconnection cables.

Connections are provided on the CCU for the following:

Exchange Lines	Music On Hold (MOH) source
Extensions	External Paging Adapter (EPA)
E&M Circuits	Earth connections
Power Fail Telephones	Doorphone Interface
SLT Ring Generator	-48v Power Supply
Backup Batteries	Call Logging Equipment (RS232C)

DBS 38 Built In Battery

Model Number: VB2450A2   Max. Per DBS38: 1

Batteries for use with the DBS 38 CCU to maintain system operation in the event of a power failure. It will hold system operation for approximately 30 minutes on a fully configured system. From discharged state it takes 15 hours charging to reach 80% fully charged.

DBS 68 / 90 Built In battery

Model Number: VB26502   Max. Per DBS68/90: 1

Batteries for use with the DBS 68 and 90 CCUs to maintain system operation in the event of a power failure. It will hold system operation for approximately 30 minutes on a fully configured DBS68 and 15 minutes for a fully configured DBS 90 system. From discharged state it takes 15 hours charging to reach 80% fully charged.

External Battery Cabinet And Battery

Model Number: VB2497 / VB24973PEX   Max. Per CCU: 1

With the internal batteries removed the external battery cabinet can be attached to the CCU. This is larger capacity battery than the internal option and will hold the system operation for approximately 4 hours on DBS 38 , 5 hours DBS 68 , 4 hours DBS 90 and 4 hours per cabinet on an double CCU system. When used on a double CCU system one external battery and cabinet is required to be installed for each CCU. From discharged state it takes 15 hours charging to reach 80% fully charged.

CPC-B Central Processor Card

Model Number: VB3775   Max. Per System: 1

The Central Processor Card (CPC) is installed in a the dedicated CPC slot within the CCU. It controls the system operation and holds the system software and engineer settings. It is a 68000 processor with the system program stored on EPROM and programmable options stored in battery backed RAM. The system clock is also on this card. The CPU on this card is in overall control of sub-CPUs on other system cards.

CPC-C Central Processor Card

Model Number: VB3775A   Max. Per System: 1

The CPC-C card performs the same function as the CPC-B card with the addition of DASSII ISDN connection supporting DDI, CLI and CCI. For a full feature description see the later section *'ISDN Interface'*

CPC-EX Centrel Procesor Card

Model Number: VB3776   Max. Per System: 1

The CPC-EX is a further enhanced CPC card replacing both CPC-B and C above on systems where both DASSII and analogue private networking are required. It also provides addition system features as described in the appropriate section later *'The CPC-EX Card'*.

SCC System Control Card

Model Number: VB3665   Max. Per System: 1

The System Control Card (SCC) is installed in the dedicated SCC slot next to the CPC. It provides tone generators for the system and controls external interfaces for music on hold , external paging , remote administration and call logging.

RAI Remote Administration Interface

Model Number: VB3666A   Max. Per System: 1

The Remote Administration Interface (RAI) is a plug in modem with 300 and 1200 bps transmission speeds, V.21/22 standard. It is mounted onto the SCC. The RAI allows engineer programming of the system from a remote location over an exchange line.

Exchange Line Card

Model Number: VB3660

Each exchange line card provides interfaces for 6 exchange lines. These are loop calling unguarded clearing lines with LD or DTMF signalling. Exchange line cards are installed in the LINE slots, but can also be installed in the universal slot. The maximum number which can be installed is dependant upon the CCU used.

Digital Extension Card

Model Number: VB3670

Each Digital Extension Card (DEC) provides 8 interface circuits for the connection of proprietary digital extensions. The card installed in the first EXT1 slot of the DBS must be a DEC. The remaining slots can be any mix of DEC or Analogue Extension Cards (AEC). The DEC can also be installed in the universal slot if required.

Analogue Extension Card

Model Number: VB3680

The Analogue Extension Card (AEC) provides a circuits for the connection of 8 analogue equipment approved to BS6305. This equipment must used timed break recall signalling. Dialling can be LD, however DTMF is recommended because not all features are accessible form LD Telephones. To support this card the SLT Ring Generator VB3687 must be installed and if DTMF telephones are used at least one DTMF Receiver Card VB3682. The AEC can be installed in any EXT slot except the first EXT1 slot of the DBS.

