STARPLUS®
DHS-L™

The Answer To Your

Company's Growing

Communication Needs

Technical Manual

VODAVI®
WE'RE TALKING TECHNOLOGY

STARPLUS®

DHS-L™

Key Telephone System

Technical Manual

Issue 2 - October 2001

Issue	Release Date	Changes
1	6-00	Initial product release.
2	10-01	Manual content has been updated, and contains major revisions.

LIFE SUPPORT APPLICATIONS POLICY

VODAVI Technology, Inc. products are not authorized for and should not be used within Life Support applications. Life Support systems are equipment intended to support or sustain life and whose failure to perform when properly used in accordance with instructions provided can be reasonably expected to result in significant personal injury or death.

VODAVI Technology, Inc. warranty is limited to replacement of defective components and does not cover injury to persons or property or other consequential damages.

SEH/2001

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1 Introduction

The information necessary to install, program, operate, and maintain the *STARPLUS®* *DHS-L™* systems is addressed in this manual.

Regulatory Information (U.S.A.)

The Federal Communications Commission (FCC) has established rules that allow the direct connection of the *DHS-L* systems to the telephone network. Certain actions must be undertaken or understood before the connection of customer-provided equipment is completed.

Table 1-1: FCC Compliance

Complies with Part 68, FCC Rules.	*DHS-L*
FCC Registration Number for PBX or hybrid operation (CO Line accessed by means of dial-access-codes or group/pooled CO line access)	D6XTAI-23279-MF-E
Ringer Equivalence Number (REN) or service code	1.1B
Type and USOC number of the interface jack to be ordered from the telephone company	RJ21X

Telephone Company Notification

Before connecting the *DHS-L* system to the telephone network, the local telephone company must be given advance notice of intention to use customer-provided equipment, and must be provided with the following information:

- Telephone numbers to be connected to the system
- *DHS-L* system information
- REN
- USOC jack required for direct interconnection with the telephone network (RJ11C)
- FCC Registration Numbers (Refer to *Table 1-1*)

Incidence of Harm

If the telephone company determines that the customer-provided equipment is faulty and possibly causing harm or interruption to the telephone network, it should be disconnected until repairs can be made. If this is not done, the telephone company may temporarily disconnect service.

Changes in Service

The local telephone company may make changes in its communications facilities or procedures. If these changes affect the use of the *DHS-L* system or compatibility with the network, the telephone company must give written notice to the user to allow uninterrupted service.

Maintenance Limitations

Maintenance on the *DHS-L* system must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. If unauthorized alterations or repairs are made, any remaining warranty and the software license for the system will be voided.

Hearing Aid Compatibility

All *DHS-L* digital terminals are Hearing Aid Compatible, as defined in Section 68.316 of Part 68 FCC Rules and Regulations.

UL/CSA Safety Compliance

The *DHS-L* system has met all safety requirements and was found in compliance with the Underwriters Laboratories (UL) 1459.

Notice of Compliance

The *DHS-L* system complies with rules regarding radiation and radio frequency emissions by Class A computing devices. In accordance with FCC Standard 15 (Subpart J), the following information must be supplied to the end user:

"This equipment generates and uses RF energy and if not installed and used in accordance with the Instruction Manual, may cause interference to Radio Communications. It has been tested and found to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of the FCC Rules, which are designed to provide reasonable protection against such interference, when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference."

Toll Fraud and DISA Disclaimer

"While this device is designed to be reasonably secure against intrusions from fraudulent callers, it is by no means invulnerable to fraud. Therefore, no express or implied warranty is made against such fraud including interconnection to the long distance network."

"While this device is designed to be reasonably secure against invasion of privacy, it is by no means invulnerable to such invasions. Therefore, no express or implied warranty is made against unlawful or unauthorized utilization which results in the invasion of one's right of privacy."

Vodavi has made every reasonable effort to ensure that this product works in most business environments. However, there may be some environments (RFI and EFI) in which this product may not work properly. In such cases, it is the responsibility of the installer to take the necessary actions to correct the situation.

Use of Station Lock Feature 97 will restrict access to 911. Also, use of certain music sources for BGM or MOH may violate copyright laws.

2 Description and Installation

The *STARPLUS DHS-L*™ Digital Hybrid System is a full-featured digital key telephone system. The common system architecture supports two digital telephone models, a Direct Station Selector and an expandable analog adaptor interface. *DHS-L* is designed to meet the telecommunications needs of small-to-medium sized business offices.

DHS-L General Description

System Technology

The *DHS-L* product line incorporates state of the art digital technology for voice switching and call processing utilizing Pulse Code Modulation and Time Division Multiplexing (PCM/TDM). The *DHS-L* family is engineered to allow migration of the *DHS-L* digital terminals and terminal accessories throughout the entire product line. ISDN-like, 2B+D technology complements the system architecture and capabilities. On one industry standard twisted pair, key telephones perform all system functions and voice communications. Some additional features of the *DHS-L* include:

- A non-blocking switch, with no loss or degradation of voice signals.
- Stored-Program Control (SPC), utilizing a 8-bit, 16 MHz microprocessor.
- Memory consists of 512 KB of Read Only Memory (ROM) and 256 KB of Random Access Memory (RAM).
- Battery Backed-Up RAM (128 KB)

When an analog device interface is required (and a DTIB-8 card is installed), a 2-Port Single Line Adapter (SLA) may be connected to any one digital station port. The 2B+D technology allows the *DHS-L* to split one digital key telephone port voice channel (B1) and the second voice channel (B2) to provide two independent SLT device interfaces.

The 2-Port SLA may be expanded with the 2-Port Analog Expansion (in the 2-Port CO Module housing). The 2-Port SLA and 2-Port Analog Expansion each require one dedicated digital station port.

The application of analog devices in the DHS-L has the effect of two-to-one port gain. For every single digital port used to interface a 2-Port SLA/Expansion, two analog ports are available.

The SLA only works on the DTIB-8.

System Components

KSU Components

The *DHS-L* platform is comprised of three key telephone models and a modular Key Service Unit (KSU) which houses the following KSU components:

- Main Processing Board (MPB) (required)
- Miscellaneous Interface Service Board (MISB) (required)
- 8- or 16-Circuit Digital Telephone Interface Board (DTIB-8 or 16)
- 16-Circuit Single Line Interface Board (SLIB)
- 16-Circuit Single Line Interface Board (SLIB) with Message Wait
- 8-Circuit Loop Start CO Line Board (LCOB)
- Power Supply

- 24-Channel T1 Digital Trunk Interface Board (T1IB)
- DTMF Receiver (mounts on MISB)

External Components

- Executive Key Telephone
- Enhanced Key Telephone
- 2-Port Analog Adapter
- 2-Port SLT Expansion
- Direct Station Selector (DSS)

Key telephones are available in two colors: Off White, and Charcoal Gray.

System Administration

The system default customer data base can be entered and changed, under password control, from any Executive Key Telephone. All Customer information is protected by an internal rechargeable NiMh battery. Programmable password protection is allowed for each station, system administrator and external (DISA) callers. An optional PC Programming Software is available to program the *DHS-L* system. This Software allows the user to program offline and then upload directly to the system. The *DHS-L* connects through the MPB to use the PC Programming Software.

Key Service Unit

The KSU is encased in metal with a removable front cover. The KSU dimensions are:

- Width: 21.6 in.
- Height: 18.1 in.
- Depth: 15 in.

Two large slots located on the back of the KSU are designed for wall mounting via a wall mount bracket. There are two screw slots located on the bottom, back of the cabinet also for aiding in wall mounting.

The cabinet was designed with convenient servicing in mind. The front cover of the cabinet can easily be removed using the key provided to unlock the securing latch mechanism. Once removed, all serviceable components are easily accessed (Refer to *Figure 2-1*). This includes the backplane, cards, card slots, station and trunk connections, ground connections, battery connections, power supply and fuses.

Figure 2-1: DHS-L KSU (cover removed)

The KSU contains all of the circuitry for system operation. The system's architecture is based on the universal slot concept, which allows a great deal of flexibility when planning the system configuration.

Cabinet Layout

The cabinet consists of two sections (refer to *Figure 2-1*):

- The three slots on the left side are reserved for the control cards.
  - The first control card slot is reserved for the MPB.
  - The second control card slot is reserved for the MISB.
  - The third control card slot is reserved for connection to a digital trunk: a T1 card (when connecting the system to T1 trunks).

The third control card slot can house a T1 card only. In configurations with no digital trunks (analog trunks only), this slot will remain empty.

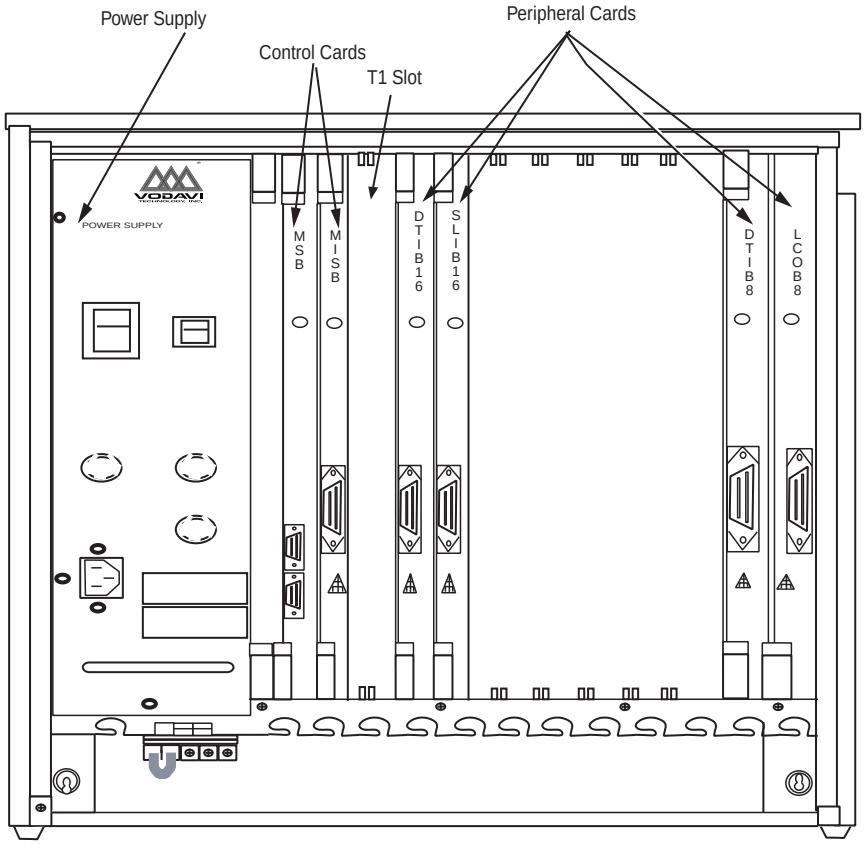


Figure 2-2: KSU Layout

- The rest of the nine slots, the universal slots, are reserved for peripheral cards, such as analog trunk and station cards supported by the system.

Power Supply

The system's power supply plugs into a dedicated circuit equipped with 117VAC +/-10%. The power supply receives single-phase main power (117 VAC at 60 Hz) and converts it to approximately 35 VDC for internal system usage, with 24 VDC battery backup interface.

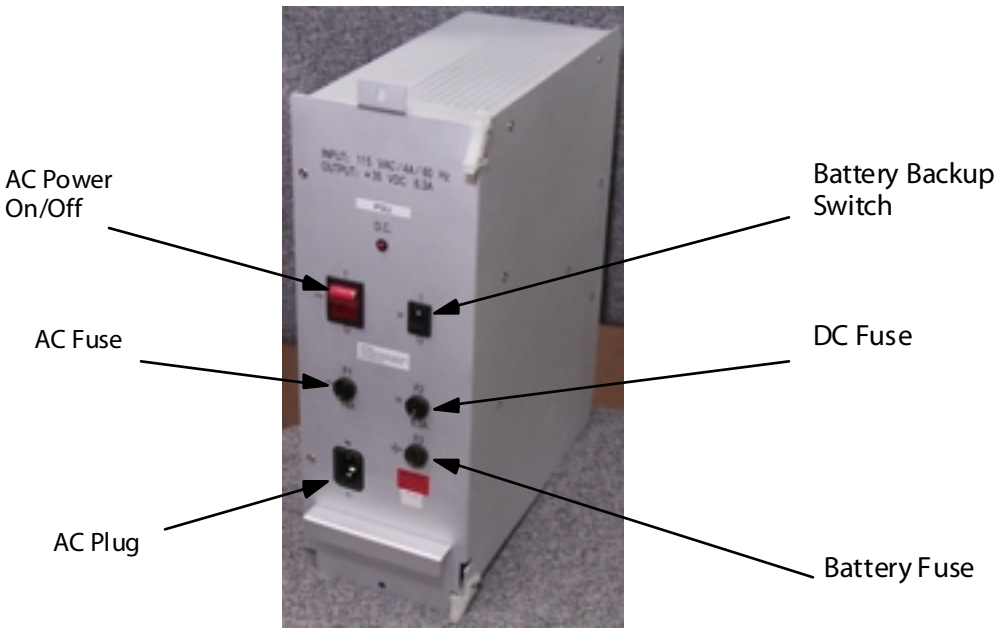


Figure 2-3: Power Supply

Three fuses, that can be accessed through the power supply front panel, provide protection to all internal system circuitry.

The KSU should be plugged into an isolated, grounded circuit.

Main Processing Board (MPB)

The MPB contains all of the necessary circuitry to operate the system. The MPB also contains the system memory and maintains a customer-related database in system RAM. All call processing and system maintenance are performed by the MPB. The MPB uses a standard straight-through cable.

Two RS-232 serial DB-9 connectors are positioned in the front of the MPB. The top connector, which is marked DBA, is used for connection to a personal computer with remote programming software and with ICLID. The bottom connector, marked SMDR, is used for connecting to a Station Message Detail Recording (SMDR) device. *Table 2-1* shows the RS-232 port connections.

Table 2-1: RS-232C DB-9 Connector

DCE	Male DB-9	Designation
K S U	1	DCD
	2	RX
	3	TX
	4	DTR
	5	GND
	6	DSR
	7	RTS
	8	CTS
	9	RI

The MPB is depicted in *Figure 2-4*; specifications are listed in *Table 2-2* :

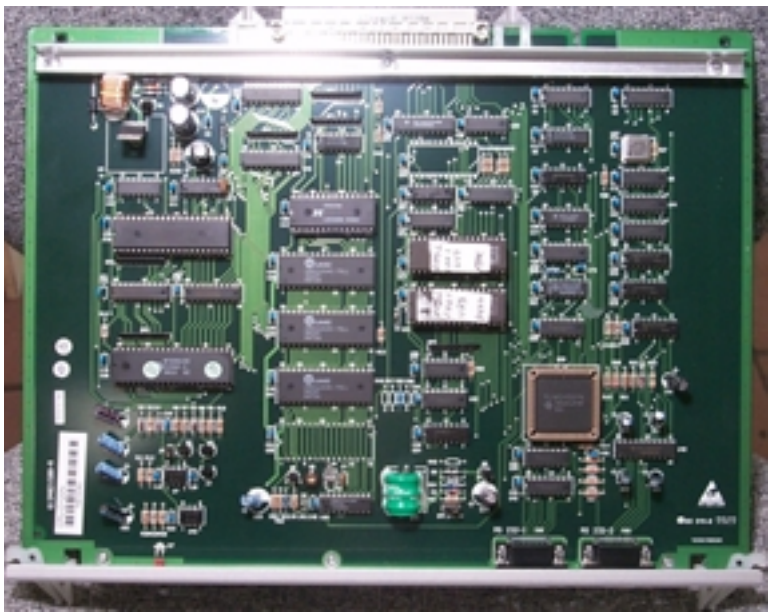


Figure 2-4: MPB

Table 2-2: MPB Specifications

Mircoprocessor	Intel 8088-2 Compatible at 16 MHz
System EPROM	512 KB
System RAM	256 KB
Battery-backed RAM	128 KB
Real Time Clock	Dallas Semiconductor DS1216D

A flashing LED located on the front panel of the MPB indicates normal system operation. When the LED is steady-ON, or -OFF, the MPB is likely malfunctioning.

Miscellaneous Service Board (MISB)

The MISB has the necessary circuitry required to perform conferencing, paging, tone and cadence generation, Music-On-Hold (MOH) and Background Music (BGM), internal melody generation, and multi-purpose dry relay contacts (specifications are listed in *Table 2-3*). The MISB generates all of the system cadences and audible call progress tones used by the system and stores the tones in EPROM using the mu-law (μ-law) method.

Table 2-3: MISB Function Specifications

Function	Specification	
Music Input (2)	Termination	Input Transformer (non-grounded)
	Impedance	600 Ω
	Input Level	-15 dB
Paging Output (2)	Termination	Input Transformer (non-grounded)
	Impedance	600Ω
	Output Level	-10 dB
Relay Contacts/Loud Bell (2)	Contact Type	Dry, Form A
	Max. Rated Voltage	50 VDC
	Max. Rated Current	1.0 Amp
	Max. Rated Power	30 VA

Figure 2-5 displays the MISB board.

Figure 2-5: MISB Layout

All connections to the MISB are made through a 24-pin champ amphenol-type connector on the front of the MISB.

The MISB can accommodate an optional piggyback DTMF receiver for an additional eight receivers and eight dial tone detectors for use in configurations containing many analog telephone ports. It also has a proprietary CMOS device which handles the conference clocking function of the system. The device contains eight identical circuits, each capable of conferencing up to four parties; it operates on an internal 8.192 MHz clock and outputs three frequencies used by the system: 2.048, 4.096, and 8.192 MHz.

The MISB has a red LED indicator that flashes to indicate that the card is functional.

Peripheral Cards

DTMF Receiver Board

The DTMF is a small card mounted as a piggyback on the MISB. The DTMF Receiver card contains 8 DTMF receivers and 8 dial tone detectors to provide additional resources to the system when needed.

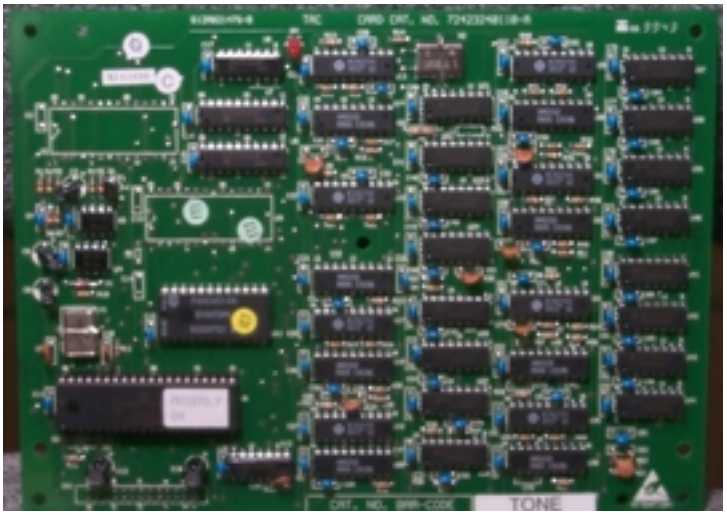


Figure 2-6: DTMF Receiver Board

T1IB Board

The T1 Interface Board (T1IB) provides the system interface to a T1 digital CO Line with 24 channels. The T1 includes a PLL (Phase Lock Loop) circuit and two DTMF receivers. The digital lines can be programmed as Loop, Ground, DID, E&M Wink, and E&M Immediate. The T1 has a 15-pin DB connector (DB-15) for connection to the MPB.

PINOUT

DHS-L		RJ-45 (CSU)
11	→	1
3	→	2
9	→	4
1	→	5

Figure 2-7: T1IB Board

LCOB-8 Board

8-Circuit Loop Start (LCOB-8) provides all outbound and inbound call supervision on the necessary circuitry for the connection of eight CO lines. The nominal impedance of each CO line circuit is 600 Ω. DTMF, dial pulse, or a combination of both may be used for outbound calls. Lines 1 and 2 of each LCOB-8 are connected to power-fail ports (on the RJ-21X block) during power outages. All connections to the LCOB-8 are made through a 24-pin champ amphenol-type connector.

Figure 2-8: LCOB-8 (8-Circuit Loop Start Board)

DTIB-8 Board

Each 8-Circuit Digital Interface Board (DTIB-8) supports up to 8 stations. Each station is connected to the DTIB-8 through a single twisted wire pair. A single 24-pin champ amphenol-type connector, located on the front panel of the card, provides the wiring to the card. If the SLA box is used, for each digital station, two-analog stations are available..

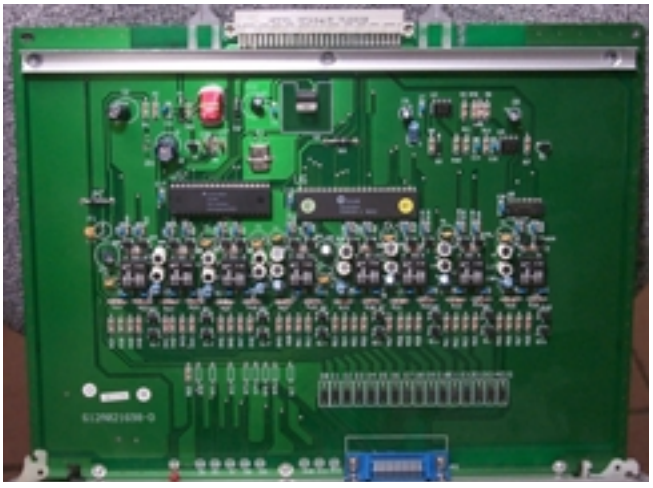


Figure 2-9: DTIB-8 (8-Circuit Digital Telephone Board)

DTIB-16 Board

Each 16-Circuit Digital Interface Board (DTIB-16) supports up to 16 stations. Each station is connected to the 16-Circuit Digital Telephone board through a single twisted wire pair. A single 36-pin champ amphenol-type connector, located on the front panel of the card, provides the wiring to the card.