DTMF Receiver Card

Model Number: VB3682   Max. Per System: 1

The DTMF Receiver Card (MFR) provides 8 DTMF receiver circuits for use by analogue extensions and DISA calls.

SLT Ring Generator

Model Number: VB3687   Max. Per CCU: 1

The SLT Ring Generator provides ringing signals to analogue extensions. The ring signal is 50vAC into 500ohms or 80vAC into 10 kilo-ohms at 25Hz +/- 3 Hz.

Doorphone Interface

Model Number: VB3473

The Doorphone interface is used to link upto 2 doorphones and lock releases to the DBS. It is an externally mounted unit, which links into ports on the DBS.

Doorphones

Model Number: VL568G / VL582A   Max. Per VB3473: 2

The doorphones are connected to the doorphone interface. There is a small and large version.

Meter Pulse Detection Card

Model Number: VB3667   Max. Per Line: 1

The Meter Pulse Detection (MPD) card is a small daughter board installed into sockets on the exchange line cards. One MPD card is required for each line where meter pulses are used. The -48v Power Supply is required when MPD cards are used.

-48v Power Supply

Model Number: VB3697   Max. Per CCU: 1

The -48v Power Supply is used to provide the power for the MPD cards and E&M cards.

E&M Card

Model Number: VB3663   Max. Per DBS 38: 1
                                                             Max. Per Other CCU: 2

The E&M card provides three DC5 E&M circuit interfaces for use when linking the DBS to a private network. When installed the -48v Power Supply is required to power the E&M card. It can be installed into any LINE or universal slot except the first LINE1 in the DBS.

AC15A Card

Model Number: VB3673   Max. Per DBS38: 1
                                                  Max. Per Other CCU: 2

The AC15A card provides three AC15A private circuit interfaces for use when linking the DBS to a private network. The -48v Power Supply is *not* required to power the AC15A card. It can be installed into any LINE or universal slot except the first LINE1 in the DBS.

Proprietary Key Telephones

The following range of proprietary key telephone equipment is available for connection to digital extension ports.

VB3411	12 Line Key Standard Handset
VB3411DS	12 Line Key Handsfree Display Handset
VB3411LDS	12 Line Key Handsfree Large Display Handset
VB3611D	24 Line Key Display Handset
VB3611DS	24 Line Key Handsfree Display Handset
VB3011	O Line Key Handset
VB3631	Direct Station Selection (DSS) Console

With the introduction of the CPC-EX Processor Card the following new models were added provide feature enhancements.

VBD411	12 Line Key Standard Handset
VBD411DS	12 Line Key Handsfree Display Handset
VBD411LDS	12 Line Key Handsfree Large Display Handset
VBD611D	24 Line Key Display Handset
VBD611DS	24 Line Key Handsfree Display Handset
VBD631	Direct Station Selection (DSS) Console

ISDN Interface

The DASS II interface and associated equipment allows the connection of Primary Rate ISDN to the Digital Business System (DBS). A maximum of 30 digital channels can be connected to any of the DBS systems irrespective of the system size. Connection of the digital circuits will reduce the number of analogue lines which can be connected to the system. The tables in the installation manual show which combinations are valid. The maximum number of DASS channels plus analogue lines can never exceed 48.

DASS II Equipment List

DASS II TRK Card	VB3664UK
DASS II MDF	VB3688UK
CPC-C Card	VB3775AUK
Synchronisation Unit	VB3668UK

DASS II Features

The following features are supported by the DBS DASS II interface.

Category 1 & 2 Calls	
Direct Dial In	(DDI)
Call Charge Information	(CCI)
Calling Line Identity	(CLI including OLI & TLI)

DDI , CCI and CLI require rental of network services.

DASS II Features For Future Use

The following features are intended for inclusion in future developments. These are proposed features and their development in future products is not guaranteed.

Customer Controlled Diversion	Call Charge Rate Data
Customer Controlled Channel Busying	Customer Controlled Call Barring

DASS II Feature Descriptions

Category 1 & 2 Calls

All calls on the ISDN have a Service Indication Code (SIC code) to allow the network to determine the call type. The DBS will accept incoming calls with SIC codes 00H , 10H or 12H only other call types will be refused. Outgoing calls from the DBS use the SIC 10H.