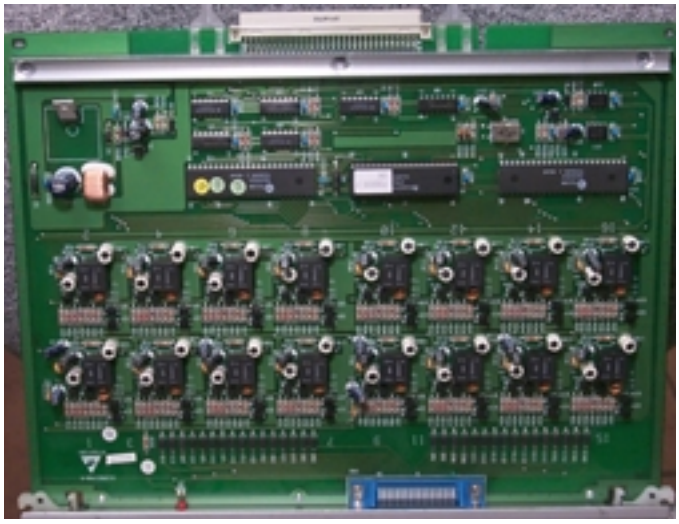


Figure 2-10: DTIB-16 (16-Circuit Digital Telephone Board)

SLIB-16 Board

The 16-Circuit SLT board supports up to 16 SLTs, both touch-tone and pulse dialing. Each station is connected to the 16-Circuit SLT Card using a single-twisted wire pair, and a single 36-pin champ amphenol-type connector located on the front panel of the card provides the wiring to the card.

Figure 2-11: SLIB-16 (16-Circuit SLT Board)

Digital Key Telephones

The *DHS-L* supports two proprietary digital key telephones (Enhanced and Executive). All key telephone models operate on one single twisted pair and provide D/A and A/D conversion at the terminal. These key telephones support hot key pad for dialing digits at any time.

Enhanced Key Telephone

The Enhanced Key Telephone is fully equipped for hands-free, speakerphone operation. This key telephone has a total of 28 buttons, eight buttons are for fixed functions.

Twenty buttons are user-programmable feature buttons equipped and dual color LED with pre-assigned default settings for quick power up operation. These buttons are arranged in five rows and four columns. Beginning at the top left button they are assigned the following default values; Station 201-212, CO line 764-769, HF/Tone and Message Waiting.

The Enhanced Key Telephone is also equipped with a 12-key Dial Pad for dialing intercom numbers, system feature codes, and telephone network numbers on CO lines.

Figure 2-12: Enhanced Key Telephone

Each telephone is equipped with an Additional Device Port (ADP) located on the underside of the phone for user-friendly connection of analog devices (answering machines, faxes, modems, cordless telephones, etc.). An analog adapter is required for this port to be equipped for use as an extension of the system.

Executive Key Telephone

The Executive Key Telephone model has a 2 x 16, 32-character Super Twist LCD display, with three interactive Soft Buttons to enhance system features operation.

The Super Twist LCD eliminates the need for contrast adjustment and enhances angled viewing position clarity of displayed data. A visual reference to call progress and call duration, as well as time and date information, is displayed. The display also enables the Executive Key Telephone user to send and receive visual advisory and callback messages.

The Executive model telephone is fully equipped for hands-free, speakerphone operation, and enables hands-free outgoing and incoming calls.

The same 20 Programmable Feature Buttons are available on the Executive model, as on the Enhanced model, with eight fixed function buttons.

Figure 2-13: Executive Key Telephone

Each telephone is equipped with an ADP located on the underside of the phone for user-friendly connection of analog devices (answering machines, faxes, modems, cordless phones, etc.). An analog adapter is required for this port to be equipped for use as an extension of the system.

Direct Station Selector (DSS) Console

A Direct Station Selector (DSS) Console is also available on the *DHS-L*. Four DSS Consoles may be assigned to a station. Each DSS Console uses one Digital Station Port.

The DSS Console buttons are programmed by the Station User using the FEAT + # + 4 command, then pressing the button on the DSS to be programmed.

Features are separated into two distinct categories for programming on a button: CO line or station.

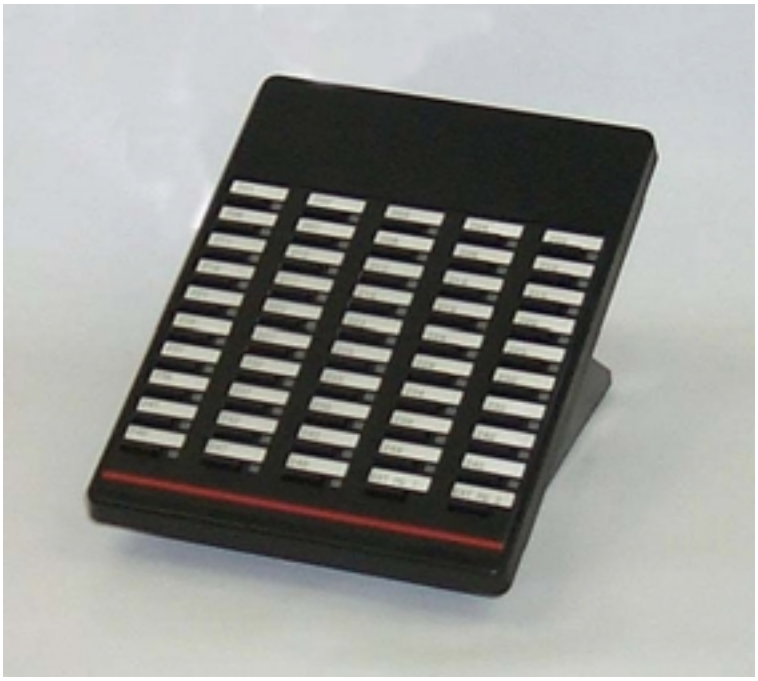


Figure 2-14: DSS Console

2-Port Analog Adapter

A 2-Port Analog Adapter is optionally available which will support most auxiliary equipment within a business environment such as fax machines, answering devices and Single Line Telephones (SLT). Each adapter requires an unused digital station port and will yield two analog device interfaces.

The 2-Port Analog Adapter is a wall mount apparatus that is powered from the KSU. The adapter receives both voice channels and data control from the KSU, over one pair of wires. The 2-Port Analog Adapter generates +30V DC and 20-25Hz, 50V square wave ringing for operation of SLTs, fax machines, answering devices, and most modems. All terminations are by RJ-11 connection.

When used with the DTIB-8 (only), the analog Adapter utilizes the B1 channel for voice tip/ring connection to one analog station, and the B2 channel for the other. D channel provides port control to and from the KSU. The adapter provides two DTMF receivers (one for each analog port).

Third party analog devices connected to the 2-Port Analog Adapter must generate DTMF signaling (Pulse/rotary dial telephones/equipment are not supported). The 2-Port Analog Adapter provides adequate housing space for one 2-Port Analog Expansion.

Loop disconnect and message waiting lamps are not supported by the analog adapter. DTIB-8 (2-1)

The Port Analog Adapter only is supported on the 8-port DTIB-8.

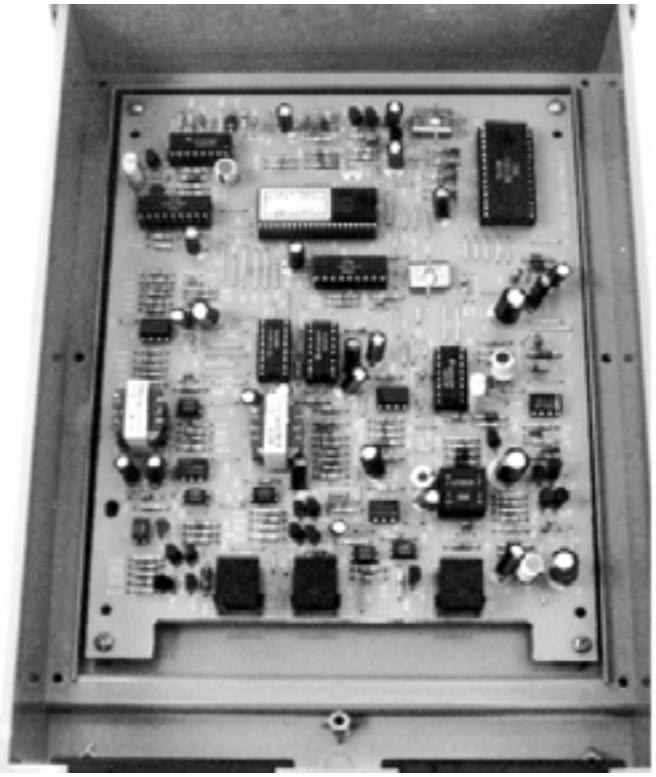


Figure 2-15: 2-Port Analog Adapter

Two-Port Analog Expander

A 2-Port Analog Expander module is optionally available and is designed to be installed inside the 2-Port Analog Adapter housing. The 2-Port Analog Expander provides the same interface capabilities of the 2-Port Analog Adapter and is in fact comprised of the same circuit board used inside the 2-Port Analog Adapter.

The 2-Port Analog Expander requires its own, dedicated digital DHS-L port for operation.

Loop disconnect and message waiting lamps are not supported by the analog adapter.

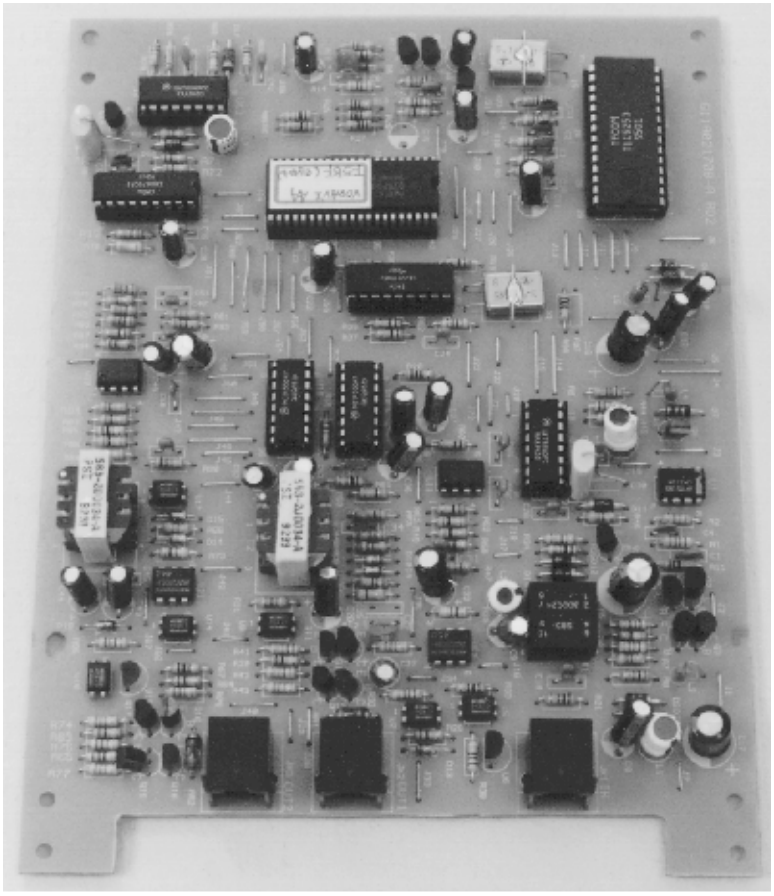


Figure 2-16: 2-Port Analog Expander

DHS-L Technical Specification Tables

Table 2-4: Digital Hybrid System Capacities

Component	Description
System Programming Memory Protection	300 Hours on a fully-charged battery (internal Nimh battery requires 14 continuous-powered hours of system operation to become fully charged.)
Ports: CO/PBX/Centrex Lines Digital Stations Standard SLTs 24 Digital COs DSS Consoles	 96 (Note: 0 stations max. with this configuration.) 144 (Note: 0 copper lines max. with this configuration.) 144 (Note: 0 digital stations max. with this configuration.) 24 Digital T1 channels 12 maximum
DTMF Receivers: LCOB 8 T1 DTMF	 2 (8 CO lines) 2 (24 channels) 8
DTMF Senders	Unlimited. (DTMF signal generation is derived from the core system tone resource. Tone combinations are available as needed.)
Tone Detectors (used to monitor call progress tones: Busy, Ring-back tones, etc.): LCOB 8 T1 DTMF Receiver Board	 2 (Shared for advanced call processing system features; DISA; ECF; ABR) 1 (Shared for advanced call processing system features; DISA; ECF; ABR) 8 (Shared for advanced call processing system features; DISA; ECF; ABR)
Contacts	2 LBC contact is available via the MISB.
Conference Circuits	Four-party conference circuits (8 per system).
DISA Circuits	Any number of CO lines may be programmed for DISA operation.
System Attendants	1 + 1 (6 tenants and 6 alternate tenants)

Table 2-4: Digital Hybrid System Capacities

Component	Description
Hunt Groups Members per Group Group Types	24 24 VA and UCD
Voice Mail Groups: Members (ports): Integration Method: VM Message Waiting: VM Control codes: Disconnect Digit(s): Prefix for intercom calls: Prefix for transferred calls: Record Digits for Voice Recorder function: Suffix for intercom calls: Suffix for transferred calls:	1 (Selected as VM type from HG) 24 (programmable under UCD groups) In-band [#] + [96] + station number to turn VM button LED on. [#] + [*] + [96] + station number to turn VM button LED off. 8 digits max. 4 digits max. 4 digits max. 4 max. 2 max. 2 max.
CO Line Loop Current Sensing	Interrupt programmable from 50 to 2500 ms
Paging	24 Internal Page Extension Groups 2 External Page Port (via MISB) 1 Internal All Call 1 System (Internal/External) All Call
Speed Dialing (ABBR) System Station (DKT and SLT)	(16 digits per bin; maximum speed dial bins = 1000) 100 50 per station
Last Number Redial	16 digits per station
Save Number Redial	16 digits per station
User Saved Number Redial	20 digits per station
Callback Request Per Station	1
Camp On By A Busy Station	1
Stations Camped On To Station	1
Stations Camped On To Busy Line	1
Message - Executive Notification	6 Preprogrammed; 1 Personal per station

Table 2-4: Digital Hybrid System Capacities

Component	Description
Message - Executive Preprogrammed	6 Preprogrammed; 1 Personal per station
Message Waiting	40 Simultaneous
Name in Display	1 Per station, 7 characters max.
Class Of Service (COS)	8 (0-7) per Day, 8 (0-7) per Night
Toll Restriction To/From Tables	100 Entries, 10 digits per entry
Forced Verified Account Codes	100 Bins, 8 digits max.
Unverified Account Codes	8 Digits max.
Call Pick Up Groups	8 Extension Groups
Station Lock Password	4 Digits max. per station
System Programming Password	8 Digits (########, default)
System Reminder Alarm	8 Time settings
Station Alarm	1 Per station
Ring Schemes	4
Distinctive Ring Tones	4 Per station; 4 Per CO
External Call Forward	1 incoming line, 1 outgoing line

Table 2-5: Electrical Specifications

Component	Description
AC Power Source	Dedicated 117/230V AC ± 15% (47-63 Hz single phase)
Power consumption	1.5A max. at 120V AC (180 W)
Power Supply fuse: Battery Charger AC input DC output	 4A 120V 6.3A 35V
Idle Channel Noise	-74 dBm
Cross Talk Attenuation	75 dB (at 1 kHz)
Ringing Sensitivity	40V RMS 25 Hz
Ringer Equivalence Number	1.1B
CO Line Signaling	DTMF amplitude (-5, -7 dB) +- 2 dB, at approx. 2 Vpp Pulse Dialing ratio 60/40 at 10 Pps
Music Source/Background Music	0 dBm at 600 ohm input impedance
Contact rating (MISB)	1A at 50V DC
External Page Ports	0 dBm at 600Ω
Serial Ports (COM)	Nine-pin female RS-232C

Table 2-6: Environmental Specifications

Requirements	In Operation	In Storage
Temperature KSU	32 to 104° F 0 to 40° C	-40 to 185° F -40 to 85° C
Recommended Operating Temperature	70 to 78° F	
Temperature Station Instruments	32 to 113° F 0 to 45° C	-40 to 185° F -40 to 85° C
Relative Humidity (non-condensing)	5 to 90%	5 to 90%
Heat Dissipation (BTU)	300	
Altitude	Up to 10,000 ft. (3,048 m)	Up to 40,000 ft. (12,192 m)

Table 2-7: Unit Specifications

Part #	Description	Dimensions			Weight
SP7000-20	Basic KSU	L W H	21.6 in. 18.1 in. 15 in.	460 mm 270 mm 105 mm	1300 Kg 51 lb
SP7030-00	MPB	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	0.82 Kg 1.85 lb
SP7035-00	MISB	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	0.82 Kg 1.85 lb
SP7032-00	DTIB16	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	0.82 Kg 1.85 lb
SP7032-08	DTIB8	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	0.82 Kg 1.85 lb
SP7033-16	SLIB16	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	1.1 Kg 2.4 lb
SP7033-00	SLIB-L	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	1.1 Kg 2.4 lb
SP7031-00	LCOB	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	1.1 Kg 2.4 lb
SP7031-31	T1IB	L W H	12.5 in. 9.5 in. 1.25 in.	318 mm 241 mm 32 mm	0.82 Kg 1.85 lb
SP7035-10	DTMF	L W H	7.8 in. 5.75 in. 0.5 in.	198 mm 146 mm 13 mm	0.3Kg 0.66 lb
SP7071-00	PSU	L W H	12.5 in. 9.5 in. 4.7 in.	318 mm 241 mm 120 mm	5.76Kg 12.7 lb
SP7310-XX*	DSS Console	L W H	8.88 in. 6.62 in. 1.75 in.	234 mm 168 mm 44.5 mm	1.2 Kg 2.64 lb
SP7314-XX*	Executive Key Telephone	L W H	9.36 in. 7.52 in. 2.58 in.	234 mm 188 mm 64.5 mm	1.2 Kg 2.64 lb

Table 2-7: Unit Specifications

Part #	Description	Dimensions			Weight
SP7312-XX*	Enhanced Key Telephone	L W H	9.36 in. 7.52 in. 2.58 in.	234 mm 188 mm 64.5 mm	1.2 Kg 2.64 lb

** XX Denotes color option: 71 = Charcoal, 08 = Off-White*

Table 2-8: Maximum Cable Length

Digital Key Telephone (Distance measures in linear ft. of cable from KSU to DKT.)	26 AWG - (850 ft) 255 m 24 AWG - (1416 ft) 425 m 22 AWG - (1983 ft) 700 m
Standard SLT (Distance measures in linear ft. of cable from KSU to SLT. 2-Port CO Module may be placed anywhere in between.)	26 AWG - (650 ft) 195 m 24 AWG - (1133 ft) 340 m 22 AWG - (1586 ft) 476 m

Table 2-9: Dialing Specifications

DTMF Dialing mode:	
Frequency deviation	± 1%
Rise time	3ms
Duration of DTMF signal	programmable 90-150ms (90ms default)
Inter-digit time	programmable 400-800ms (800ms default)
Pulse Dialing mode:	
Pulse dial rate	10 pulses per second
Pulse Make/Break ratio	60/40

Table 2-10: FCC Registration Numbers

For systems configured for hybrid operation (CO lines may be accessed by dial codes and Pool/Loop buttons).	D6XTAI-23279-MF-E

Table 2-11: Audible Signals

Signal	Frequency	Cadence
CO Line Ringing:		
Scheme 0	N/A	300 ms On, 400 ms Off, 300 ms On, 4 seconds Off
Scheme 1	N/A	300 ms On, 400 ms Off, 300 ms On, 5 seconds Off
Scheme 2	N/A	1 second On, 3 seconds Off
Scheme 3	N/A	1 second On, 2 seconds Off
Distinctive 1	SLT bell	Follows ring cadence of Ring Scheme selected
Distinctive 2		Follows ring cadence of Ring Scheme selected
Distinctive 3		Follows ring cadence of Ring Scheme selected
Distinctive 4		Follows ring cadence of Ring Scheme selected
SLT		Follows ring cadence of Ring Scheme selected
Intercom Ringing:		
Scheme 0	N/A	1 second On, 4 seconds Off
Scheme 1	N/A	1 second On, 5 seconds Off
Scheme 2	N/A	300 ms On, 400 ms Off, 300 ms On, 5 seconds Off
Scheme 3	N/A	300 ms On, 400 ms Off, 300 ms On, 2 seconds Off
Distinctive 1	SLT bell	Follows ring cadence of Ring Scheme selected
Distinctive 2		Follows ring cadence of Ring Scheme selected
Distinctive 3		Follows ring cadence of Ring Scheme selected
Distinctive 4		Follows ring cadence of Ring Scheme selected
SLT		Follows ring cadence of Ring Scheme selected
Message Wait Callback		Follows ring cadence of Ring Scheme selected

Preparation for DHS-L Installation

Installation Overview

1. Plan the installation, including the KSU and Main Distribution Frame (MDF) location, station locations, cable runs, and optional equipment.
2. Mount a backboard in the designated MDF location.
3. Mount the KSU on the MDF backboard. Use the provided mounting template to aid in spacing the mounting screws.
4. Install all PCBs inside the KSU as required.
5. Mount the MDF backboard, then attach the punch-down terminal block(s) to the backboard.
6. Run cables for the key telephone and single-line telephone locations from the MDF to each location. No cable should loop from one telephone location to another.
7. Run wiring to any optional equipment, such as external paging equipment, loud bell signaling devices, music sources, etc.
8. Route telephone and CO line port interface connections through the appropriate KSU opening, and terminate all industry standard wiring on punch-down terminal block(s) on the MDF.

9. Route auxiliary device cabling through the appropriate KSU opening and terminate as required (music source, printer/computer for SMDR, external paging equip., etc.).
10. Terminate station cables on punch-down terminal block(s) on the MDF.
11. Terminate station cables on modular jack assemblies at the station locations.
12. Cross-connect the CO lines and station ports to station cables on the corresponding punch-down terminal block.
13. Install the station instruments and any optional station equipment, such as headsets or SLTs.
14. Plug the AC power cord into the dedicated AC outlet and power up by operating the AC power switch to the ON position.
15. Observe the power/MPB heartbeat LED for flashing status after 4-6 sec.

General Site Considerations

The first step of *DHS-L* installation, is to locate an acceptable site for the common equipment (KSUs, boards, etc.). When locating a mounting site for the KSUs, the following points must be considered:

- KSUs are designed for wall mounting and should not be mounted directly to a masonry or plasterboard wall. It is recommended that 1/2 in. plywood backboard be firmly mounted to the wall, and the KSU and MDF be mounted to the backboard.
- The location must have access to a *dedicated* 117V AC (±10%), 60 Hz, single-phase circuit with a circuit breaker or fuse rated at 15 amps. A 3-wire parallel blade grounded outlet should be within approximately 6 feet of the lower left rear of the KSU mounting.
- The location must have access to a good earth ground, such as a metallic cold water pipe without non-metallic joints. The ground source should be located as close as possible to the system.
- The system should be located in an area that is well ventilated with a recommended temperature range of 68-78° F and a relative humidity range of 5-60% (non condensing).
- The system should be located within 25 ft. of the telephone company's termination point. Also, the location should be within the prescribed station loop lengths for all keysets and terminals. If existing cabling is used, its location and conduits should be considered. Station wiring should be in the building. Station ports are not designed for installation outside of the building.
- Protection from flooding, flammable materials, excessive dust and vibration.
- The site should be away from radio transmitting equipment, arc-welding devices, copying machines and other electrical equipment capable of generating electrical interferences.
- Operation of this equipment in a residential area is likely to cause interference. In which case the user, at his own expense, is required to take any necessary measures to correct the interference.

Necessary Tools and Supplies

To make installation easier, consult the following pages when preparing to install the system.

Tools

The following tools are recommended to install your *DHS-L* system. Others may be needed for certain troubleshooting procedures.

- ☐ Use unshielded, twisted multi-pair (three-pair minimum recommended) cable to run from the MDF to all station instruments (key telephone and single-line DTMF telephones). Digital key telephones only need one twisted pair to operate.

Use shielded cable if RFI/EFI is expected.

- ☐ Four conductor modular jack assemblies for all station instruments (recommended).
- ☐ Standard punch-down terminal block(s), 66M1-50 type, as required.
- ☐ AC voltage surge/spike protector.
- ☐ Standard telephone hand tools and mounting hardware for the KSU, MDF backboard, punch-down terminal block(s), modular jack assemblies for CO lines, etc.

Additional tools suggested to have on-hand when installing the *DHS-L* system include:

- ☐ 1 box 4 pair Cat3 or Cat5 twisted pair
- ☐ 25 pair Amp cables (male-female)
- ☐ 25 pair Cat3 cable
- ☐ 89B-Brackets
- ☐ B splice connectors or Scothlok™ splicing connectors
- ☐ Bridge clips
- ☐ Butt set (T.S. if possible)
- ☐ Chain for fishing walls
- ☐ Computer with RS232
- ☐ Cordless drill
- ☐ Diagonal wire cutters
- ☐ Digit grabber
- ☐ Drill
- ☐ Drywall screws
- ☐ Electrical tape
- ☐ Extension cord (three-prong with ground)
- ☐ Fiber rod for fishing walls
- ☐ Fish tape
- ☐ Harmonica adapter
- ☐ In-line adapter
- ☐ Ladder
- ☐ Level
- ☐ Linesmen scissors
- ☐ Long nose pliers
- ☐ M1-66 split blocks
- ☐ Modular crimping tool (RJ-11 and RJ-45)
- ☐ Multi-meter (fluke)
- ☐ Permanent marker (0.8 mm, 0.5 mm for certain applications)
- ☐ Phillips head screws:
  #1 x 4
  #2 x 4
  #2 x 6
- ☐ Phone jacks
- ☐ Punch Down Tool (110 and 66 Block Blades)
- ☐ RJ11 plugs
- ☐ RJ45 plugs
- ☐ Standard screwdrivers:
  1/8 x 4 in.
  1/4 x 4 in.
  3/16 x 6 in.
  5/32 x 4 in.
- ☐ Static/Ground Strap
- ☐ Toner
- ☐ Wand (Induction Amp)
- ☐ Wire spools
- ☐ Yellow 77 (lubricant for wire)

Verify On-Site Equipment

Once the equipment installation site is identified and a dedicated AC outlet, earth ground, adequate lighting and ventilation are available, verify that all equipment required is on-site and was not damaged during shipping:

- Unpacking the KSU - The Key Service Unit is shipped in its own protective carton and contains the following:

  Basic KSU

  One mounting template

  One System Installation & Maintenance Manual

  Open the carton and verify that all items are complete and undamaged. Remove all packing material and store for future use in the event that return shipment is required. This should be performed at the installer's office with a 48-hour burn-in period prior to installation.
- Check that the type and quantity of boards received is correct. DO NOT unpack the individual boards at this time.
- Verify optional equipment is received and is in good condition.
- Verify that a Power Line Surge Protector is on-site.

If any equipment is damaged or missing, notify the appropriate personnel to correct the situation.

DHS-L Installation

Backboard MDF Installation

A wooden backboard is recommended for all installations and must be installed when the location has masonry or plasterboard walls. A 1/2 in. plywood material is sufficient for most installations.

1. Mount the backboard at a convenient height, about 3 ft. above the floor. It can be bolted in various places to distribute the weight of the system.
2. Space should be available on the bottom side of the backboard for the MDF cabling and for optional equipment such as a music source and battery backup.
3. It is recommended that the location of each major item be roughly sketched on the backboard as an installation layout.
4. Locate the Telco-provided CO/Centrex lines at the demarc and extend them to the MDF location.

KSU Grounding

To ensure that the system will operate properly, a good earth ground is recommended. The Telco protector ground terminal or a metallic COLD water pipe will usually provide a reliable ground path. If cold water pipe is used, carefully check that the pipe does not contain insulated joints that could isolate the ground.

In the absence of the cold water pipe, a ground rod or other source may be used. A No. 8 AWG copper wire should be used between the ground source and the KSU.

The ground wire should be kept as short as possible and can be connected to the ground lug located on the bottom of the KSU. Check your local grounding regulations before installing the ground wire.

Voltage Surge/Spike Protection

To reduce the effects of AC voltage surges and spikes that may cause system malfunctions, false logic, and/or damage to the electronic components, it is recommended that a separately sourced surge/spike protector be installed. Check the manufacturer's specifications to ensure that the device meets the following requirements:

- The power cord should not be used with a 3-wire to 2-wire plug adapter.
- A power line surge protector should be used to protect the power supply from electrical surges. The surge protector should be installed in accordance with the manufacturer's instructions and applicable local electrical codes.
- Clamp voltage transients at 300V within 5 nsec. when exposed to wave-forms as described in the ANSI/IEEE Standard C62.41-1980 (IEEE 587).
- Reduce RFI/EMI noise by at least 20 dB at frequencies between 5 kHz and 30 MHz.

Battery Backup - System

External batteries may be connected to the KSU via screw terminals on the lower left area of the KSU cabinet. In the event of a commercial power outage, the backup battery will provide the necessary system voltage (24V +/-10%, 10A per hour) to allow full feature key telephone operation until AC power is restored or the battery voltage reaches minimum voltage thresholds and is automatically disconnected to avoid battery damage. It is recommended that the battery pack be connected to the power screw terminals with wire gauged at no less than 14 AWG. The pack must be located within 20 ft. of the KSU. The amount of system battery operation time is dependent on several factors:

- Number and type of key telephones installed
- System traffic load
- Age of external batteries
- Equipment Room Temperature
- Amp/Hour rating of external batteries
- Recovery time since last AC power interruption

Cautionary Steps

To reduce the risk of fire or injury to persons, read and follow these tips:

- Use only the following type and size battery(ies) listed here as the maximum battery type and size: 24vdc, 40 AH.
- Do not dispose of any battery(ies) in a fire, the cell may explode. Check with local codes for possible special disposal instructions.
- Do not open or mutilate the battery(ies). Released electrolyte is corrosive and may cause damage to the eyes or skin. It may be toxic if swallowed.
- Exercise care in handling batteries in order not to short the battery with conducting materials such as rings, bracelets, and keys. The battery or conductor may overheat and cause burns.
- Charge the battery(ies) provided with or identified for use with this product only in accordance with the instructions and limitations specified in this manual.
- Observe proper polarity orientation between the battery(ies) and battery charger.
- Do not mix old and new batteries in this product (applies to products employing more than one user replaceable secondary battery).
- Do not mix batteries of different sizes or from different manufacturers in this product (applies to products employing more than one user-replaceable, secondary battery).

KSU Installation

The KSU is designed for wall mounting only. The KSU should NOT be mounted directly on a masonry surface. If the KSU is to be mounted on a masonry surface, a wooden backboard of sufficient size should be attached to the wall and the KSU mounted on the backboard.

1. Using the mounting template as a guide, mark the 2 mounting screws locations on the MDF backboard.
2. Predrill 2 screw holes and install 2 pan-head No. 10 screws into the backboard. The screw heads should protrude about 1/4-in. from the backboard plywood surface.
3. Lift the KSU over the 2 screws allowing the screws to extend into the KSU slotted mounting holes. As the KSU is allowed to rest in place on the mounting screws it will slip over the screw shanks until the top of the slot is reached. Properly installed, the KSU power transformer (where the KSU AC power cord is located) is positioned in the upper left corner. The power switch and Power/Heartbeat LED are positioned at the left side of the KSU toward the bottom.

It is very important that the KSU be correctly mounted to allow proper power supply heat dissipation.

MPB Installation

The MPB has two 9-pin female RS232C connectors on it. The top connector is for programming and ICLID. The bottom connector is designated for SMDR output. *Figure 2-17* depicts the MPB Layout.

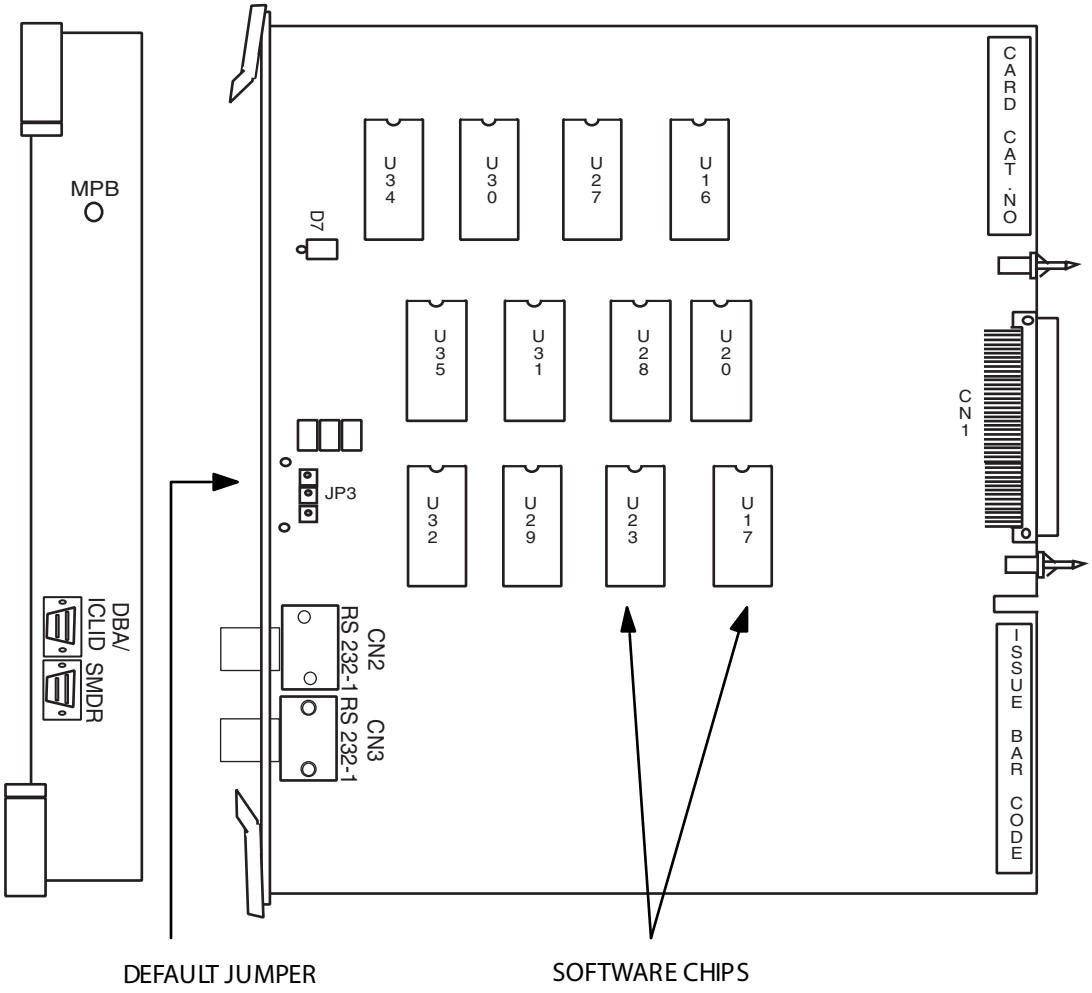


Figure 2-17: MPB Layout

MISB Installation

The MISB has a 24-pin champ amphenol-type connector on it. Each connector should be cabled to a dedicated cross-connect block. *Figure 2-18* displays the MISB Layout.

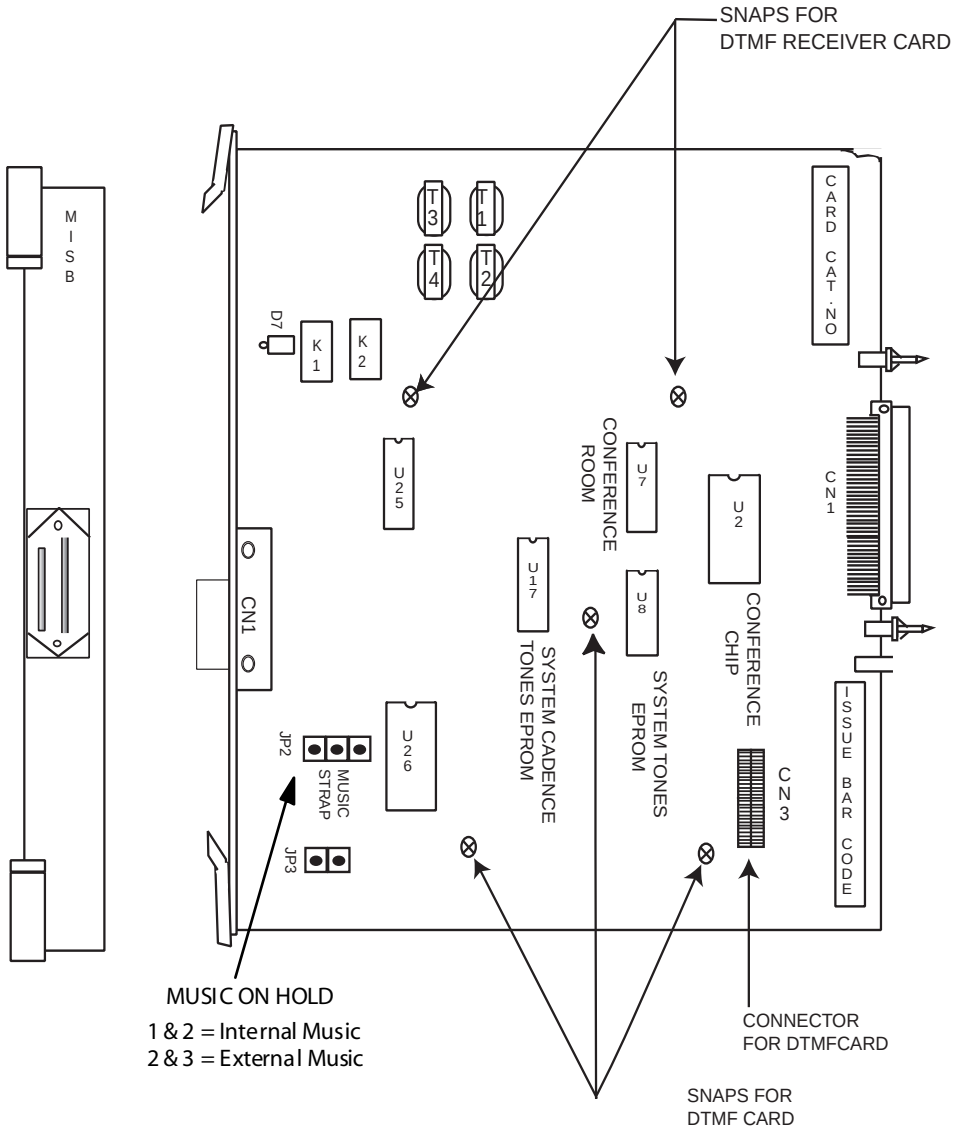


Figure 2-18: MISB Layout

1. To connect the trunks to the KSU, refer to the cross-connect wiring diagram in *Figure 2-19* which shows the wiring arrangement for the 24-pin champ amphenol-type connector that mates with the connector located on each trunk.

Port	PIN #	Color
MUSIC 1 801	13 1	WH/BL BL/WH
MUSIC 2 802	14 2	WH/OR OR/WH
PAGE 1 820	15 3	WH/GN GN/WH
	16 4	WH/BN BN/WH
PAGE 2 821	17 5	WH/SL SL/WH
	18 6	RD/BL BL/RD
Bell 1 810	19 7	RD/OR OR/RD
	20 8	RD/GN GN/RD
Bell 2 811	21 9	RD/BN BN/RD
	22 10	RD/SL SL/RD
not used	23 11	BK/BL BL/BK
not used	24 12	BK/OR OR/BK

Figure 2-19: MISB Cut Sheet

2. Install the cross-connect block to the right of the KSU allowing sufficient room to access both sides of the block. There should be sufficient room between the bottom of the card cage and the bottom of the KSU to route the cables.
3. Route cable up through the center of the cross-connect block, dress and secure the cable at several points, and then punch down the leads using a standard color code.

DTMF Receiver Card Installation

The DTMF Receiver Card is a daughter card that snaps into the MISB, and connects to CN3 as shown in *Figure 2-18* .

T1 Interface Board Card

The T1IB provides the T-1 (1.544Mbps, 24-Voice Channel) digital interface circuit, control circuitry, and synchronous clock control circuits. It has a 15-pin connector (refer to *Figure 2-20*).

System 1	System 2
DB15 Female Pin #	
1 --->	<--- 3
9 --->	<--- 11
3 --->	<--- 1
11--->	<--- 9

PINOUT	
DHS-L	**RJ-45 (CSU)**
11 --->	<--- 1
3 --->	<--- 2
9 --->	<--- 4
1 --->	<--- 5

Figure 2-20: Point-To-Point T1 Connection

.

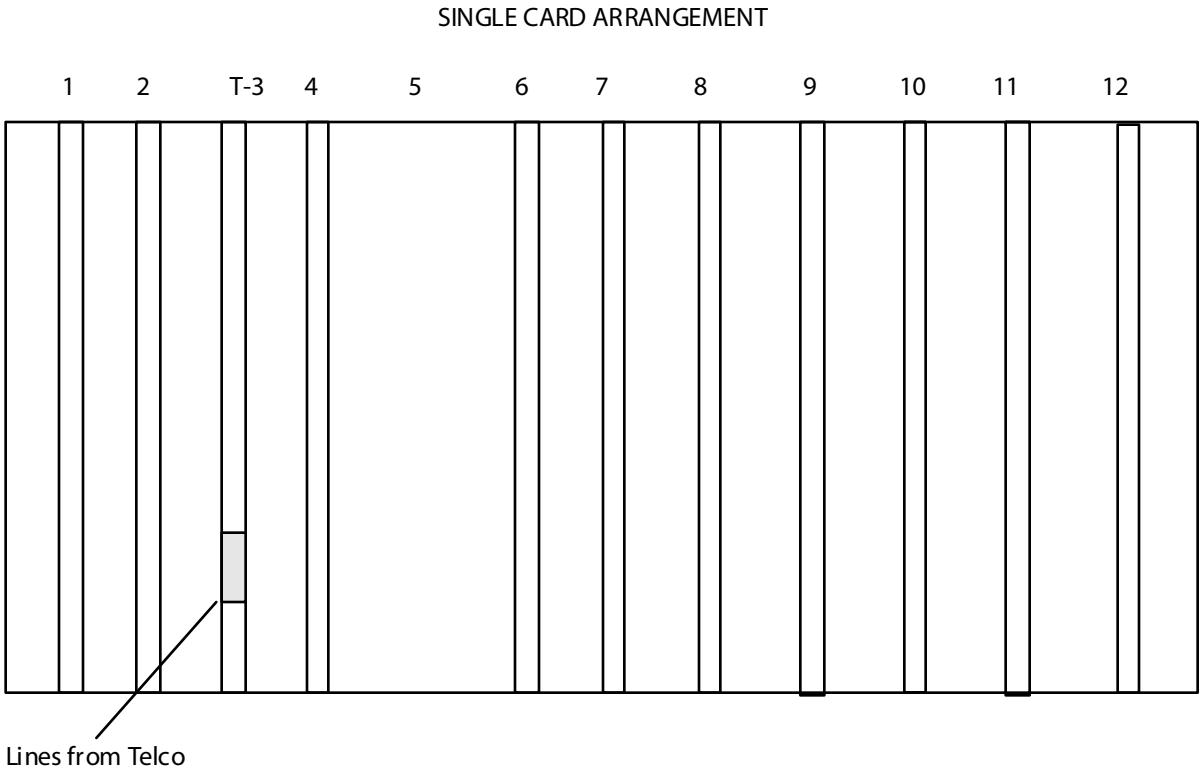


Figure 2-21: T-1 Single Card Connection

DTIB-8/16

There is one 24 or 36-pin female amphenol connector labeled CONN3 located on the front of the card. This allows the system to be cabled to the main distribution frame (MDF). Pair telephone cabling must be prepared with mating connectors to extend the inter-face circuits to the MDF. The cables should be routed through the cable clamps at the bottom of the KSU to the MDF. These cables are then terminated on industry standard 66M1-50 type punchdown connector blocks.