Direct Dial In

The network can send the last digits of the number dialled by the caller to the DBS. This string can be 1 to 6 digits long dependant upon configuration and the network services being subscribed to by the user. The DBS will use these digits to route the call to a specific extension or group of extensions using a look up table.

Call Charge Indication

The call charge is sent to the DBS at the end of an outgoing call. This data can be printed on the call logger and/or optionally displayed on keysets with an LCD.

Calling Line Identity

The calling party's number or called party's number can be displayed on a keyset with an LCD. The Incoming CLI from a caller is called Originating Line Identification (OLI) and the number returned from the network from a called party is Terminating Line Identification (TLI).

DASS II Detailed Feature Descriptions

Where the DASS II features are different from the analogue equivalent the details are given below.

Channel Seizure

The DASS channels are analogous to exchange lines and the terms channel and line can be considered equivalent when discussing calls over ISDN. The method of selecting a DASS line is the same as for Analogue lines. The two line types can be mixed in line groups, but caution is required since the dialling method for each is slightly different. When a DASS line is seized the B channel is set so that incoming calls on the selected channel are rejected.

Dummy Dial Tone

When a channel is selected the DBS will send a dummy dial tone to the internal user. The tone stops when dialling starts. If no dialling is started during a specified time after seizure the channel is released and busy tone sent to the user.

Dialling

Dialled digits are stored in the DBS and compiled into a dial message. this is sent to the network when a send key (#) time-out expires. The send key can be assigned to an FF key. If no digits are sent busy tone is heard by the user.

The timer restarts after each digit is entered. The time-out can be set by programming.

The # key is used as the send key. Analogue extensions using LD dialling will have to wait for the time-out since they are unable to dial the send command. When dialling the first press of # will send the digits entered so far to the line. A second press will act as a DTMF # or account code terminator depending upon circumstances.

If digits are dialled after the send key is pressed they are stored by the DBS and sent as DTMF after the called party answers. When using a DASS II channel the speech path is not established until the called party answers.

Call Type

When a call is received the SIC showing its type and capacity required are checked by the DBS. Calls of a type which are not supported by the DBS are terminated.

DASS Incoming Ringing

Calls without DDI information will ring as if they were a standard analogue line. When A DDI call is received it will ring as per the DDI settings. If the system is not set to use DDI numbers and a DDI call is received it will ring as if it were a normal incoming call.

Direct Dial In

The DBS can connect calls directly to extensions using DDI information of 1 to 6 digits sent from the network. Up to 144 DDI numbers can be specified in a programming look up table to route calls to an extension or group of extensions. A maximum of 50 groups of 8 member extensions can be created via programming.

In the DDI look up table each DDI number can only be specified once and route to one extension or group. Extensions and groups can be the recipient of calls to multiple DDIs by assignment to these DDI numbers in the table.

An incoming DDI call has priority over other incoming call types at the destination extension, overriding DISA , private line and other incoming calls.

Delayed ringing does not operate with DDI calls.

Auto answer is always operative for DDI calls regardless of system settings.

DDI to Extensions

When a DDI call is routed to an extension hunting call forward and coverage groups will operate as normal.

A extension cannot receive a DDI call under the following conditions.

> Off hook
> While receiving another call
> While being used for programming
> The extension to which call forward has been set cannot receive a call
> While DND is set
> While absence message is set
> SLT overload (system cannot drive the ringer on any further SLTs)
> While holding an internal or non appearing line and the DDI is also non appearing
> While hunting is disabled

DDI to Groups

When a DDI call is routed to a group hunting call forward and coverage groups are not available and do not operate.

A extension in a group cannot receive a DDI call under the following conditions.

> Off hook
> While receiving another call
> While being used for programming
> The extension to which call forward has been set cannot receive a call
> While DND is set
> While absence message is set
> SLT overload (system cannot drive the ringer on any further SLTs)
> While holding an internal or non appearing line and the DDI is also non appearing

A group cannot receive a DDI call under the following conditions.

> All members are unable to receive the call
> The group is receiving another incoming DDI call which is not yet answered

Incoming DDI ringing is only sent once. If a receiving extension returns to idle after DDI ringing is sent it will not ring for the missed DDI call.

Auto Transfer / Terminate Of DDI Calls

When a DDI call cannot be routed to its destination, is unanswered or the DDI number is not recognised it will either be transferred to the operator or terminated depending upon system program setting.