It is recommended that 66M1-50 split blocks with bridging clips be used to simplify troubleshooting and to isolate faults.

Port	Station	PIN #	Color	PIN #
1	201	19 1	WH/BL BL/WH	13 1
2	202	20 2	WH/OR OR/WH	14 2
3	203	21 3	WH/GN GN/WH	15 3
4	204	22 4	WH/BN BN/WH	16 4
5	205	23 5	WH/SL SL/WH	17 5
6	206	24 6	RD/BL BL/RD	18 6
7	207	25 7	RD/OR OR/RD	19 7
8	208	26 8	RD/GN GN/RD	20 8
9	301	27 9	RD/BN BN/RD	
10	302	28 10	RD/SL SL/RD	
11	303	29 11	BK/BL BL/BK	
12	304	30 12	BK/OR OR/BK	
13	305	31 13	BK/GN GN/BK	
14	306	32 14	BK/BN BN/BK	
15	307	33 15	BK/SL SL/BK	
16	308	34 16	YL/BL BL/YL	
not used	309	35 17	BK/SL SL/BK	
not used	310	36 18	YL/BL BL/YL	

Figure 2-22: DTIB-8/16 Wiring

SLIB Wiring

This board provides the interface to sixteen (16) 2500-type telephones. The SLIB signals interface with mechanical 90V ringers. The SLIB board has one LED indicator for status. The SLIB may be inserted or removed from the system while under power. The station connections are via one (1) 36-pin female (amphenol type) connector located on the front edge of the card.

Port	Station	PIN #	Color	PIN #
1	201	19 1	WH/BL BL/WH	13 1
2	202	20 2	WH/OR OR/WH	14 2
3	203	21 3	WH/GN GN/WH	15 3
4	204	22 4	WH/BN BN/WH	16 4
5	205	23 5	WH/SL SL/WH	17 5
6	206	24 6	RD/BL BL/RD	18 6
7	207	25 7	RD/OR OR/RD	19 7
8	208	26 8	RD/GN GN/RD	20 8
9	301	27 9	RD/BN BN/RD	
10	302	28 10	RD/SL SL/RD	
11	303	29 11	BK/BL BL/BK	
12	304	30 12	BK/OR OR/BK	
13	305	31 13	BK/GN GN/BK	
14	306	32 14	BK/BN BN/BK	
15	307	33 15	BK/SL SL/BK	
16	308	34 16	YL/BL BL/YL	
not used	309	35 17	BK/SL SL/BK	
not used	310	36 18	YL/BL BL/YL	

Figure 2-23: SLIB Wiring

LCOB Wiring

The Loop Start CO Interface Board supports up to 8 CO lines. The LCOB board has one LED indicator for status. The LCOB may inserted or removed from the system while under power. The CO connections are via one (1) 24-pin female (amphenol type) connector located on the front edge of the card.

Port	PIN #	Color
1	13 1	WH/BL BL/WH
2	14 2	WH/OR OR/WH
3	15 3	WH/GN GN/WH
4	16 4	WH/BN BN/WH
5	17 5	WH/SL SL/WH
6	18 6	RD/BL BL/RD
7	19 7	RD/OR OR/RD
8	20 8	RD/GN GN/RD
Power Failure (Line 1)	21 9	--
Power Failure (Line 2)	22 10	
not used	23 11	
not used	24 12	

Figure 2-24: LCOB Wiring

Station Cabling

Floor plans should be developed to aid in proper station cabling in a home run configuration from the KSU. The cables are run from the station locations to the MDF.

Twisted-pair station cable is required for all telephone connections to the KSU. Category 3 (or equivalent) cables may be used to connect telephones to the KSU. Both ends of each cable should be labeled with the station's circuit number. The circuit number designates the station port position in the KSU. It is recommended that #24 AWG station cable be used for station connections. Refer to *Table 2-12* for default Station directory numbers.

Table 2-12: Default Station Directory Numbers

Card Type				Slot Number								
Port	**B**	**DST1 AST1**	**DST2 AST2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	B1	X	X	201	209	217	225	233	241	249	257	265
2	B1	X	X	202	210	218	226	234	242	250	258	266
3	B1	X	X	203	211	219	227	235	243	251	259	267
4	B1	X	X	204	212	220	228	236	244	252	260	268
5	B1	X	X	205	213	221	229	237	245	253	261	269
6	B1	X	X	206	214	222	230	238	246	254	262	270
7	B1	X	X	207	215	223	231	239	247	255	263	271
8	B1	X	X	208	216	224	232	240	248	256	264	272
9	B2		X	301	309	317	325	333	341	349	357	365
10	B2		X	302	310	318	326	334	342	350	358	366
11	B2		X	303	311	319	327	335	343	351	359	367
12	B2		X	304	312	320	328	336	344	352	360	368
13	B2		X	305	313	321	329	337	345	353	361	369
14	B2		X	306	314	322	330	338	346	354	362	370
15	B2		X	307	315	323	331	339	347	355	363	371
16	B2		X	308	316	324	332	340	348	356	364	372

This table represents the FIXED station numbering plan. Each station number can be relocated in Programming.

Table 2-13: Default CO Trunk Directory Numbers

Slot >>> / Port	3	4	5	6	7	8	9	10	11	12
1	-- For T1IB -- Ports 1-24 Ext. 772-795	700	708	716	724	732	740	748	756	764
2		701	709	717	725	733	741	749	757	765
3		702	710	718	726	734	742	750	758	766
4		703	711	719	727	735	743	751	759	767
5		704	712	720	728	736	744	752	760	768
6		705	713	721	729	737	745	753	761	769
7		706	714	722	730	738	746	754	762	770
8		707	715	723	731	739	747	755	763	771

Running Cable

From the MDF location, run unshielded Category 3 (or equivalent) twisted cable to all key telephone locations and DTMF single-line telephone locations.

Use shielded cable if RFI/EFI is expected.

Follow these guidelines:

- Install proper type cable for the application according to the National Electrical Code and local building codes.
- Avoid cable runs parallel to fluorescent light fixtures or AC lines not in conduit. If these obstacles are unavoidable, run the cables across them at right angles.
- Do not run station cables inside electrical conduit already occupied by AC wiring. (To do so is a violation of the National Electrical Code).
- Do not run station cables near equipment with electric motors or through strong magnetic fields, such as those generated by large copy machines, arc welding equipment, heavy motors, etc.
- Do not place station cables where they can be stepped on or where they can be rolled over by office furniture.
- If using multi-pair (25-pair) cable runs to multiple station locations do not include AC ringing single-line sets, AC-ringing auxiliary equipment, or CO lines in a cable being used for key telephones. Key telephones should always be isolated in separate dedicated cable runs.
- Do not exceed the measurements for the station cable lengths (using 26AWG wire) listed in *Table 2-8: Maximum Cable Length*.

It is recommended that a minimum of 3-pair cable and a minimum of 4-conductor modular jacks be used for all station connections.

Terminating Cables at Station Locations

Terminate key telephones and DTMF single-line telephone cables on four conductor modular jack assemblies at each station location. Four conductors provide two pair-wired to the telephone. Although only one pair is required for key telephone operation, the second pair is wired through to the ADP jack for a variety of applications at the desktop. For exception, refer to *Table 2-14*.

Table 2-14: Station Location Cable Terminations

Cable Conductor	Jack Wire Color	Designation
White/Blue	Green	Telephone voice and data XT lead
Blue/White	Red	Telephone voice and data XR lead
White/Orange	Black	ADP Jack Tip lead
Orange/White	Yellow	ADP Jack Ring lead

Do not mount the modular jack assemblies on the wall at this time. They will be wall mounted later when the station instruments are installed.

Since the digital station equipment is not polarity sensitive, reversing the digital telephone pair has no affect on operation. The Station Interface circuits are current-limited and are not fused.

Key Telephones Installation

Key telephones may be mounted with three different orientations: Low Profile Desk Mount, High Profile Desk Mount or Wall Mounted. Packaged inside each key telephone carton are the following components:

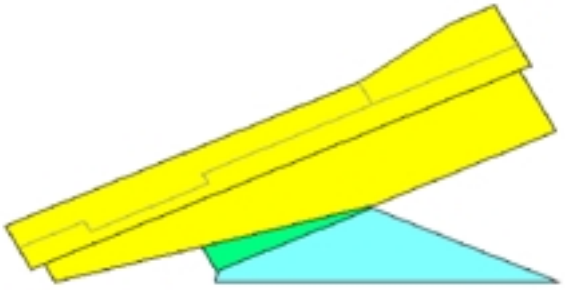
- Key telephone
- Key telephone handset
- 7-ft. line cord
- 4-in. line cord (for wall mounting)
- 12-ft. handset cord
- Small base-wedge mount assembly
- Large base-wedge mount assembly

The two wedge mount assemblies (large and small) are affixed at the factory. This configuration is used for High Profile Desk Mounting.

Remove the components from the carton and determine which mounting components are required. Most telephones are installed with both mounting wedges.

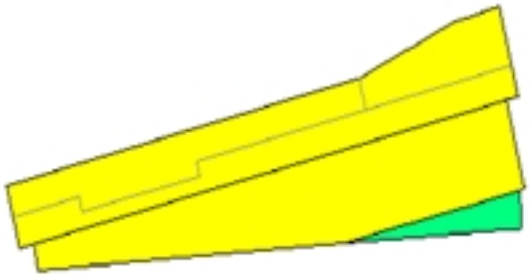
.**High Profile Mount** -- For the High Profile Mounted position, refer to the illustration and attach the Base Mount wedges.

1. The small wedge is always used for the various telephone mounting positions.
2. The small wedge has locking tabs at one end and hooks at the other end used in a hinging fashion.



Low Profile Mount -- When the key telephone is to be desk mounted in the Low Profile position:

1. Remove the two small screws that secure the small and large wedges together.
2. Store the larger wedge for possible use later (the large wedge is not used when mounting the key telephone in the Low Profile position).



3. Position the smaller wedge as illustrated.

   When using the Low Profile mounting position, it is important that the line cord be channeled through the slots in the telephone bottom housing, such that the smaller wedge locks them in place when in position.

Wall Mount -- When the telephone is to be Wall Mounted:

1. Remove the two small screws that secure the small and large wedges together.
2. Store the larger wedge for possible use later (the large wedge is not used when wall mounting the key telephone).
3. Position the smaller wedge as in the illustration at the right for wall mounting. Once in position, the smaller wedge and key telephone bottom housing provide for standard 630-type wall mount wall jacks.

Key Telephone Modular Jacks

Each key telephone has two modular jack connectors on the underside of the instrument. Both are located in a recessed connector cavity. When the telephone is held so that the rubber anti-skid feet are downward (no mounting wedge installed), the modular jacks face one another in the cavity. The modular jack at the right side of the cavity is the ADP connector and may be connected to an analog device at the desktop. *The ADP jack is only active when connected for operation at the MDF.* The modular jack at the left side of the cavity is the KSU jack and should be connected to the wall jack and station cabling for connection to the system KSU (refer to *Figure 2-25: Key Telephone Modular Jack Locations*).

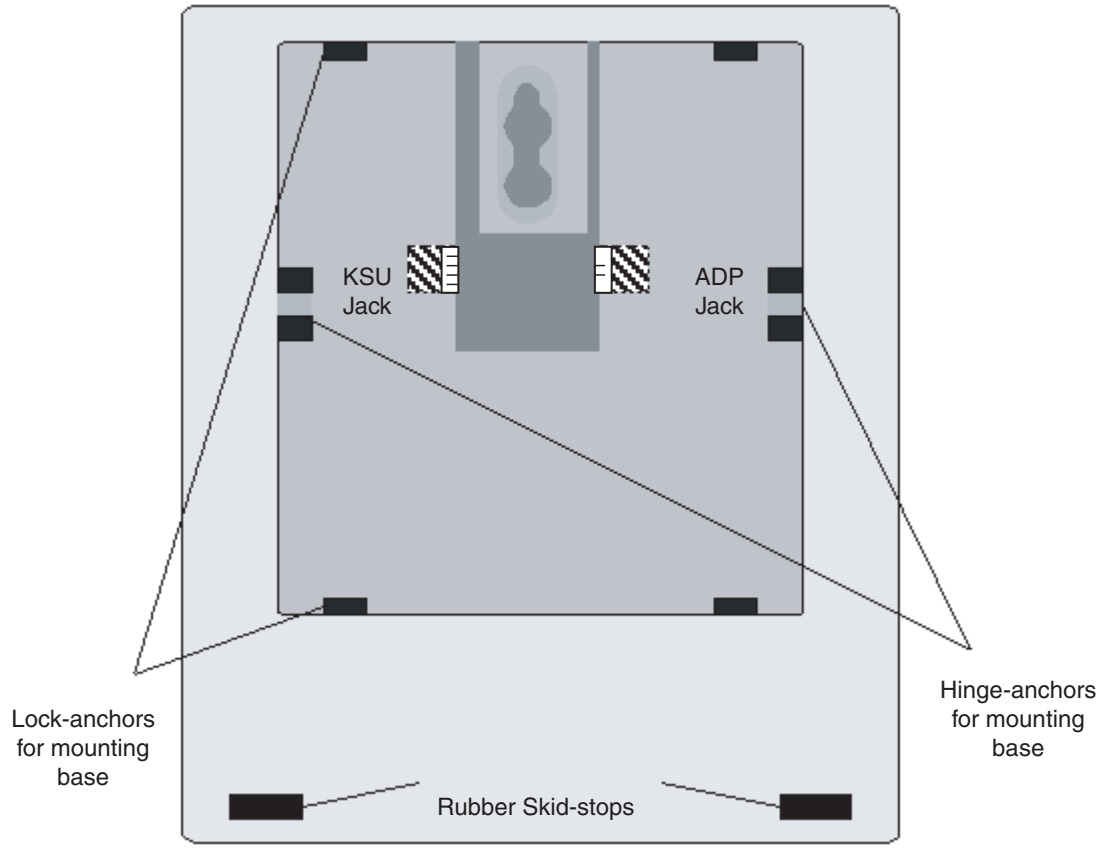


Figure 2-25: Key Telephone Modular Jack Locations

- ADP Jack - When wired at the MDF, the second pair of the telephone line cord/cable will activate this jack for any analog device function. This jack and wiring are completely independent of the key telephone operation and may be used for system resources. This is not FCC listed.
- KSU Jack - Connect the station cable line cord here. Two pair are provided. The first pair is all that is required for telephone voice and data. The second pair is looped to the ADP jack for use of analog devices at the desktop.

SMDR/SMDA Output Device

The output device or the Station Message Detail Recording (SMDR) must meet the requirements and match the RS232C pin-out described below.

- The SMDR port baud rate is programmable from 110 to 19,200 BPS.
- The Data Format is: 8 data bits, 1 stop bit, No parity bit.
- Connection of the SMDR serial port to a computer for call accounting is often relatively simple, since a straight-through cable will typically mate the devices.
- The SMDR serial port output is one way to the printer or other call accounting device.

The KSU end is considered DCE and printer or call accounting device is DTE.

KSU Connection

To connect an output device to the KSU:

1. Match the baud rates on the output device and the system.
2. Turn ON the AC power to both the device and the system before connecting the RS232C cable to Port-2 on the KSU. This prevents any electrical surges from being transmitted by the interface.

The RS232C cable connecting the SMDR device to the KSU must not exceed 50 ft. in length.

3. Carefully connect the RS232C DB-9 male end of the interface cable from the device to the SMDR RS232C DB-9 female connector located at the bottom edge of the MPB.

DCE	Male DB-9	Designation
K S U	1	DCD
	2	RX
	3	TX
	4	DTR
	5	GND
	6	DSR
	7	RTS
	8	CTS
	9	RI

Figure 2-26: RS-232C DB-9 Connector

Consult your peripheral device documentation for additional information.

Caller ID Connection

The purpose of this service is to provide calling party identification to the dialed party. This information can be the calling party's phone number, name, or a combination of this information. The information is delivered in between the first and second ring. The system can use this information to provide LCD information to stations receiving calls, and maintain a list of unanswered calls for call back via the Caller ID information.

Caller ID Box -- When Incoming Caller ID is to be used with the *DHS-L* system it is necessary to use the Caller ID Box. The Caller ID Box must be connected to the *DHS-L* system ICLID/PC Programming port using the Caller ID Cable. The Caller ID Box collects data at each CO line to be used for Incoming Caller ID and passes the data to the *DHS-L* system for processing. Each *DHS-L* CO line port must be programmed for the associated Caller ID Box port in *Customer Database Programming*.

ICLID/PC Port -- The Caller ID Box module is connected to the *DHS-L* system via the ICLID/PC programming port on the MPB. Consequently, the PC programming port cannot then be used for PC-based programming and Incoming Caller ID data collection simultaneously.

When all hardware connections are complete:

1. Adjust the Caller ID Box option switches for 1200 BPS operation.
2. Then program the *DHS-L* system PC Programming port for 1200 BPS operation. (A proprietary cable can be ordered, or you can use a standard null modem.)

External Paging Equipment (Optional)

The system provides a one way paging output at the KSU from the MISB which connects to two external paging ports. The input specifications for the external paging equipment should accept a 600 ohm and 0 dBm interface.

Install the external paging equipment as follows:

1. Punch down to a 50-pair block.
2. Connect the other end of the cable to the high impedance input according to the manufacturer's instructions.
3. Connect the paging speaker(s) to the amplifier using speaker cable.
4. Plug in the amplifier's AC power cord. (*DO NOT use the same AC outlet being used for the KSU).*
5. Set the paging amplifier's volume control to the lowest setting and turn ON the external amplifier.
6. From a station location, make a page by lifting the handset, and dialing 820 or 821, the External Page feature code.
7. Adjust the amplifier to the desired level while announcing the page.
8. PAGE VOL may be adjusted to lower the output signal in the event it is to strong for the connected amplifier input (over-driving input).

External Music Source

The system provides two external music inputs for connecting. The same music source may be used for both inputs.

The music source may be any device which provides a line output, including tape players, radios, or CD players. If using a radio, use only the headphone jack if no line output connection is available.

Do not use the speaker outputs of any music source.

To install an external music source:

Connect the line output leads of the music source to the wire1(+) and wire2(-) connections on the MISB connector.

Music Level Adjustment

1. Access an idle CO line, and dial into the system on another CO line.
2. When the system begins to ring, press [HOLD] to place the first call on hold.
3. Answer the ringing CO line. You should hear the MOH from the previous (now holding) CO line.
4. Adjust the music level at the source. That is, use the volume control of the radio (or other music source) to adjust the MOH level to a desirable level.

   If a comfortable desired music level cannot be obtained using these techniques, it is likely that the music source is not properly matched to the MOH input circuitry.

In some circumstances, there may be broadcast restrictions associated with music. Check with the original distributor and/or the radio station for copyright and broadcast restrictions concerning Background Music and Music-on-Hold.

How to Disconnect Background Music

To prevent Music-on-Hold from playing in the background:

Move Jumper (J2) to pins 1 and 2.

- MOH1 to BL/W
- MOH2 to OR/W

Loud Bell Control (LBC)

When the MISB is installed, the system provides two dry contact closures to signal externally powered alerting devices for any incoming CO Line call. Transferred CO Lines that recall system wide will also activate the LBC, in the same cadence as for an incoming CO Line ring.

1. Determine which CO lines should operate the Loud Bell Control (LBC) relay. Program each of these lines separately for LOUD BELL = Y.
2. Terminate the other end of the cable on an industry standard 66M1-50 block for interconnection to the loud bell and power source.

3. Terminate the Loud Bell and power supply leads on an industry standard 66M1-50 block.
4. Using cross-connect (jumper) wire, connect each of the three LBC components (contact, bell and power source) in series fashion.

The LBC output on the KSU provides only interrupted dry contact closure during the ringing period of incoming CO Lines.

Relay contacts on the DHS-L are rated at 50V DC 1.0 amp. Do not apply AC voltage to these contacts.

2-Port Analog Adapter

The 2-Port Analog Adapter is used to connect analog SLTs and other analog devices to the system. The analog device must provide DTMF (touch tone) signals in order to make intercom calls, access outside lines and to activate system features. Some examples of analog devices are: telephone answering device (TAD), facsimile machine (FAX) or modem.

The 2-Port Analog Adapter is not an OPX device as determined by FCC Rules. Additional equipment is required to support OPX lines. The Analog Adapter will not support Message Waiting Indication for SLT devices. The Analog Adapter will supply Stutter Dial Tone to the user.

The 2-Port Analog Adapter only works with the DTIB-8.

The 2-Port Analog Adapter is designed for installation at the MDF but may be positioned anywhere along the cable path between the KSU and the SLT (or other analog device).

Do not exceed the maximum cable length from KSU to SLT regardless of where the 2-Port CO Module is installed.

1. The 2-Port Analog Adapter is contained in a wall mount enclosure with pre-drilled flanges for simple mounting. Properly mounted, the hinged cover will open upward and lock into position for servicing.
2. Inside the enclosure, the 2-Port Analog Adapter Printed Circuit Board (PCB) is seen with three RJ-11 modular jacks along the bottom edge of the PCB. One oriented toward the right side of the 2-Port Analog Adapter PCB is labeled IN. The other two jacks are labeled OUT1 and OUT2.
3. Extend each of these jacks to the MDF using modular cords and terminal blocks.
4. Once on the MDF, connect the IN jack to the desired digital station port to be used for analog device interface. This connection requires that the green and red wires (White/Blue pair) be used.
5. The modular jack OUT1 is now operational as an analog device port with the same station number that would have been used by a digital key telephone connected to this port. (The OUT2 is the same extension as if a DTIB-16 card was installed in the slot or the B2 channel for that slot.)

6. Refer to the Station Numbering Plan listed in *Table 2-12*.

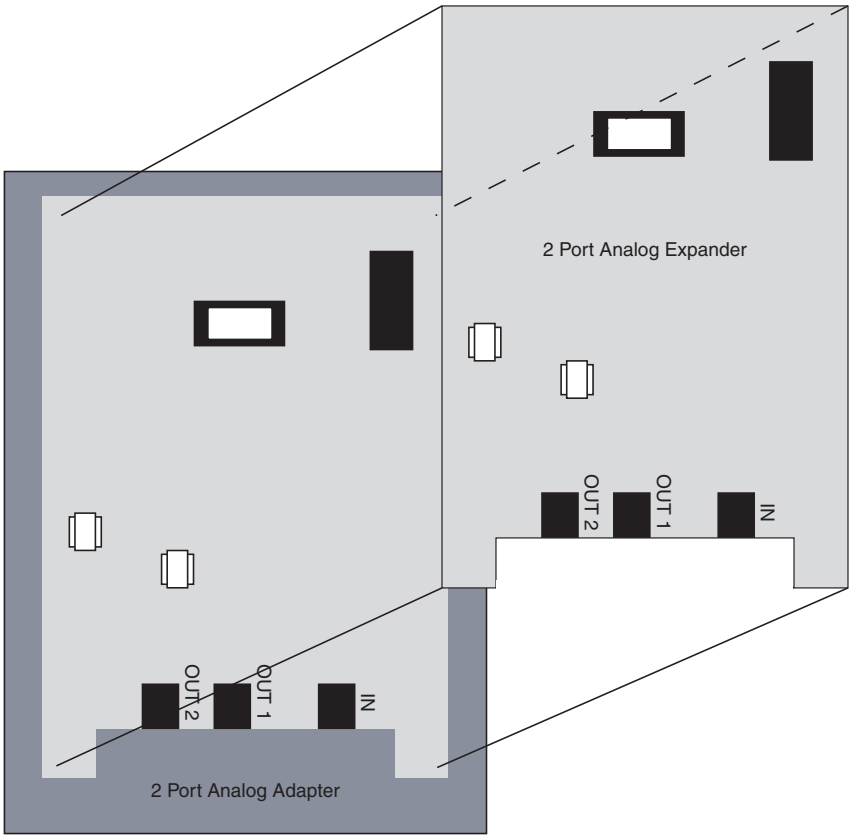


Figure 2-27: 2-Port Analog Adapter

2-Port Analog Expander

The 2-Port Analog Expander is a single PCB identical to the PCB of the 2-Port Analog Adapter. One 2-Port Analog Expansion may be housed in the 2-Port Analog Adapter enclosure. The expansion is shipped with screws used to secure it to the existing 2-Port Analog Adapter PCB stand-offs. Since the PCB and circuit function are identical to the 2-Port Analog Adapter, follow the installation wiring instructions provided for the 2-Port Analog Adapter (Refer to *2-Port Analog Adapter*).

1. Position the 2-Port Analog Expander over the stand-off posts that are factory installed on the 2-Port Analog Adapter PCB.
2. Using the screws supplied with the 2-Port Analog Expander, secure the 2-Port Analog Expander PCB to the stand-off posts (refer to *Figure 2-27*).

Only one 2-Port Analog Expander can be installed in a 2-Port Analog Adapter housing.

System Check-Out

After completing installation on the *DHS-L* system, it must be initialized so that default data can be loaded. Prior to actual power up and initialization, the *DHS-L* should be checked-over to avoid startup delays or improper loading:

1. Make sure that the KSU is properly grounded.
2. Verify that all PCBs are firmly seated onto their connectors.
3. Inspect the MDF for shorted wiring and improper polarity that would affect the Digital Key Terminals or DSS consoles.
4. Make sure that the plug-ended MDF cables connected to the KSU are secure and are plugged into the correct position.

Power Up Sequence

The power up sequence involves the proper application of AC power to the system. A successful power up is assured if the installation procedure has been followed:

1. Plug the AC power cord of the KSU into the dedicated 117V AC outlet.
2. Locate the database INITIALIZATION jumper JP3 on the MPB (refer to *Figure 2-28*). It is located at the front edge of the MPB (in the center). It is also labeled ON and OFF.

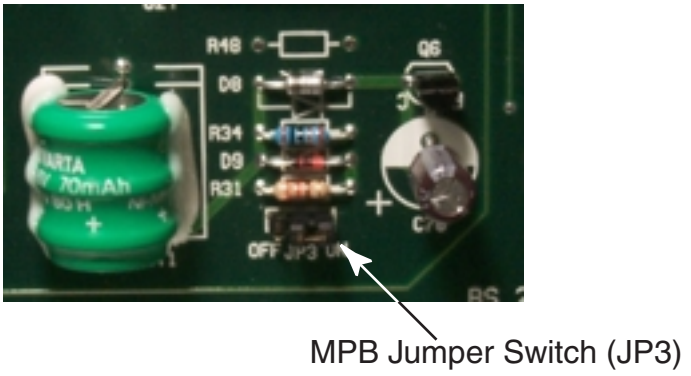


Figure 2-28: Jumper Switch

3. This jumper controls the connection to the dynamic RAM battery circuit. When jumper is OFF, customer database programming is not protected by the memory battery in the event power is lost. In normal operation this jumper should be ON at all times.
4. To load default at this time, turn KSU power OFF.
5. Operate the INITIALIZATION jumper to the OFF (left) position.
6. Allow the system and jumper to remain in this state for approximately 2 minutes.
7. Operate the INITIALIZATION jumper to the ON (right) position.
8. Restore system power.

9. Observe the MPB/Power LED. After approximately 4-6 sec., the LED should begin to flash.
10. If the LED remains unlit or lit without flashing, repeat the above steps from Step 3.

    Once the power up sequence is complete, DEFAULT DATA is loaded and the system should be fully operational.

Refer to Chapter 6, "Maintenance/Troubleshooting," for further assistance if power up cannot be activated.

Feature Upgrade Procedure

Use the following procedure to upgrade the *DHS-L* system Feature Package software. Once the upgrade is complete, the system must be initialized to assure proper operation.

Any handling of system integrated circuits must be done in a static controlled environment. Please use satisfactory static preventive practices while handling system components and while working on the system KSU with cover removed. (USE A STATIC WRIST STRAP!)

1. Disconnect system power and remove the KSU cover.
2. Remove the MPB Card.
3. Using an IC extractor tool, remove the *DHS-L* software EPROM.
4. Carefully remove the new software EPROM from its packing material and inspect for damage (if any damage is noticeable please contact Vodavi Customer Service).
5. Install the new EPROM into the socket with extreme care so that no EPROM pins are bent when inserted. The EPROM must be inserted such that the notch is oriented at the top of the chip when in place (same orientation as the previously removed chip).
6. Reinstall the MPB removed in Step 2.
7. Following proper power up and initialization, the system should function properly with the new Feature Package software features operational. All specific customer database data must be re-entered to customize system operation for use.

The RAM battery requires 14 hr normal (powered) system operation for adequate charging.

3 Key Station Features, Operation, and Programming

The System and Key Station features and programming of the *STARPLUS® DHS-L™* Systems are listed and described in this chapter. An abbreviated feature index is provided in *Table 3-11: Feature Access Codes*, full-feature descriptions are provided alphabetically following *Table 3-12: System Numbering Plan*.

General Conventions

DHS-L Features

System Access -- System resources are accessed using directory numbers to dial access the resource (station numbering, Hunt Group numbering, etc.).

- The [FEAT] button joined with dial key codes will appear throughout the text. This button is used to access most system features.
- Press the [CLEAR] button to cancel the current operation.

Programming Mode -- System programming can be executed at any idle Executive Key Telephone. Only one station may enter the system programming mode at any time.

- Valid programming is confirmed with a single beep tone from the speaker.
- Invalid programming is alerted with a double beep tone.

One-Button Access -- Any feature or resource code may be stored for one-button access under an available Programmable Feature Button.

LCD Prompts -- Operation steps are oriented for the Executive Key Telephone since the interactive LCD prompts encompass all Executive Key Telephone functions.

Soft Button / Display -- Three LCD interactive Soft Buttons are positioned beneath the display on the Executive Key Telephone. These buttons are used during feature operation for interactive display prompt menus. For orientation purposes, the Soft Buttons may be referred to as the left, center and right Soft Buttons.

The following is an example of the LCD display at an idle Executive Key Telephone. The Soft Buttons are immediately below the bottom line of the display oriented at left, center and right positions.

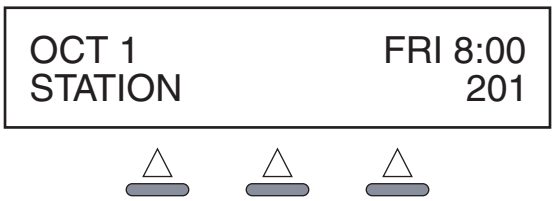


Figure 3-1: Soft Buttons

Soft Button Prompts

bksp: When the new programming data entry is not desired, the station user may press the backspace [bksp] button to erase the last data entered and return to the immediately preceding prompt.

save: When the new data is entered, the system will check the entered data automatically. If the entry is invalid, the prompt will be refreshed. The station user must press the store [save] button to confirm entry and continue with the next prompt item.

chg: Press the change [chg] button to modify the current prompted item. If the data/message to be changed is generated by the system itself, the current programming item will be replaced by new data (toggled between YES and NO, or cycled through several data/messages) when the user presses the [chg] button.

next: Repeated depressions of the [next] button will present the next selection or the next programmable item within the current category.

back: Repeated depressions of the [back] button operate similarly to the [next] button where the previous programming category is selected, or the previous programming item within the current category is selected.

show: Press the display [show] button to enter into detailed item feature programming of a specific category, or to display current programmed content of the feature.

clear: The [clear] button can be used at anytime in system programming. Depressing this button aborts any programming in progress and returns the Executive Key Telephone to an idle state.

Programming

Programming Tip

The moment the [chg] button is pressed and the value displayed, that operation becomes functional (this is true for any database field where the [chg] button selects from the available data field values).

In other areas of programming where data is entered from the dial pad, the [save] Soft Button must be pressed to save that entered data.

Using a PC

The *DHS-L* software allows the service technician to program the *DHS-L* system using an external, PC-based, DOS software programming tool. The DOS software tool streamlines programming and allows for database printout and reserve storage. Operation of the PC Programming software is not covered in this text. Those unfamiliar with PC operation and the DOS environment should rely on the following (all encompassing) built-in Database Administration facility.

Using a Keyset

Three LCD interactive soft buttons are instrumental in the database programming process. Programming must be performed at an Executive model key telephone.

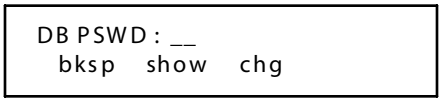
Operation

To make changes in the customer database, you must enter Database Programming from an idle Executive (display model) Key Telephone. (Any Executive Key Telephone connected to any station port will serve as the programming entry terminal).

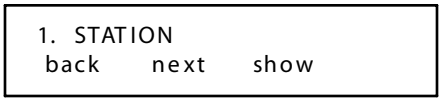
To enter the programming mode:

1. From an idle station, press the [FEAT] button. The display changes as seen below:

2. Dial [#] + [✳] on the keypad. The display prompts for the database password. The default password is ######## (8 #s).

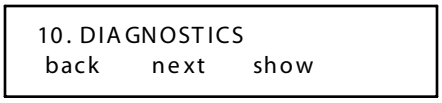


3. When the center Soft Button [next] is pressed, the next sequential programming category is displayed.

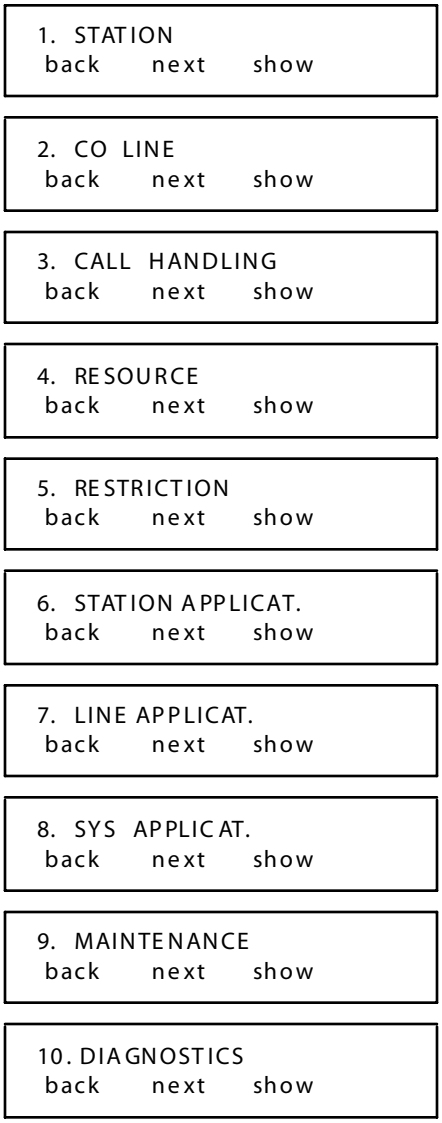


-or-

If the left Soft Button [back] is pressed, the last programming category is displayed.



The two Soft Buttons (left and center) [back] and [next] can be pressed repeatedly to move through the programming categories in a menu fashion. The programming categories and associated displays are as follows:



Programming

Database Password

The default Database Programming Password may be changed from ####### to any other 8-digit numerical sequence.

Default

The *DHS-L* User Password is 0000, and has a programmable range from 0000-9999.

System Programming Tables

The following tables briefly describe the *DHS-L* system functions and their programming default values.

Table 3-1: Station Programming Table

STATION		Range	Default	Description
1.	POSITION	Non-Programmable	None	Represents the system position for that station number (1-XX-YY): ☐ 1 = module (1 only) ☐ XX = card slot 4-12 ☐ YY= port on card 01-08, 01-16.
2.	TENANT GROUP	1-6	1	There are 6 tenant groups in the system. Each station may be assigned to one tenant group.
3.	PICKUP GROUP	1-24	1	Stations can only be assigned to one group. Stations within a group may answer calls from another station by dialing the pickup code.
4.	PAGING GROUP	1-24	1	Stations may be in only one page group and will receive internal pages for only that group.
5.	STA TYPE	Staff/Guest	Staff	Staff is used for normal office operation; Guest for Hotel/Motel.
6.	DAY COS	0-7	0	Determines the station dialing privileges in the day mode of operation (no restrictions).
7.	NIGHT COS	0-7	0	Determines the station dialing privileges in the night mode of operation (no restrictions).
8.	WARNING TONE	Y/N	N	The Drop Time-out Warning Tone is used to alert a station user that a CO call is about to be dropped. Other programming determines when a call is dropped.
9.	DROP TIME OUT	Y/N	N	Drop time-out automatically terminates CO calls after a programmed time. The time is programmed in Call Handling if warning tone is enabled it will be heard before the call is dropped.
10.	INTRUS. ACTIVE	Y/N	N	Allows a station to monitor another station.
11.	INTRUS. ACCEPT	Y/N	Y	Allows the station to be monitored.
12.	INTRUS. TONE	Y/N	Y	Determines if a station being monitored will hear a tone when being monitored.
13.	NO FUNC. KEY	Y/N	Y	Allows a function key on the phone.
14.	FORCED LCR	Y/N	N	Forces all calls through the Least Cost Routing feature.
15.	DATA AUTO ANS	Y/N	Y	This feature is currently not used.

Table 3-1: Station Programming Table

STATION		Range	Default	Description
16.	ECF OPERATION	Y/N	N	Allows station to set External Call Forward.
17.	SMDR OUTPUT	Y/N	Y	Allows the station to generate a call record for each call.
18.	PORT TYPE	STA/VM/VA	STA	Port type can be either an extension voice mail or voice announce.
19.	DIR. NO. SWAPPING	--	--	Each station port has an assigned extension. The extension number may be exchanged (swapped) with any other station port.
	Swap With			Enter number station is to be changed to.
20.	LINE ASSIGNMENT	Each station can have access to specific line/s on the system or all lines for outgoing calls.		
	Show Module	1	1	Always 1
	Show Slot	3-12	--	Enter the slot the desired CO card is in.
	Port 1 - Port 8	TNT1-TNT6 Y/N	TNT1 Y	Port indicates access for port of line card. TNT indicates tenant group that CO line is assigned to.
21.	RECEIVE ASSIGNMENT	Each station can be set to receive incoming call indications for every line on the system or a specific line(s).		
	Show Module	1	1	Always 1
	Show Slot	3-12	-	Enter the slot the desired CO card is in.
	Port 1 - Port 8	TNT1-TNT6 Y/N	TNT1 Y	Port indicates access for port of line card. TNT indicates tenant group that CO line is assigned to.
22.	DSS UNIT 1	Any valid sta	Null	Up to 4 DSS units may be assigned to a specific station.
23.	DSS UNIT 2	Any valid sta	Null	Up to 4 DSS units may be assigned to a specific station.
24.	DSS UNIT 3	Any valid sta	Null	Up to 4 DSS units may be assigned to a specific station.
25.	DSS UNIT 4	Any valid sta	Null	Up to 4 DSS units may be assigned to a specific station.

Table 3-2: CO Lines Programming Table

COLINE		Range	Default	Description
1.	POSITION	Non-Programmable	None	Represents the system position for that station number (1-XX-YY): ☐ 1 = module (1 only) ☐ XX = card slot 4-12 ☐ YY= port on card 01-08, 1-24 (T1).
2.	TENANT GROUP	1-6	1	There are 6 tenant groups in the system. Each station may be assigned to one tenant group.
3.	ROUTE	1-24	1	Used to group trunks together. Each trunk may be assigned to one trunk group.
4.	DAY COS	0-7	0	Determines the line dialing privileges in the day mode of operation.
5.	NIGHT COS	0-7	0	Determines the line dialing privileges in the night mode of operation.
6.	DIALING	Tone/Pulse	Tone	Determines which line will use DTMF or Dial Pulsing when dialing out.
7.	LINE TYPE	CO/PBX/Page/ Empty	CO	To program what type of trunk is connected to that circuit.
8.	CALL ABANDON	Y/N	N	To program the trunk to drop the call after a loss in loop current.
9.	PRIVATE TO	Any valid station	Null	Specifies a station that a specific trunk will be private to.
10.	VM DIGITS	Any valid mailbox	Null	
11.	ANSWER POSITION	Station 201 is the only ringing station by default. 6 positions may be programmed for each ringing option, and 1 position for Night mode.		
	Day 1 (Member 1-6)	Any valid station or hunt group	201	Six members are available for ringing assignment.
	Day 2 (Member 1-6)	Any valid station or hunt group	201	Six members are available for ringing assignment.
	Day 3 (Member 1-6)	Any valid station or hunt group	201	Six members are available for ringing assignment.
	Night	Any valid station or hunt group	201	Only one member is available for ringing assignment.
12.	CO Pre Dest	Any valid station or hunt group	Null	

Table 3-3: Call Handling Programming Table

CALL HANDLING		Range	Default	Description
1.	LINES CONFERENCED	Y/N	N	Determines if line is allowed to be included in a conference call.
2.	CO FLASH	0.1-1.5	1.0	Sets the flash time on CO type trunks.
3.	PBX FLASH	0.1-1.5	0.2	Sets the flash time on PBX type trunks.
4.	PAUSE TIME	1-8	2	Sets the pause time used for speed dialing, and VM prefixes.
5.	DIALING RATIO			
	Break Time	60/67	67	Timer is used for pulse dialing.
	Inter_dgt	400-800	800	Timer is used for both pulse and DTMF dialing This is in milliseconds.
	Tone Time	90/120/150	90	Sets the length of the DTMF tone in milliseconds.
6.	PR TIME	20/40….300	100	The Polarity Reversal timer can be programmed in 20 second increments, and controls the Call Abandon in CO programming.
7.	RING ABANDON	1-10	6	Must be set 1 second longer than the longest silent period of the incoming ring cycle.
8.	HOLD REMINDER	0/10/30/60/90	60	Timer is used for the system hold reminder.
9.	EX_HOLD TIME	0-8	0	Exclusive Hold Timer is set in 1 minute increments.
10.	WARNING TIME	01-30	5	Used for the drop time in station settings and is programmable in minutes.
11.	XFR_I RECALL	16/30/60/90/120	30	The NO ANSWER recall timer is used for CO transfer recall.
12.	XFR_B RECALL	16/30/60/90/120	60	The BUSY recall timer is used for CO transfer recall.
13.	SLT RECALL	30/60/90	30	This timer is used only for SLT phones.
14.	SLT HOOK_FLASH			
	Start	60/100-1400	200	Timer must be set 100 ms less than the SLT flash time.
	End	100-1500	800	Timer must be set 100 ms more than the SLT flash time.
15.	PBX AUTO PAUSE	0-9	1	Timer is used only for lines that are programmed as PBX.
16.	D_TONE DETECT	Y/N	N	This is used for detecting dial tone on a CO line before dialing.