Sending Of DDI Number On Outgoing Calls

The DDI number of a telephone can be sent to the network with outgoing calls to become CLI for the receiving party.

When a telephone has multiple DDI numbers assigned to it the DDI number sent is determined using the following rules.

> If the extension has its own DDI and is a DDI group member, extension DDI is sent

> If the extension has more than one individual DDI, the DDI look up table is scanned from 1 to 144 and the first DDI found for the extension is sent.

> If more than one DDI group numbers and no extension DDI us set, the DDI look up table is scanned from 1 to 144 and the first group DDI found for the extension is sent.

DASS II Called Party Busy

When the called party is busy the DBS can pass busy tone to the extension making the call or terminate the call and pass dummy busy tone to the extension. It is also possible to display the cause of the busy tone returned from the network on the LCD of a keyset. The action taken when a called party is busy is specified through programming.

Call Logging Output

The CLI and CCI data sent from the network is sent to the call logger. Condition codes for incoming and outgoing DASS II calls have been added to the call logging output.

CLI Display

When a call is received the first 16 digits of a callers number can be displayed on the first line of the LCD on a keyset. If CLI is not supplied by the network the channel number is displayed similar to the display when an analogue incoming call is received.

When making a call the first 15 digits of the recipient party's CLI can be displayed on the second line of the LCD on a keyset if supplied by the network. If this data is not supplied the dialled number is displayed as for analogue lines.

The number will not be displayed when the call is held, when the second line will display the line number as for an analogue call.

Confirming Charge Data.

The charge data for the most recent call can be displayed on the LCD of a keyset. When new CCI is received the previously stored value is replaced with the new one. This data is not backed up.

The totals provided by the DBS at the operator console are cumulative and are only cleared when the operator enters the command CONF #95 Ext No. *. See the DBS Operating Instructions for more detail.

DASS II Relationship With Existing Features

Call Barring

Call barring operates in the same way as analogue lines.

Least Cost Routing

The LCR function will operate on the DASS II channels. However the method of accessing the networks differ between the analogue and digital lines.

It is recommended that analogue line access be programmed as carrier 1 (NCC1) and DASS II access be programmed as carrier 2 (NCC2).

When 131 access is used the 131 is sent first with the PIN and caller number are sent after the network sends the acknowledged signal.

When 132 access is used , 132 and the caller number are sent at one time as a dial message.

Speed Dialling

Speed dial numbers should be stored in the usual way. When # is stored at the end of the SSD the DBS will regard this as the send character and send the dial message. When # is stored in the SSD before the end the DBS will send digits before the # as a dial message and those after as DTMF after answer. When # is not stored it can be dialled after the SSD command or the time-out can be allowed to run its course to send the dial message.

Speed dialling after answer will be sent as DTMF.

FLASH is treated in the same way as RECALL

Redial And Save Dial

When used during a DASS II channel the call is terminated, the channel cleared and dialling sent on the same channel. Settings for flash and auto pause are ignored.

Exchange Line Pause

A pause stored in an SSD before the send command is ignored. Following the send command the pause is inserted in the DTMF dialling at the stored location.

FLASH

Flash on a DASS II channel will terminate the current call and reserve the channel for another call whilst presenting the extension with dummy dial tone.

RECALL

The Recall function is not supported by DASS II. Therefore the RECALL key will have no effect unless set in programming to 'Release And Re-seize' in which case it operates as a FLASH.

Exchange Line Hold And Transfer

When making a DASS II call it cannot be held or transferred until the called party answers.

Hold function and hence transfer are not available until the call is answered and the speech path established. Before the speech path is established transfer, park hold, conference, privacy release and call waiting will not function.

When receiving an incoming DASS II call the speech path is established immediately.

Off Hook Signal

A normal incoming DASS II call will off hook signal in the same way as an analogue exchange line.

A DDI incoming call will not operate off hook signalling.

Other Restrictions When Using DASS II On DBS

The DBS does not accept calls from DTE
DTE cannot be connected to DBS
Network Address Extension (Sub-Addressing)is not supported
E&M (DC5) is not available when using the CPC-C DASS II card

Voice Announce Unit

Model Number: VB3632

The Voice Announce Unit (VAU) is an optional unit for use with the DBS. It is connected to digital extension ports. The VAU provides recorded messages to callers, then transfers them to another extension following the callers' DTMF dialled instructions.