Table 3-3: Call Handling Programming Table

CALLHANDLING		Range	Default	Description
17.	D_TONE TIME	200-800	200	This timer is used if the Dial Tone Detect option is set to YES.
18.	DIAL WAIT TIME	0-8	0	This timer is used when the Dial Tone Detect is set for NO.
19.	B_TONE TIME	100-800	500	The Busy Tone Interval is used to match the expected busy tone from the CO/PBX. This option is used with the AUTO BUSY REDIAL feature.
20.	DIAL DELAY	100/500....2000	500	When making an outgoing CO call this is the time of delay the transmission path must be delayed before a connection. This is used with the toll restriction feature and must match the time the CO requires before providing dial tone. This is set in milliseconds.
21.	CO PRECFW TME	10-60	30	This timer controls when a CO line will be preset forwarded when programmed under CO Parameters: Answer Position: CO Preset Forward.
22.	CAMP ON TIME	0-60	20	This sets the interval between camp on tones.
23.	ALARM PLAY	10/30/60-600	30	This option sets the reminder beep when the extension reminder is reached.
24.	HOTEL ENABLE	Y/N	N	This feature is used to set Hotel/Motel features on system.
25.	SYS ABBR CHECK	Y/N	N	When set to Yes the stations COS determines what speed dial locations may be dialed.
26.	TSI CONNECT	Y/N	N	This option enables/disables the outgoing CO call transmission path before toll restriction is satisfied.
27.	CONF TONE	Y/N	N	This enables/disables conference tone.
28.	CALL DURATION	1-60	10	This option is used for outgoing call to simulate answer supervision for SMDR.
29.	VM MON TIME	10-60	10	This timer controls the maximum interval allowed for a station user to activate the Answering Machine Emulation feature.
30.	METER SYSTEM	Y/N	N	This is not applicable to the *DHS-L*.
31.	ICLID NAME	Y/N	Y	Determines if the calling name will be displayed (if provided) on display phones and ICLID ID enabled.
32.	TENANT CALLING	Y/N	Y	Determines which tenant groups can call each other.

Table 3-3: Call Handling Programming Table

	CALLHANDLING	Range	Default	Description
33.	SMDR CALL OUTPUT			
	Outgoing Call	Y/N	Y	Determines if Outgoing CO calls will be outputted to SMDR.
	Incoming Call	Y/N	N	Determines if Incoming CO calls will be outputted to SMDR.
	Account Code	Y/N	Y	Determines if Account codes will be outputted to SMDR.
	Output Form	80	80	Up to 80 characters per line can be set for SMDR output.
34.	AUTO BUSY REDIAL			
	ABR Attempts	0-99	8	This feature detects a busy call attempt and will make the number of attempts set.
	ABR Interval	30/60/90/120	60	This is the time it will wait to redial. This feature will only operate properly if the Busy Tone is programmed to match the CO/PBX.
35.	EXTERNAL FWD			
	Service	Never/Day/ Night/Always	Always	Stations that have the necessary programming are allowed to call forward their calls to external locations.
	Talk Time	1-5/10/15	5	Timer controls how long a ECF call may talk.
36.	AUTO ATTENDANT			This feature is not available for *DHS-L*, nor is it applicable to the *DHS-L* system.
	Ring_T To Ans	1-20	3	
	Ring No Ans	10-90	10	
	Show Line	700-795	None	
	Auto_A Line	Y/N	N	
	Service	Never/Day/Night/ Always	Never	

Table 3-3: Call Handling Programming Table

CALLHANDLING		Range	Default	Description
37.	DISA			
	Ring_T To Ans	0-99	0	Sets the time to answer for DISA.
	Allowed Sta COS	0-7	0=Y 1-7=N	Allows DISA access on a per COS.
	Sta COS (0-7)		Y	
	Show Line		700-795	Allows DISA access on a per CO.
	DISA Line	Y/N	N	Enables/disables per CO line.
	DISA Day COS		0	Sets the day COS for each CO line.
	DISA Night COS	0-7	0	Sets the night COS for each CO.
	Service	Never/Day/ Always/Night	Always	Sets the time of day answer.
	Talk Time	1-5/10/15	5	Sets the talk time of the line.

Table 3-4: Resource Programming Table

	RESOURCE	Range	Default	Description
1.	DB PASSWORD	00000000/ #######	#######	The System Database Programming password
2.	ATTENDANT			
	Show Tenant	1-6	1	Each tenant group can have a primary and alternate attendant with 4 DSS/BLF units assigned to each (DSS/BLF units are programmed later).
	Attendant	Any valid station	201	Any station can be an Attendant.
	Att. DSS	1-4	Null	These are a non programmable item.
	Alternate	Any valid station	Null	Any station can be an Alternate Attendant.
	Alt. DSS	1-4		An Alternate DSS is non programmable.
3.	SYSTEM REMINDER			
	Show Tenant	1-6		Each tenant group can have 8 system reminders programmed (alarms).
	Play Time	1-10	1	The play timer is programmed for each group in 1-10 increments.
	Reminder	1-8	Null	Enter a time 24 hour format that the reminder tone should go off.
4.	USER PASSWORD	0000-9999	0000	Each station has a password that is used for many system and user options.
	Length	4-8	4	Password length is programmable.
	Show Sta			Enter number of station.
	PSWD	0000-9999	0000	
5.	USER NAMES	Any valid station	Null	Each station user can have a name associated with it up to 7 characters long.
	Show Sta	-	-	Enter number of station.
	(Enter alpha characters)		Null	Enter alpha characters, then press 1 for Q, * for lower case, 0 for other options.
6.	LINE NAMES	Any valid line #	Null	Each line can have a name associated with it up to 7 characters long.
	Show Line	-	-	Enter line DIR number.
	(Enter alpha characters)		Null	Enter alpha characters, then press 1 for Q, * for lower case, 0 for other options.

Table 3-4: Resource Programming Table

	RESOURCE	Range	Default	Description
7.	PREPROG. MESSAGE			
	Outgoing Message	1-6		There are 6 preprogrammed messages. The default Outgoing messages are: ☐ Have a good day ☐ Call Operator ☐ Call Home ☐ Call Back ☐ Friend Visiting ☐ Urgent
	Premises Message	1-6		There are 6 preprogrammed messages. The default Premise messages are: ☐ Out for lunch ☐ Be back soon ☐ Left for the day ☐ In a Meeting ☐ Out of office ☐ On vacation
8.	SYSTEM ABBR. NO.			ABBR refers to Speed Dialing.
	Show Tenant	1-6		There are 100 allocated speed dial numbers to tenant group 1. The other tenant groups do not have speed numbers assigned.
	Abbrev. No.	600-699		Each speed dial location has a number assigned to it. By default they are 600 -699 and can have a maximum of 20 digits.
9.	MUSIC SOURCE			
	Source ID	1-2		The 2 music source inputs can be programmed separately.
	Application	Both/BGM/MOH	Both	This is the setting for each source.
	Tenant Group 1-6	All Groups=Y		Each tenant group can have access to either of the music sources.
10.	EXTERNAL PAGER			
	Pager ID	1-2		There are 2 Paging ports.
	Tenant Group	1-6		There is a setting for each tenant.
	Paging Gp.	1-24 1=Y 2-24=N		There are 24 paging groups in the system. The external paging ports may be included in that paging group so that when the internal group is accessed, the page will also broadcast over the external page.

Table 3-4: Resource Programming Table

	RESOURCE	Range	Default	Description
11.	LOUD BELL			
	Loudbell ID	1-2		There are 2 loudbell interface ports.
	Trunk Route	Y/N	N	Any or all of the CO line groups can be programmed to ring either of the loudbell ports.
12.	DSS ALLOCATION			
	DSS Unit # 1-12			Up to 12 DSS units can be installed.
	DSS Owner	Any valid station	Null	The owner must be connected to the system and can not be an existing DSS directory number.
	DSS Number	Any valid station	Null	The DSS must be connected to the system and cannot be the same directory number as an existing station or DSS.
13.	RMT X_RATE	110-19200	9600	The RMT rate is used in setting the baud rate for the RMP programming or the ICLID.
14.	CIL X_RATE	110-19200	9600	The CIL rate is used for the SMDR port.

Table 3-5: Restriction Programming Table

	RESTRICTION	Range	Default	Description
1.	CALL DISCRIMINATION			
	Show Tenant	1-6		Each tenant group has 100 toll restriction tables 001-100.
	Dgt. Interval	001-100	From: 0 To: #001	This means that the system can dial any digit as the first digit.
	Station COS			
	Day Allowed	Class 0-7	0=Y	Each COS may be allowed or denied the ability to dial the digits in the Dgt. Interval.
	Night Allowed	Class 0-7	0=Y	Each COS may be allowed or denied the ability to dial the digits in the Dgt. Interval.
	Line COS			
	° Day Allowed	Class 0-7	0-7=Y	Each COS may be allowed or denied the ability to dial the digits in the Dgt. Interval.
	° Night Allowed	Class 0-7	0-7=Y	Each COS may be allowed or denied the ability to dial the digits in the Dgt. Interval.
2.	LEAST CALL ROUTING			
	Show Tenant	1-6		Each of the 6 tenants can have a unique LCR assignment.
	LCR Tab. Assign			There are 4 tables programmed in LCR. The tables are unique to the tenant group being programmed.
	° Digit Comp.Tab.	0-300	300	There are 300 digit comparison tables that can be shared by the tenant groups. (All 300 tables are assigned to tenant group 1).
	° Time of Day	0-60	60	There are 60 Time of day table that can be shared by the tenant groups (All 60 tables are assigned to tenant group 1).
	° Route Table	0-24	24	There are 24 Trunk Route tables that can be shared by the tenant groups (All 24 trunk routes are assigned to tenant group 1).
	° Digit Modi. Table	0-48	24	There are 48 digit modification tables that can be shared by the tenant groups A maximum of 24 tables can be assigned to 1 tenant group.

Table 3-5: Restriction Programming Table

	RESTRICTION	Range	Default	Description
2.	LCR Tab. Prog.			The content of the LCR tables are programmed in the following tables.
	° Digit Comp. Tab.			The digit comparison tables are programmed similar to the toll restriction tables. Enter a FROM: digit 0-9 X = wildcard to a TO: digit 0-9 X = wildcard Time of Week List= Sunday=1 Monday=1 – Saturday=1 The time of week list is used to assign LCR trunk route numbers to this interval for a particular day of the week.
	° List Number	001-300		The digit comparison tables are programmed similar to the toll restriction tables. Enter a FROM: digit 0-9 X = wildcard to a TO: digit 0-9 X = wildcard Time of Week List= Sunday=1 Monday=1 – Saturday=1 The time of week list is used to assign LCR trunk route numbers to this interval for a particular day of the week.
	Time of Day Tab.			Time of day tables define which LCR trunk routes will be used for a particular time of day. A different LCR trunk route may be assigned to a different time slot during the day.
	° List Number	01-60		Enter a time of day list number.
	° Time Assignment			The time assignments are established by entering a starting time in TIME 1 and an ending time in TIME 2. TIME 2 then becomes your starting time for the next time slot of the day. TIME 6 becomes the start time for the last slot of the day with TIME 1, time 1 being the ending time.
	° Route Assignment			Each time slot has an LCR route table assigned to it. Enter a route 1-24 for each time slot for the day.

Table 3-5: Restriction Programming Table

	RESTRICTION	Range	Default	Description
2.	Time of Day Tab.			Time of day tables define which LCR trunk routes will be used for a particular time of day. A different LCR trunk route may be assigned to a different time slot during the day.
	° List Number	01-60		Enter a time of day list number.
	° Time Assignment			The time assignments are established by entering a starting time in TIME 1 and an ending time in TIME 2. TIME 2 then becomes your starting time for the next time slot of the day. TIME 6 becomes the start time for the last slot of the day with TIME 1, time 1 being the ending time.
	° Route Assignment			Each time slot has an LCR route table assigned to it. Enter a route 1-24 for each time slot for the day.
	Route Tab.			There are 24 route tables. Each table has 4 digit modification tables – choice 1 is the primary; choice 2 is the secondary, etc.
	° List Number	1-24		Enter the list number.
	° Choice	1-4		Enter the choice.
	° Route	1-24		Enter the trunk route to use when this choice is implemented.
	Dgt Modi Tab.			There are 24 digit modification tables which are used in conjunction with the trunk routes to ensure that the proper dialing sequence is performed.
	° List Number	1-24		Enter the number of the digit modification table to be programmed.
	° Delete Digits	None, 1-16	0	Enter the location of the digit, if any to delete from the dialing string. The location can be from 0 (none) to 16.
	° Prefix Digits	0-9,*,#	Empty	Up to 14 digits can be programmed as prefix digits Prefix digits are dialed prior to the number and can be 0-9,*,# pause and wait for dial tone.
	° Insert Digits	0-9,*,#	Empty	Up to 16 digits may be inserted into the dialing string. The digits are inserted in the string at the insert location.
	° Insert Position	0-16	0	The inserted digits are inserted at the insert position. The insert position can be 0 (none) to 1-16.

Table 3-5: Restriction Programming Table

RESTRICTION		Range	Default	Description
3.	ACCOUNT CODES			The system allows 300 different account codes to be programmed. The account codes are used for SMDR and traveling COS.
	Length	2-8	3	The length of the account codes may be programmed from 2 to 8 digits All account codes follow this length.
	Password			Enter the desired password ID number you will be programming.
	ID Number		001-300	
	Pswd.		Null	Enter the desired account code that matches the length set above.
	COS	0-7	0	Enter the station COS to be used during dialing.

Table 3-6: Station Application Programming Table

	STATION APPLICATION	Range	Default	Description
1.	UCD PROGRAMMING			
	UCD Group	1-24		24 UCD groups are allowed in the system.
	Tenant	1-6	1	The tenant group to which the UCD group is assigned.
	UCD Attrib	UCD/VA	UCD	This defines the hunt group type.
2.	UCD GROUP MEMBER			
	Member	Any valid station number		Each UCD group may has 24 members in it.
	Hunt Method	Line/Dist/All	Line	There are 3 hunting methods allowed: Linear (LINE) Distributed DIST) All Ring (ALL).
	No Ans Time	5-60	10	This option defines the length of time a call will ring a member of the group before advancing to the next member.
	Over 1 Timer	0-255	0	This timer determines the length of time that a call will ring in the UCD group before being transferred to the overflow 1 destination If the timer is set to 0 then it will not overflow to the overflow 1 destination.
	Over 1 Dest		Null	This is the overflow 1 destination and can be any valid station number or another UCD group.
	Over 2 Timer	0-255	0	This is the same as the over 1 timer except it overflows to the over 2 destination.
	Over 2 Dest		Null	Same as over 1 destination.
	Over Counter	1-128	1	This option defines how many times a unanswered call cycles to the overflow 2 destination before going to the reroute destination.
	Reroute Dest		Null	This option defines the final destination for unanswered calls to a group. This option is used only when: ☐ No overflow 2 destination is defined and the call remained unanswered by destination 1. ☐ The call remained unanswered by the overflow 2 destination after the overflow count has expired. The reroute can be any extension or another UCD group.

Table 3-6: Station Application Programming Table

STATION APPLICATION		Range	Default	Description
3.	VOICE MAIL			
	VM Hunt Group	0/1-24	0	The voice mail ports must be programmed in a unique UCD group. The VM HUNT group and the UCD groups must be the same group (i.e: VM hunt group 1 = UCD group 1).
	Prefix Table			There are 10 prefix tables that can be sent to the VM in certain conditions. The prefix codes are up to 4 digits in length and can include 0-9,*, #, and Pause (P).
	ICM/VM		Null	This prefix is sent to the VM prior to the user's extension number when checking messages.
	Transfer		Null	This prefix is sent to the VM prior to the user's extension number when a call is transferred directly to the mailbox.
	Direct Fwd.		Null	
	Busy Fwd.		Null	This prefix is sent to the VM prior to the user's extension number when the transferred call goes to an extension that is in a busy call forward mode to the VM group.
	No_Ans Fwd.		Null	This prefix is sent to the VM prior to the user's extension number when the transferred call goes to an extension that is in a no answer forward mode to the VM group.
	DND Fwd.		Null	This prefix is sent to the VM prior to the user's extension number when the transferred call goes to an extension that has DND enabled to the VM group.
	LN Recall		Null	
	UCD Overflow		Null	This prefix is sent to the VM prior to the UCD group transferring a call from overflow to the VM group.
	Record Dgt		Null	
	Clear Msg			
	ICM Suffix			
	XFER Suffix		Null	
	DIS Digit		Null	

Table 3-7: Line Application Programming Table

	LINE APPLICATION	Range	Default	Description
1.	TRUNK ROUTE			System allows 24 different trunk groups.
	Trunk Route	01-24	-	Select a trunk group number.
	PBX Code	0-9	9	Trunks programmed as PBX type, the PBX code is not subject to Toll Restriction.
	PCS Sending	Y/N	Y	The periodic Clearing Signal (PCS) allows the calling party to hang-up and immediately terminate the CO call.
	Hunt Method	SEQL/RAN/SEQF	SEQL	Determines order that trunks are selected. SEQF=lst trunk in group SEQL=sequential from last trunk RAN=random from last trunk used
	Alternate Route			
	Alter Route	1/2	-	2 alternate routes are used when all trunk routes are busy.
	Route Number	01-24	-	Enter route number used as alternate.
	Delete Digits	0--9	0	Up to 16 digits may be deleted from dial string. (May be used to access long distance providers.)
	Inserted Digits	-	-	Up to 16 digits may be inserted from dial string. (May be used to access long distance providers.)
	DIR # SWAP 9			This option reassigns the directory number for the trunk route.
	Swap With	-	-	Not programmable as this time.
2.	T1 CARD			System allows 24 T1 lines.
	Parameter Set			
	Framing Type	D4/ESF	D4	
	Encode	AMI/B8ZS/None	AMI	
	Signal	DTMF/Pulse	DTMF	
	DID Length	3-10	3	
	Dial Tone	Y/N	Y	
	Remote Station			
	Leading Number	1-9	-	
	Route Number	0-24	0	
	° Delete Digits	0--9	0	

Table 3-7: Line Application Programming Table

	LINE APPLICATION	Range	Default	Description
2.	° Inserted Digits	-	-	
	Channel Type			
	Show Line	772-795	-	Enter valid T1 line number.
	Chan Type	Loop/Ground/ DID/I_E&M/ W_E&M/None	Loop	
	ANI	N/Y	N	
	Trans Tab Assign			Translation Table Assignment
	Show Tenant	1-6	-	
	° To Increase	0-150	150	(To lower value, go to Decrease table values)
	° To Decrease	150-0	150	(To lower value, go to Increase table values.)
	Trans Tab Prog			Translation Table Programming
	Show Tenant	1-6	-	
	° Intercept	201-272 301-372 430-453		Enter a valid station or Hunt group number.
	° Digit Interval	01-99	-	
	° Incom	-	-	Incoming number
	° Dest	-	-	Hit [chg] then enter desired station or Hunt group number.
3.	ICLID			In order for the ICLID feature to operate the RS232-1 port must be set for ICLID. Attendant programming (F#0) is used to enable the port function.
	Line Number Tab.			Cross-references the trunk directory number to the number provided from the Caller ID box.
	Show Line	700-771	-	
	Line Number	0-72	0	

Table 3-8: System Application Programming Table

	SYSTEM APPLICATION	Range	Default	Description
1.	RING SCHEME	0-4	2	
2.	LETTER TYPE	0-7	0	Not applicable - do not change.
3.	HOUR MODE	12/24	24	Select standard or military time.
4.	POSITION TO DIR	Example: 1-04-01=station 201		This setting is used to change station/CO line numbers per their physical location. Enter position as Cabinet/Slot/Port. (Cabinet number will always be number 1.)
	Dir Number			Displays DIR number of port at specified address.
5.	DIR TO POSITION			Enter valid DIR number of a station/line.
	Position			Displays physical location of specified DIR number.
6.	NUMBERING PLAN			
	Trunk Route			The 24 trunk routes can be accessed using the 5 different programmable directory numbers.
	Length	1-4	1	The length of the directory number can be from 1 to 4 digits.
	Leading	1-4 (1-9)	9	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Sta Dir Number			Stations can be accessed using up to 9 different directory numbers.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	2 and 3	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Sta Page Group			The 24 Page groups are accessed using the following directory numbers.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	40, 41, 42	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.

Table 3-8: System Application Programming Table

	SYSTEM APPLICATION	Range	Default	Description
6.	Sta Hunt Group			The 24 UCD groups are accessed using the following directory numbers.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	43, 44, 45	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Sta Pickup Group			The 24 Pickup groups are accessed using the following directory numbers.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	46, 47, 48	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Indiv Abbr Number			The individual speed dial numbers are accessed using the following directory numbers.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	5	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Common Abbr Number			The common speed dial numbers are accessed using the following numbers.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	6	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Line Dir Number			Each trunk has a unique access number that is accessed by dialing the following directory number.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	7	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.