Each Voice Announce Unit contains two answering circuits each can have a different message or messages recorded depending upon DIP switch settings. Each circuit is associated with one DEC port. Circuit 1 for port 1 and circuit 2 for port 2.

The recorded messages and programmed information have a battery backup which will hold the data for up to 5 days in the event of a power failure once the unit has been installed for 48 hours.

When the VAU detects a call, it answers and plays a recorded message. If the VAU is used to back up an operator, or group of people, a delay to answer can be inserted, this allows the original persons time to answer the call if they are available. Recall ringing will override the delay to answer timer and the call will be answered immediately.

In the event that a caller is using an LD/pulse dialling telephone, or the DTMF level is low, the VAU will automatically transfer the call to a predetermined extension.

Feature Enhancements With Software Versions 4.1 & ISDN 1.1

Version 4.1 , for E&M users, and ISDN 1.1 , for ISDN users provide the following feature enhancements over previous versions.

- Group Ringing
- Internal DTMF From Memories
- 180 Speed Dials To Extensions
- Call Forward Indicator Suppression
- Absence Message Entry Without DSS

- Trunk Port Naming
- Call Logging Indication Of Hold/Transfer
- Call Charging Range Increased
- ISDN DDI Group Name Display
- Menu For Forward No Answer On LDS

Group Ringing

The DBS can support upto 50 ringing groups of 8 members each, for ISDN DDI or analogue incoming lines.

Group ringing will operate for the following types of incoming call:

External Incoming
Internal Incoming
Transferred Calls
DISA Incoming
E&M Incoming

Incoming Line Name Assignment

Line ports on the DBS can be assigned an alphanumeric name of upto 16 characters. When a name is assigned it will be displayed instead of the 'INCOMING nn' message when a call is received. If the port is a DASS II channel with CLI in use the CLI will override the name display.

The line name will be displayed in the following circumstances:

Incoming call
Incoming call redirected by Call Forward
Incoming call redirected by Hunt Group
DDI incoming call (if CLI not used)
Delayed ringing of an incoming call
Prime Line

The line name will not be displayed under the following circumstances:

Transferred call
Hold Recall
DISA incoming
Call reversion
Transfer Recall
Call Back when free
After answer
Retrieved call from hold
Outgoing call
Held call
E&M calls
Call Logger will show the line number

In these cases the line number will be displayed instead.

Internal DTMF Dialling From System And Personal Speed Dials

It is now possible to send DTMF signals internally from System Speed Dials and Personal Speed Dials on the DBS. This will allow single key access to voicemail systems to be set up.

To do this the destination extension is stored, followed by a DTMF send key and the DTMF to send. The DTMF can include 1 - 9,0,*,# and REDIAL (pause). The DTMF tones are 250ms mark / 250ms space and the pause time is the voicemail pause timer introduced in v4.0.

When using a memory to send internal DTMF in this way the keypad of the extension is disabled until dialling is complete and if the extension is a display keyset the LCD is blank. The blank LCD will keep passwords secret.

When dialling the tones can be audible or silent dependant upon system program setting. If the memory is sent during a conversation the contents will be DTMF dialled over the speech.

Memories can be 'chained' together provided that the total length of the combined memories does not exceed 24 digits.

When an System Speed Dial is used in this manner it does not increment the System Speed Dial use counter which can be viewed from the operator extension, this counter is only for external calls.

The facility can also be used over an E&M link, in which case the DTMF is sent after E&M answer is received and any stored pause ignored.

This facility will operate to any extension. However if the extension is set to forward to voicemail it will not operate, thus avoiding a repeating loop to voicemail.

Call Logger Indication Of Held And Transferred Calls

The call logging output has been updated to show DASS II calls and calls which have been held or transferred.

The new condition codes are shown below:

Condition Code	Meaning
H	Call has been held and retrieved or recalled. The time field shows when the call was retrieved and the duration will shown how long it was held for. If the caller cleared when on hold the line number will be preceded by a '*'. Type of hold is not detected.
T	Call has been transferred or held and retrieved or recalled at some point. This will print at the end of the call where the start time is the time it was transferred or retrieved and the duration is the time since it was transferred or retrieved.
i	Incoming DASS II call
o	Outgoing DASS II call
Z	Incoming DASS II DDI call

180 System Speed Dial Availability

The new versions of software allow for the DBS to be configured for 2 x 90 SSD groups or 1 x 180 SSD group. This is set via programming and requires a power off/on reset to take effect. Changing this setting will not erase the contents of the SSDs.

The SSD numbering changes dependant upon the mode selected.

With 2 x 90   the SSD locations are numbered   00~89 in each group
With 1 x 180   the SSD locations are numbered   100~189,200~289

Call Charge Range Increased

For meter pulse detection call charging the allowable cost has been increased from 99.9p per unit to 999.9p per unit. The step controlling the charge remains otherwise unchanged.

Suppression Of Call Forward Indications

It is now possible to suppress the display of call forward indication from the second line of a keyset LCD and green LED indication on BLF keys, when an extension sets call forward. This is useful when many users will be setting forward to voicemail and do not want these indications present.

When suppressed the DND/CF LED on keysets will still be illuminated to indicate call forward status.

ISDN DDI Group Name Display

The DDI group name can be displayed on the second line of a keyset LCD when an incoming DASS II DDI call is received by a DDI group. This will clear after answer.

Group name will override CLI display.

Absence Message Entry Without A DSS Console

Absence messages can now be set by the operator extension using the keypad to enter the characters. Maximum message length is 15 digits.

Call Forward No Answer Setting From Menus On The VB3411LDS

Call forward no answer option is now available from the function menu of the large display keyset.

The CPC-EX Card

The CPC-EX card is an expanded and enhanced CPU card for the DBS. It replaces the CPC-B and CPC-C cards, combining the facilities of both and providing new facilities to further enhance the functionality of the DBS.

The CPC-EX can be fitted to any existing DBS system, directly replacing the CPC-B or -C card installed. The memory can be RAM transferred between CPC-B v3.2 or later and CPC-EX but not from CPC-C to CPC-EX, so full programming details must be recorded before upgrading a card where a manual system reprogram is required.

In conjunction with the CPC-EX there is a new range of handsets, which can directly replace the current range and offer expanded features over the previous models. The new handsets will only operate with the CPC-EX or later software, earlier handsets will still operate with CPC-EX.

The following new features are available with the CPC-EX.

⇒ DC5/AC15A & ISDN features on a single CPC card
⇒ Incoming ringing priority for internal or external calls
⇒ Internal call queuing at the operator
⇒ Call forward to an external number
⇒ Trunk to trunk transfer
⇒ Trunk to trunk conference
⇒ DISA break out
⇒ Expanded hunt groups to 24 groups of 32 extensions
⇒ Internal call cyclic hunting mode
⇒ Internal call ringing hunting mode
⇒ Support for 4 BLF DSS units
⇒ ISDN CLI lookup using SSD names
⇒ Support for new DBS handset range

The new handsets offer the following in addition to the current range.

⇒ Live keypad
⇒ Volume control for
       Incoming internal call ringing
       Incoming external call ringing
       Internal call monitor
       External call monitor
⇒ Off hook monitor
⇒ Handset mute
⇒ Large LED for ringing and message indication
⇒ LINE key
⇒ MIC key now an FF key function

The new extension model numbers are listed below in the section *'Proprietary Key Telephones'*.

CPC-EX - Euro ISDN

This update details the new facilities for the DBS provided with the CPC-EX version 2.

These facilities are:

- ☎ Euro ISDN
- ☎ Multiple ISDN pipes
- ☎ Alternative DDI Destination
- ☎ DDI Group Ring With Call Forward
- ☎ Ringing Hunting For External Calls
- ☎ Operator Call Forward All Calls
- ☎ Extension Feature Clear
- ☎ Programming Mode At Any Display Keyset

They are described below.

EURO ISDN And ISDN Feature Enhancements

The v2 software provides the ability to connect to either DASSII or Q.931 ISDN protocols. In addition a second digital trunk card may be fitted to double cabinet DBS systems to give a full 48 (maximum allowed by DBS) channels split over two digital 'pipes'. In this case both cards must be running the same ISDN protocol. Channels can be split as required between the two cards up to a maximum of 48.

Systems using DASSII will require a new DASII card with an additional Sync Unit connector in the master CCU The second unit can be the existing DASSII card or a new card with the additional connector. All Euro ISDN cards are equipped with the extra connection.