Table 3-8: System Application Programming Table

SYSTEM APPLICATION		Range	Default	Description
6.	Music Source			The music circuits are used for background music. The circuits are accessed using the following directory number.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	8	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Loud Bell			The loud bell circuits are accessed using the following directory numbers. The directory number is used in the answering position to signal a loud bell.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	81	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	External Pager			The external paging circuits are accessed using the following directory number.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	82	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Virtual Number			Not used at this time.
	Length	2-4	3	The length of the directory number can be from 2 to 4 digits.
	Leading	1-4 (1-9)	83, 84, 85	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Operator Code			The following code is used to access the station programmed as the attendant.
	Length	1-4	1	The length of the directory number can be from 1 to 4 digits.
	Leading	1-4 (0-9)	0	Any digit 0-9 can be used as the leading digit as long as it does not conflict with existing numbers.

Table 3-8: System Application Programming Table

SYSTEM APPLICATION		Range	Default	Description
6.	LCR Code			This code is used to access the LCR feature
	Length	1-4	1	The length of the directory number can be from 1 to 4 digits.
	Leading	1-4 (1-9)	1	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
	Account Code			The code is used for entering account codes and this code is considered the first digit of the account code.
	Length	1-4	1	The length of the directory number can be from 1 to 4 digits.
	Leading	1-4 (1-9)	Null	Any digit 1-9 can be used as the leading digit as long as it does not conflict with existing numbers.
7.	SUFFIX CODE			
	ICM Ring/Voice	1-#	*	Used to switch between voice and tone ringing.
	DND Override	1-#	3	Used to override a station in DND.
	Camp On	1-#	4	Used to camp on to a station.
	Call Back	1-#	#	Used to auto-call back a busy station.
	Call Pickup	1-#	6	Used to pickup a ringing call in the same pickup group.
	Intrusion	1-#	8	Used to intrude on a station being called. The station must be programmed to allow intrude and the called station needs to have intrusion enabled.
	Msg Waiting	1-#	9	Used to set message waiting to the station being called.
	ICM OHVA	1-#	0	N/A.

Table 3-8: System Application Programming Table

	SYSTEM APPLICATION	Range	Default	Description
8.	ABBR. NO. ASSIGN. (Speed Dial)			Abbreviated Numbering Assignment (used to program speed dial location allocation)
	Individual			Personal speed dial bins
	Show Sta	-	-	Enter station number.
	° To Increase	0-50	0	Use setting to allow number of speed bins per station. (Go to next setting to reduce number.)
	° To Decrease	50-0	50	Use setting to allow number of speed bins per station. (Go to previous setting to increase number.)
	Common List	-	-	System speed bins
	Show Tenant	1-6	-	Enter tenant group.
	° To Increase	0-1000	100	Use setting to allow number of speed bins per tenant group. (Go to next setting to reduce number.)
	° To Decrease	1000-0	100	Use setting to allow number of speed bins per tenant group. (Go to previous setting to reduce number.)
9.	CO LINE COPY			The system allows for copy of the line features from port to port. Features copied: Tenant Group, Route, Day & Night COS, Dialing Mode Trunk Type, Call Abandon Private and Answering Position.
	Individual Copy	-	-	Used to copy a single line setting to another line or lines, one line at a time.
	Copy From	-	-	Enter valid trunk number to be used as template.
	Copy To	-	-	Enter valid trunk number to be changed.
	Group Copy	-	-	Copies settings from individual line to trunk group.
	Copy From	-	-	Enter valid trunk group number to be used as template.
	Copy To	-	-	Enter valid trunk group number to be changed.

Table 3-8: System Application Programming Table

	SYSTEM APPLICATION	Range	Default	Description
10.	STATION COPY			The system allows fro copy of the station features from port to port. **This option DOES NOT copy Feature keys or Dial Number Swapping.**
	Individual Copy	-	-	Used to copy a single station's setting to another station or stations, one line at a time.
	Copy From	-	-	Enter valid station number to be used as template.
	Copy To	-	-	Enter valid station number to be changed.
	Group Copy	-	-	Copies settings from an individual station to a station pickup group.
	Copy From	-	-	Enter valid station number to be used as template.
	Copy To	-	-	Enter valid station pickup group number to be changed.
11.	FEATURE COPY			Used to copy Feature key programming from station to station. Must be same keyset type (Executive/Enhanced).
	Copy From	-	-	Enter valid station number who's keys will be used as the template.
	Copy To	-	-	Enter valid station number who's feature keys are to be changed.
12.	NITE SERVICE STA			Each tenant group may be assigned up to 5 extensions to be used for nite service.
	Show Tenant	1-6	-	Enter valid tenant group number.
	Member (1-5)			Up to five members may be assigned to each tenant group.
13.	SYSTEM TIME			
	Year	00-99	0	
	Month	01-12	JAN	Press [chg] to scroll though month.
	Day	01-31	01	
	Weekday	SUN-SAT	SUN	Press [chg] to scroll though days.
	Hour	00-23	01	
	Minute	01-59	00	

Table 3-8: System Application Programming Table

	SYSTEM APPLICATION	Range	Default	Description
14.	NIGHT SWITCHING			To define the system night switching time.
	Show Tenant	1-6	-	Each tenant can be programmed with their own night switching mode settings.
	Follow Tenant1	Y/N	Y	Tenants 2-6 can be set to follow Tenant1 settings.
	Sunday-Saturday			Each day of the week can have a Day/Night start time.
	° Day Time	00:00-23:59	08:00	Day mode is in force until Night Time setting is reached.
	° Night Time	00:00-23:59	17:00	

Table 3-9: Maintenance Application Programming Table

	MAINTENANCE Application	Range	Default	Description
1.	LOG_ON DATA			Database plays the date, time, and last method used to connect to the system.
	(Current Date/Time)			
2.	ACTIVE ALARM	Y/N	Y	
3.	ALARM ATTEMPT	1-10	3	The number of times the system attempts to notify in the event of an alarm.
4.	FIELD ENGINEER			
	CPSWD2	Field Engineer= Engineer#	-	Enter *Engineer#* as the password.
	Site	NN+AAAA	-	Enter 2 digits and up to 4 alpha letters.
	° Built_In Modem	-	-	Modem information
	»» Directory #200	-	200	DIR number is not programmable.
	»» Baud Rate	600-2400	1200	For Maintenance, baud rate should be 600 or 1200.
	° Microcode Rev.			
	»» Show Module	1	-	
	»» Common Ctrl Bd.			Common Control Board
	»»» S/W	-	-	Displays current software version of main control board.
	»»» H/W	-	Null	Hardware

Table 3-9: Maintenance Application Programming Table

	MAINTENANCE Application	Range	Default	Description
4.	»» TAC/MAC Card			Tone analyzer card.
	»»» S/W	-	-	Displays current software version.
	»»» H/W	-	Null	Hardware
	»» Slot Position	4-12	-	Enter a slot number.
	»»» S/W	-	--	Displays firmware version of card in designated slot.
	»»» H/W	-	Null	Hardware
	»»» Type	-	-	Displays type of card (e.g., ext=digital station card, AEI=single line board).
	° Facility Blocking			
	»» Sta Blocking			
	»»» Show Sta	-	-	Enter valid station number.
	»·» Blocking	Y/N	N	Press CHG to block/unblock the station.
	»» Line Blocking			
	»»» Show Line			Enter valid CO line.
	»·» Blocking	Y/N	N	Press CHG to block/unblock the CO Line.
	»» Show Module	1	1	Not programmable
	»»» Slot Position	3-12	-	Enter slot number of desired card to be blocked.
	»·» Blocking	Y/N	N	Press CHG to block/unblock the card.
	° Line Status			Displays status of line in the system.
5.	DEALER			
	C PSWD3	Dealer=Dealer###	-	Enter *Dealer###* as the password.
	Traffic Recording			
	° Message Queue			
	»» Usage		50/50	Number of Message Queue available.
	»» CBCK Queue		25/25	Number of CBCK Queue available.

Table 3-9: Maintenance Application Programming Table

MAINTENANCE Application		Range	Default	Description
6.	SERVICE CENTER			
	C PSWD4	Service=Service##	-	Enter *Service##* as the password.
	System Type	72/48	72	Reserved function / NA for DHS-L.
	Auto Log-Off	10-60	20	Length of time that the programming keyset remains inactive before being logged off.
	Log-On Again	0-60	30	Length of time that any keyset user must wait to enter Database Programming after 3 consecutive incorrect passwords have been entered.
	Direct Addressing			
	° Addr.			Enter the memory address in (segment: offset) format.
	° Content			Show the content of that memory.
	Warm Start			Perform the software restart.
	Cold Start			Perform the software restart.

Table 3-10: Diagnostics Application Programming Table

DIAGNOSTICS Application		Range	Default	Description
1.	ERR CODE DESCRP			Error Code Description
	1:Sys Restart	1-4	3	System restart
	2:Data Mem Er	1-4	2	Data Memory Error
	3:Pgm Mem Er	1-4	1	Program Memory Error
	4:Watchdg Tmt		2	Watchdog Time cut
	5:Checksum Er	1-4	1	Check Sum Error
	6:Brd Missing	1-4	2	Board Missing
	7:Serial C Er	1-4	3	Serial Communication Error
	8:Spi Failure		2	SPI Communication Error
	9:Tone Det Er	1-4	3	Tone Detection Error
	10:Loop Det Er	1-4	3	Loop Current Detection Error
	11:Dgt Det Er	1-4	3	Digit (DTMF) Detection Error
	12:CIL Comm Er	1-4	2	CIL Communication Error

Table 3-10: Diagnostics Application Programming Table

DIAGNOSTICS Application		Range	Default	Description
1.	13:Illegal Pwd	1-4	4	Illegal Password (3 rejected attempts)
	14:Rt Test Er	1-4	2	Routine Test Fault
	15:Alrm X Fail	1-4	4	Alarm Transfer Failure
	16:Act Alrm Di	1-4	1	Active Alarm Disable
2.	HARDWARE SELFTST			
	Test Time		Null	Determines time of day hardware test will run. (military format)
	Test Status			
	Show Module	1	1	Always 1
	(displays status)			

Database Programming Procedural Flow

The flowchart on the following pages can be used as a guide when performing database programming. There are four programming functions as shown in *Figure 3-2: Database Programming Functions—Station and CO Line*. Details of these programming functions are shown in the subsequent figures. Please note the following conventions used in the flowchart are similar to the soft buttons previously listed:

back: returns to the previous item

next: moves to the next item

show: moves to the first item

hold: returns to the beginning (unless noted)

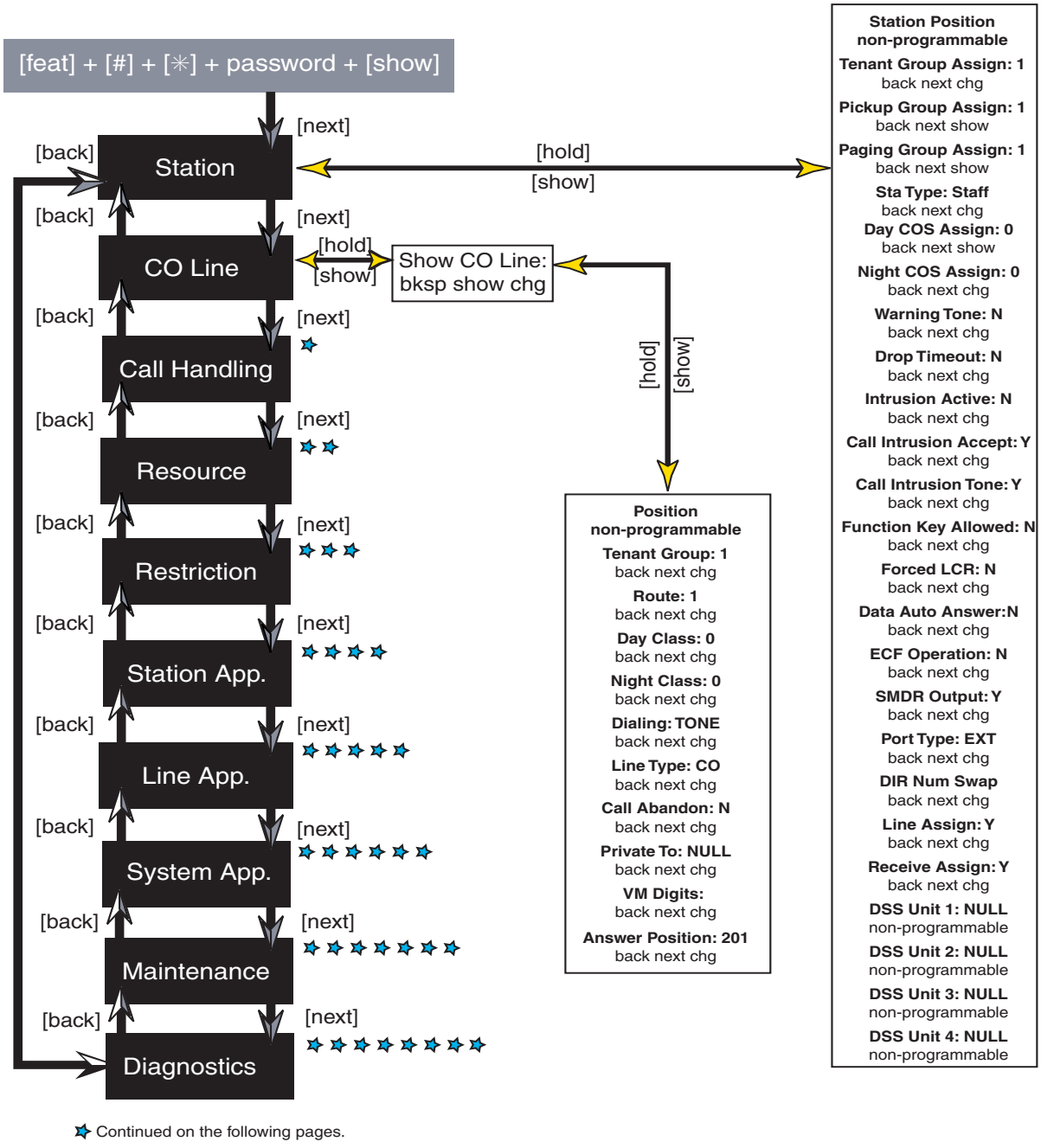


Figure 3-2: Database Programming Functions—Station and CO Line

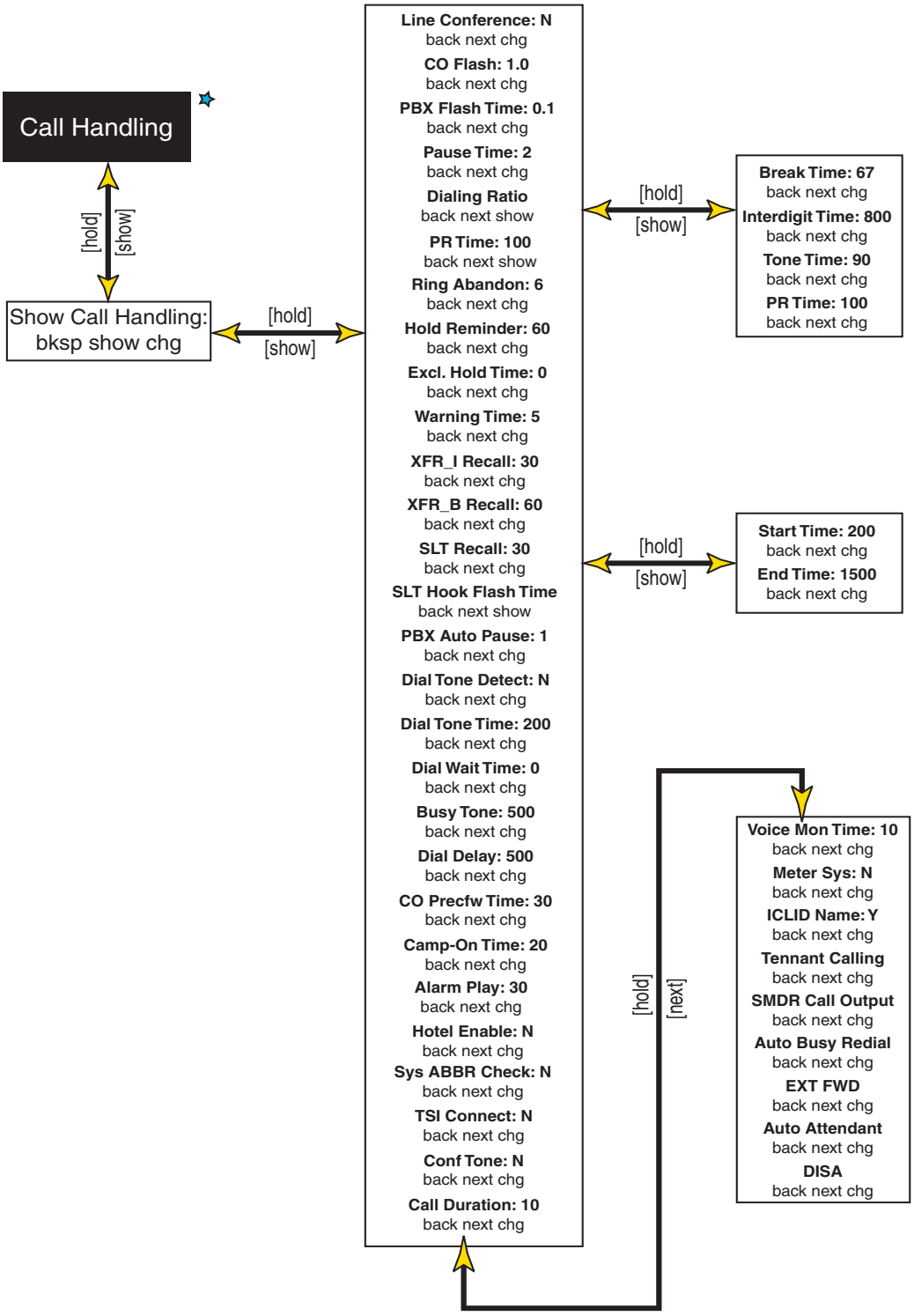


Figure 3-3: Database Programming Functions—Call Handling

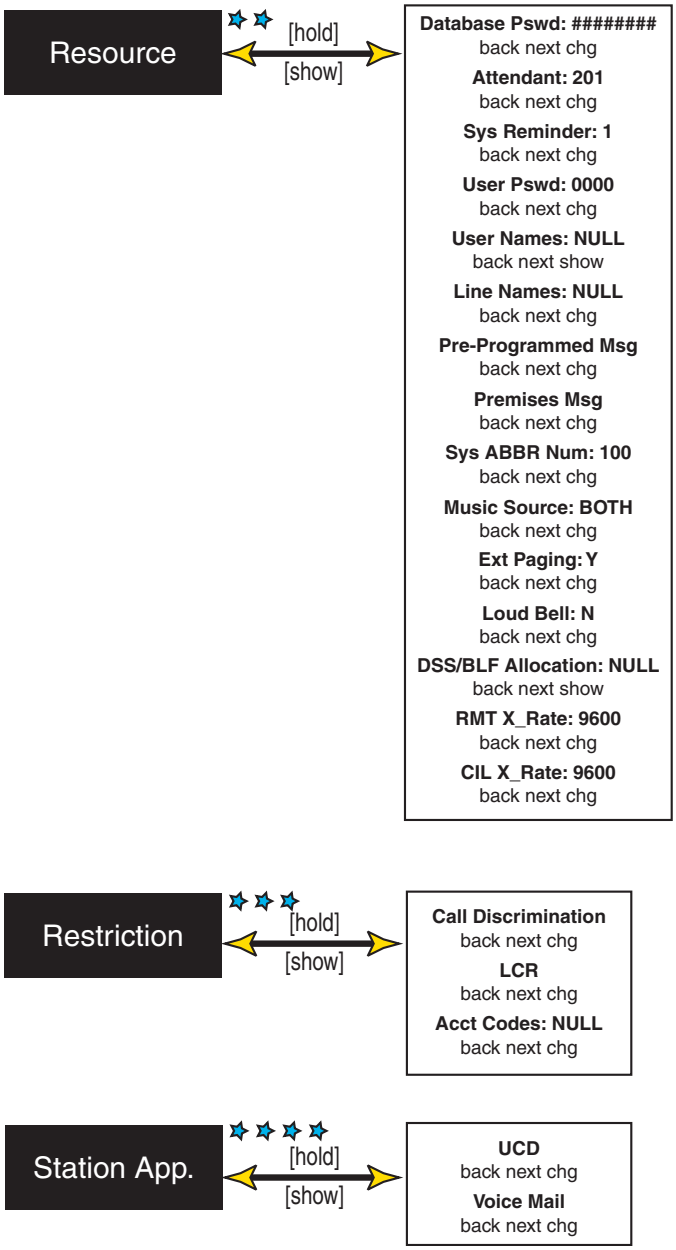


Figure 3-4: Database Programming Functions—Resource, Restriction and Station App.