The Euro ISDN protocol supports Sub-addressing and 3.1Khz Audio calls in addition to the DDI and CLI facilities available with DASSII. Sub-addressing is a DISA like function over the digital network. Digits are dialled after the telephone number and these are passed to the receiving system and used to route the call internally. 3.1Khz Audio is a setting which allows calls requiring limited bandwidth (modem and fax calls) to only take up the minimum required bandwidth and not reserve system resources from calls which require the full channel bandwidth.

The DDI routing has been extended to include a follow on extension option for each DDI on the system with the call reverting to the operator if both destinations are unanswered for any reason.

Call Forward With Group Ringing

Call forward and group ringing are also modified so that extensions in ring groups can set call forward for personal (direct to the extension, not the group) calls and still ring for group calls which will bypass the call forward.

Ringing Hunting For External Calls

External calls can now be made to ring around a hunt group on no answer. Set up the hunt groups in the normal way, select circular or cyclic and set the member and group no answer timers to the required settings (16 seconds and 320 seconds give a good ringing cycle). Make the incoming calls ring to the first member extension and they will hunt until answered.
.

Operator Call Forward

The Operator Extension can set a call forward for all calls provided the night ring telephone is set to a port other than 1. If the port is covered by an extension card the system will detect its presence and in this case a Keyset must be installed, which will lose the ability to call forward; if the port is one that has no installed card associated with it the system will accept the setting and let the Operator call forward without disabling any other extension.

Extension Feature Clear

Users sometimes set a feature on their extension and forget which feature it is. By going off hook and entering 790 at the extension concerned all features set by the user will be cleared. Extension feature clear from the Operator Extension still operates as before.

Programming Mode From Any Display Keyset

Programming mode can be entered from any display, previously this function was a toggle to enable and disable programming, now it will immediately enable the Keyset when entered and disable any previously set Keyset.

CPC-EX - DBS DDI Enhancements

CPC-EX version 2.1 contains an range of enhancements to the DDI operation of the DBS combined with E-ISDN and DASSII. The new features are:

- ☎ Separate DDI table for Night Service
- ☎ Alternative DDI destinations in Day & Night modes for Busy or No Answer
- ☎ DDI Ring Group membership increased from 8 to 32 members
- ☎ DDI Hunt Group, DDI Ring Groups and extensions can be members
- ☎ DDI calls to the operator extension are now subject to overflow ringing

DDI Night Service Table

The DBS now includes a second DDI table for use in Night Service. The table duplicates the options available for Day Service and allows a separate DDI ringing scheme to be made operational out of hours.

Calls directed to the operator telephone will be re-routed to the Night Ring Telephone in Night Service.

When making calls the DDI sent to network will be the DDI from the table (Day or Night) in use at the time the call is made.

Alternative DDI Destination - Busy / No Answer

CPC-EX v2 introduced and alternative extension option to which a DDI call can be routed if the primary destination is busy. CPC-EX v2.1 enhances this option by allowing the alternative destination to be a group or extension.
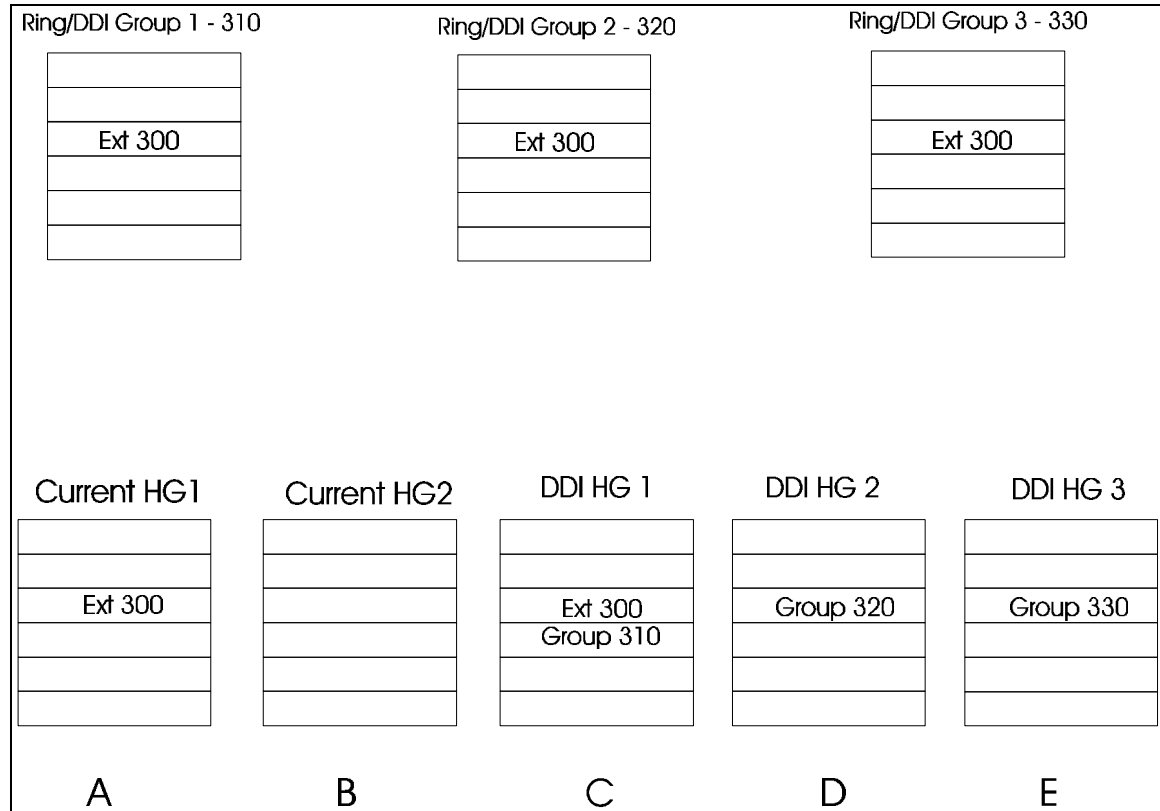
DDI Ring Group Membership

Membership of the DDI Ring Groups has been extended from the original 8 to 32 members.

DDI Hunt Group

A new Hunt Group type has been added to the software for the exclusive use of DDI calls. There are and additional 16 DDI Hunt Groups allowing 16 members of each. Members can be extensions or DDI Ring Groups, and the hunting mode is circular, with no answer or busy searching. No follow on group or alternative hunting modes are supported. The existing Hunt Group operation is unchanged

For DDI Ring Groups to be included in a Hunt Group they will require a virtual extension number to be assigned to reference them by. Extensions cannot be members of more than 1 DDI Hunt Group and cannot be included in a more than 1 Ring Group assigned to a DDI Hunt Group, but can be individually in the same DDI Hunt Group as a Ring Group in which it is also a member.

Group membership conditions for normal Hunt Groups are unchanged. (see following example)

Ring/DDI Group 1 - 310	Ring/DDI Group 2 - 320	Ring/DDI Group 3 - 330
Ext 300	Ext 300	Ext 300

Current HG1	Current HG2	DDI HG 1	DDI HG 2	DDI HG 3
Ext 300		Ext 300 Group 310	Group 320	Group 330
A	B	C	D	E

In this example:

a)   Cannot assign EXTN 300 to B, D and E
b)   Cannot assign GROUP 310 to A, B, D and E
c)   Cannot assign GROUP 320 to A, B, C and E
d)   Cannot assign GROUP 330 to A, B, C and D

The original Hunt Group hunting takes precedence over the DDI Hunt Groups. If there are calls to A and C and 300 becomes idle, the call on A will have priority over the call to C.

Tone And Lamp Indication

Tone/Lamp	Timing / Cadence	Remarks	Frequency
Internal Dial Tone	6 sec		425Hz +/- 10Hz -27 dBm
Busy Tone	6 sec		
System Busy Tone	6sec		
Internal Ring / Ring Back Tone	6 sec		
Internal Dial Tone With Confirmation	6sec		
Internal MOH Tone	6 sec		
Off Hook Signal / Call Waiting	6 sec		
Override Tone	6 sec		
Message Waiting	6sec	SLT Only	
Conference Tone	6 sec		
Incoming Ring	6 sec	In sync with line ringing.	From Line
Line Key In Use At Own Ext	6sec		
Line Key Busy At Other Ext / Group Key Busy	6sec		
Ringing - Other Ext	6sec		
Ringing - Own Ext	6sec		
Hold / Recall / Call Back / Transfer	6sec		

Legend: ☐ Tone   ■ Red LED   ▨ Green LED