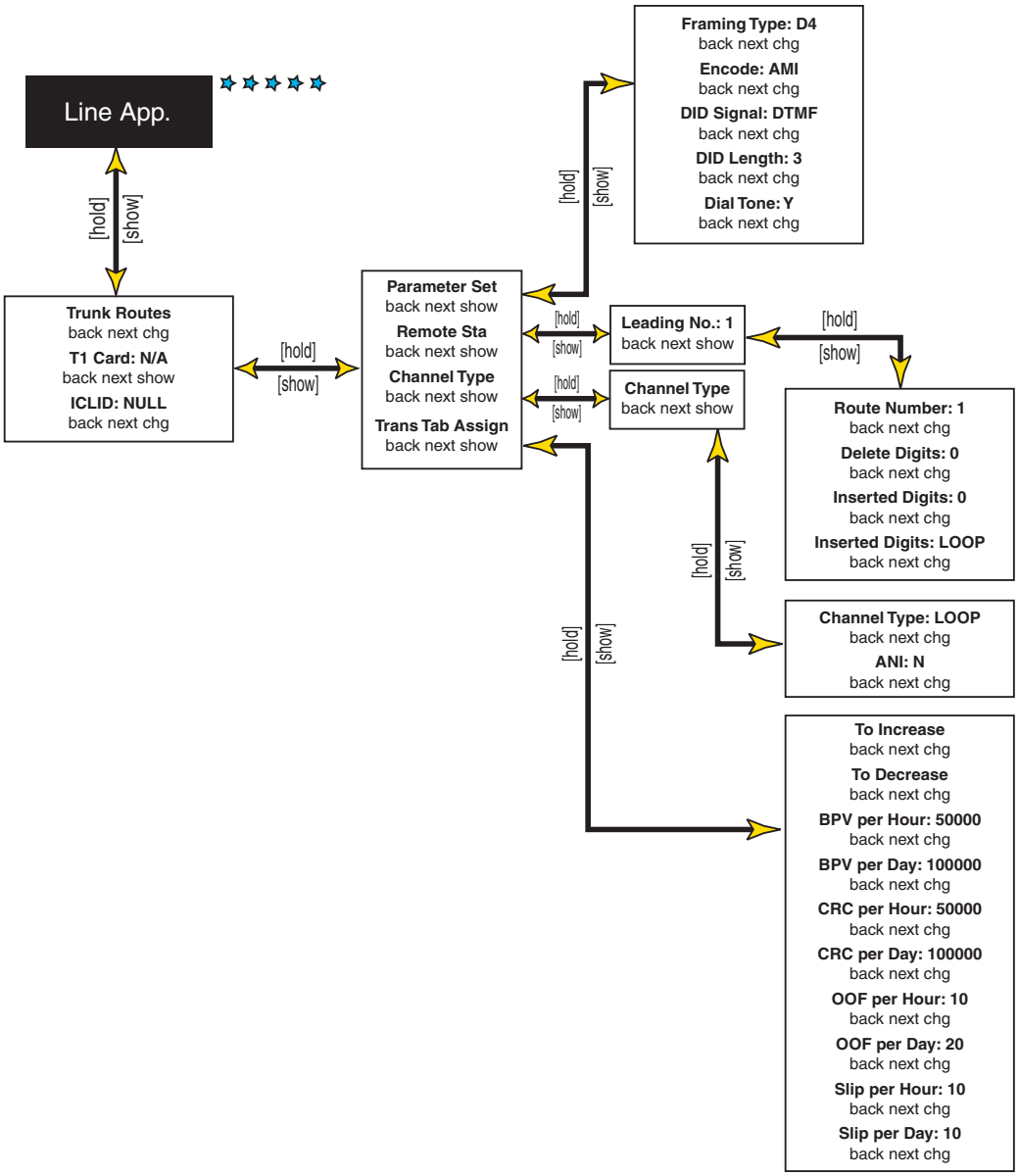


Figure 3-5: Database Programming Functions—Line App.

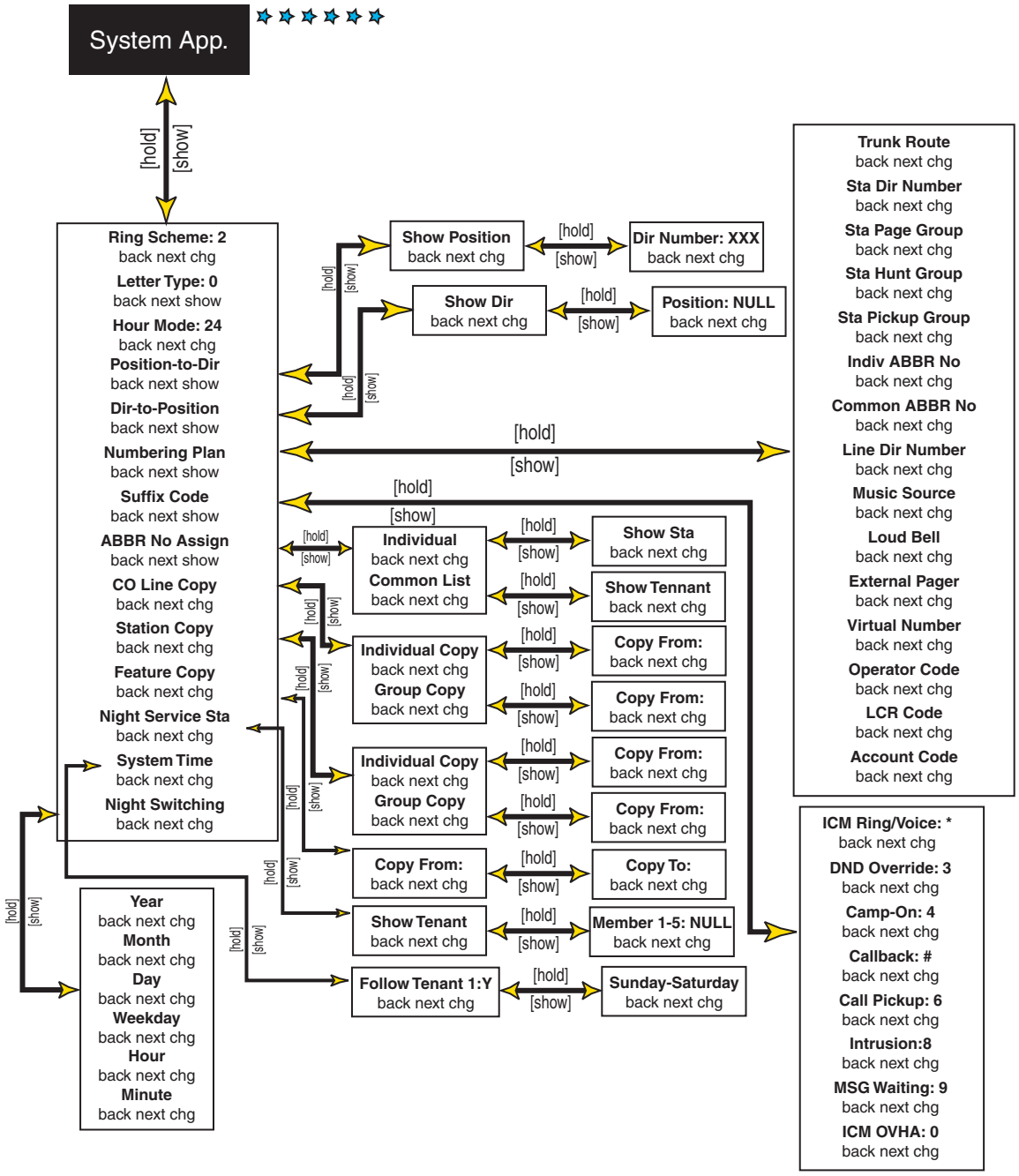


Figure 3-6: Database Programming Functions—System App.

Feature Code Table

Table 3-11: Feature Access Codes

Feature	LCD	Non-Display
ALARM CLOCK		
Cancel (prior to alarm)	F+[✳]+[9]+[2]	F+[✳]+[9]+[2]
Extension	F+[9]+[2]	F+[9]+[2]+HHMM+(1-2)
ATTENDANT ADMINISTRATION	F+[#]+[0]+(1-6)+[save] +password (0000)	N/A
AUTOMATIC BUSY REDIAL (ABR)	F+[7]+[8]	F+[7]+[8]
BACKGROUND MUSIC		
Enable	[800] or [801]	[800] or [801]
Disable	[CLEAR]	[CLEAR]
CALL ANNOUNCE		
Allow (hands-free)	F+[9]+[8]	F+[9]+[8]
Cancel	F+[✳]+[9]+[8]	F+[✳]+[9]+[8]
CALL BACK	[Ext]+[#]	[Ext]+[#]
Cancel (All)	F+[#]+[#]	F+[#]+[#]
Cancel (Single)	F+[✳]+[#]+[#]+extn nbr	F+[✳]+[#]+[#]+ext number
CALL FORWARD		
All	F+[2]	F+[2]+[2]+(station)
Busy	F+[2]	F+[2]+[1]+(station)
Cancel	F+[2]	F+[✳]+(fwd type)
DND (Transfer)	F+[2]	F+[2]+[7]+(station)
DND (to Attd while ringing)	F+[4]	F+[4]
External	F+[2]	F+[2]+[6]+(extrnl nbr)+ [HOLD]
Follow To	F+[2]	F+[2]+[5]+(station)
Follow Me	F+[2]	F+[2]+[3]+(station)+(psswrd)
Follow Me Cancel	F+[2]	F+[✳]+[2]+[3]+(station)+(psswrd)
No Answer		F+[2]+[4]+(station)+[xx]
CALL PARK		
Receive	F+[7]+[3]	N/A

Table 3-11: Feature Access Codes

Feature	LCD	Non-Display
CALL PICKUP		
Direct	[Ext]+[6]	[Ext]+[6]
Group	(station)+(460-489)	(station)+(460-489)
CAMP ON		
Busy CO Line	[Ext]+[4] ???	[Ext]+[4] ???
Busy Station	???	???
CO LINE		
Automatic Selection	F+[9]+[5]	F+9+5+(0 or 1)
CONFERENCE		
Supervised	F+[6]+[0]	F+[6]+[0]
Forced Release	F+[7]+[4]	F+[7]+[4]
Talk Privately		
Unsupervised (CO Line Conference)		
Unsupervised (CO Line Conference Rejoin)		
DATABASE PROGRAMMING	F+[#]+[✳]	N/A
DAY/NIGHT MODE	F+[6]+[3]	N/A
DISTINCTIVE RING	F+[#]+[7]	F+[#]+[7]+(1-4)
DO NOT DISTURB (DND)	F+[4]	F+[4]
DSS/BLF KEY PROGRAMMING	F+[#]+[4]	N/A
FEATURE BUTTON		
Key Programming Numbers	F+[#]+[3]	F+[#]+[3]+(programmable btn) +[1]+(directory nbr)+[HOLD]
Feature Codes	F+[#]+[3]	F+[#]+[3]+(programmable btn) +[2]+[FEAT]+(code)+[HOLD]
Inquiry	F+[#]+[3]	N/A
Erase	F+[#]+[3]	F+[#]+[3]+(programmable btn) +[HOLD]
FLASH		
CO Line	F+[3]	F+[3]
HOLD		
Automatic Allow	F+[9]+[4]	F+[9]+[4]
Cancel	F+[✳]+[9]+[4]	F+[✳]+[9]+[4]

Table 3-11: Feature Access Codes

Feature	LCD	Non-Display
HOT DIAL PAD		
Allow/Deny (toggles)	F+[#]+[6]	F+[#]+[6]
HOT LINE	F+[9]+[✳]	F+[9]+[✳]
Cancel	F+[✳]+[9]+[✳]	F+[✳]+[9]+[✳]
INTRUSION (Privacy)	F+[5]+[7]	F+[5]+[7]
LAST NUMBER REDIAL (LNR)	F+[8]	F+[8]
MESSAGE WAIT	[Ext]+[9]	[Ext]+[9]
Answer		
Cancel (incoming)	[F]+[✳]+[9]+[6]	
Cancel (sent)		[F]+[✳]+[9]+[6]
MUTE	F+[7]+[6]	F+[7]+[6]
Muted Ringing		
PAGE		
Internal (All Groups)		
External		
All Call (Internal)		
Group		
Answer	F+[5]+9]	F+[5]+9]
Station (Allow/Deny)	F+[#]+[9]	F+[#]+[9]
PAUSE	F+[7]+[0]	F+[7]+[0]
SAVE DIALED NUMBER (SDN)	F+[5]+[1]	F+[5]+[1]
SPEED DIAL		
To Store	F+[#]+[1]	F+[1]+bin number+ telephone number+[HOLD]
To Dial	(Station: 500-549, System: 600-699)	(Station: 500-549)
To Erase		
STATION		
Feature Status	F+[#]+[8]	N/A
Lock/Unlock	F+[9]+[7]	F+[9]+[7]
Change Password		

Table 3-11: Feature Access Codes

Feature	LCD	Non-Display
TRANSFER		
One-Button	pre-programmed [DSS] btn	
Screened	[HOLD]+station/Hunt group nbr (wait for answer)+[TRANS]	
Unscreened	[HOLD]+station/hunt group nbr+[TRANS]	
Voice Mail	[HOLD]+(VM Hunt grp nbr)+mailbox nbr+[TRANS]	
UCD AGENT LOGON	F+[✳]+[9]+[1]	
UCD AGENT LOGOFF	F+[9]+[1]	
USER SAVED NUMBER REDIAL (USNR)	F+[5]+[✳]	N/A
VOICE MAIL - CALL SCREEN	F+[6]+[4]	F+[6]+[4]
VOICE RECORDER	F+[6]+[7]	F+[6]+[7]

System Numbering Plan

Table 3-12: System Numbering Plan

Parameters	Number/Range
Call Pickup Group	460-483
CO Line Access	700-771
Common Speed Dial Number Access	600-699
Extension 1--> B2-->	201-272 301-372
External Paging	820-821
LCR	1
Loud Bell	810-811
Music Source	801 or802
Paging Zone Access	400-425
Personal Speed Dial Number Access (ABBR number)	500-549
Station Hunt Group	430-453
T1 Channel Access (CO Line numbers)	772-795
Virtual Number Access	830-859

ADP Modular Jack

Description

All key telephone types are equipped with an Analog Device Port (ADP) jack. The ADP jack is an open, twisted-pair conductor path that may be extended from the KSU via the second pair of the station cabling. The ADP may be used to extend a SLT system station port or CO line to the digital key telephone desktop for convenient connection of any analog interface device (answering machine, modem, facsimile machine, etc.).

The ADP jack of any telephone may be wired for connection to the main telephone CO line for use as a power failure standard telephone interface in the event of a power outage.

The standard 2-pair key telephone mounting cord (line cord) provided with each key telephone extends the second station cable pair to the key telephone ADP jack. Any analog device connected to the ADP jack operates independently of key telephone operation.

Alarm Clock

Description

You may activate your own private alarm on your telephone to remind you of special appointments, events, wakeup calls, etc. When the alarm activates, you will hear tone ringing for 6 seconds. After the 6 seconds, the alarm is automatically canceled.

Operation

ENHANCED TELEPHONES –

To turn ON a signaling alarm:

1. Press [FEAT].
2. Dial [9] + [2].
3. Dial HHMM where HH is hour, MM is minute (24-hour clock).
4. Press [1] for one time, or [2] for always. When the alarm time is reached, you will hear tone ringing.

To turn OFF a signaling alarm:

Pickup the handset and replace.

To cancel the alarm clock feature prior to alarm activation:

1. Press [FEAT].
2. Dial [✳] + [9] + [2].

EXECUTIVE TELEPHONES –

To turn ON a signaling alarm:

1. Press [FEAT].
2. Dial [9] + [2].
3. Press CHG.
4. Dial HHMM where HH is hour, MM is minute (24-hour clock).
5. Press [SAVE].
6. Press soft button 1 for one time activation, or soft button 2 for always.

To turn OFF a signaling alarm:

When the alarm time is reached, you will hear tone ringing and the display will show:

ALARM REACHED
ack

Press [ack].

To cancel the alarm clock feature prior to alarm activation:

1. Press [FEAT].
2. Dial [✳] + [9] + [2].

Conditions

- The alarm clock will be canceled automatically after the alarm time is reached.
- The Executive Telephone display will be unchanged until [ack] is pressed or when the telephone is used for another call.

Attendant

Description

One primary attendant is provided in the system for support of necessary services like Line Recall, Forced Incoming Intercom Call Forward and Manual Night Service operation. A second, or alternate, attendant position may be established. Each tenant group can have its own secondary attendant.

The attendant may establish a private personal password for control of the system service mode (Day/Night/Time), Time Of Day settings and System Speed Dial number programming. One valid station number must be assigned to serve as the attendant.

Station 201 is the default Attendant Position and is assigned CO line ringing for all CO lines.

Programming

One station may be assigned the attendant station. This station will receive all recall indications and calls not properly routed.

Default

The *DHS-L* default settings and Station Attendant ranges are:

- Attendant Station = 201

Programmable Range:

- Attendant = 201-272 and 301-372

The *DHS-L* Operator Code is [0], and the programmable value can be toggled to 0 or 9.

Conditions

- The Attendant's personal 4-digit password is used by the attendant (or any other station) to perform System Administration functions (Service Mode, Time of Day, System Speed Dial programming).

Attendant Administration

Description

Attendant Administration is used to set the features Service Mode (Day/Night/Time). You may enter into Attendant Administration using the password of the assigned system Attendant telephone.

Operation

1. Press [FEAT].
2. Dial [#] + [0]. The display shows:

```
TENANT GROUP  :__
 bksp  save   chg
```

3. Dial [1-6].
4. Press [save].
5. Enter password (0000).
6. Press [show].

System Service Mode

1. Press [svc]. The display shows:

```
SERVICE MODE CHG
 back  next  show
```

2. Press [show] to select between DAY1, DAY2, DAY3, NIGHT, and TIME.
3. Press [CLEAR] to exit programming or [back] to change other features.
4. Press [next] to select RS-232, then select between RMP or ICLID.

Automatic Busy Redial (ABR)

Description

Automatic Busy Redial (ABR) may be used to redial the last number. The system will automatically dial the number and then monitor the line for a busy signal. If a busy signal is detected, the system ends the call and attempts to dial the number again. The redial cycle will continue until the maximum number of attempts designated in programming is reached.

Operation

1. Press [FEAT].
2. Dial [7] + [8]. An Executive Telephone will display:

```
CO LINE X
 - ->01/08
```

The system will continue redial attempts until busy tone is no longer detected, or the maximum number of attempts is reached, or any other feature is used on the telephone.

Programming

The Auto Busy Redial function will attempt to Redial a specified number of times. Three data fields are programmed for ABR operation:

- ABR Attempts
- ABR INTERVAL
- TONE DET. TIME

The ABR ATTEMPTS determines how many attempts will be made to reach a busy number before the system aborts the feature. The ABR INTERVAL determines how often attempts are made (time between attempts).

Default

The default settings for the *DHS-L* three ABR data fields are listed below:

- ABR Attempts = 8 (no attempt = 0)
- ABR Interval = 60 sec
- TONE DET. TIME = 4

The programmable range of ABR data fields are listed below:

- ABR Attempts = 0-99
- ABR Interval = 30/60/90/120 sec
- TONE DET. TIME = 0-9

Background Music

Description

When your telephone is idle and the feature is enabled and activated, you can hear background music (BGM) through the speaker. You can use the feature code to select between BGM Channel 1, BGM Channel 2 (if the system is so equipped), and No BGM. The BGM automatically turns OFF when you receive or make a call. BGM turns on again when the telephone is idle.

Operation

To activate Background Music:

1. Dial [801 or 802].
2. Press [clear] to end BGM (idle).

If a feature button is programmed for BGM, the lamp for that button will not light to indicate BGM is activated. Hearing the BGM will be your confirmation that the feature is activated. The DHS-L supports 2 BGM Channels.

Programming

A second music source may be connected to the system for listening at key telephone stations. If this source is not used it may be desirable to disable that BGM channel. When BGM is set to N the second music source will not be connected to a station that has toggled the BGM code [801 or 802], only the first music channel source, such as Music on Hold (MOH), will be toggled at the telephone.

When set to Y both music channels will be toggled by successive operations of the BGM code [801 or 802].

Default

The *DHS-L* BGM is set to N.

Busy Lamp Field (BLF)

Description

Depending on user requirements, any Programmable Feature Button can be programmed as a Busy Lamp Field (BLF) button to monitor a station's status. When the programmed station is off-hook or in Do Not Disturb (DND), the button LED will light red. This same button is used as a one-button Direct Station Selection (DSS) call button for quick inside calling.

Each station has a default feature button mapping, refer to Chapter 2, DHS-L Description and Installation, to determine the default map of the telephone models.

Combination DSS/BLF

Description

Any feature button may be programmed as a combination DSS/BLF button. The DSS/BLF button allows you to call a specific station with the touch of one button. This same button will light whenever the associated station is busy (off-hook) or in the Do Not Disturb mode.

Call Abandon

Call Abandon is a CO line setting that monitors the CO line for distant party hang up. When set to"Y" the *DHS-L* will monitor that CO line throughout the call duration for interruption in loop current. When an interruption occurs that is at least as long as the programmed Call Abandon Time, the system recognizes that interruption as distant party disconnect and forces the CO line on-hook.

Programming

Call Abandon Time is set for 2 modes ACTIVE CALL and HELD CALL. This time represents the minimum interruption in loop current during these modes of operation that must be detected to force a CO line on-hook. Any CO line marked Call Abandon Y will follow the associated timer programming.

Default

The *DHS-L* ACTIVE CALL and HELD CALL fields are both set for 600 msec, and the variable range for both is 50 -2500 msec.

DHS-L Call Abandon is set to N for all CO Lines, and can be toggled from Y/N.

This feature is especially useful with Voice Mail operation because the system will send disconnect digits to a VM port when loop current interruption is detected.

CALL ABANDON MUST BE SET TO (N) FOR RELIABLE VOICE MAIL DISCONNECT.

Call Announce

Description

This feature provides several beeps to alert you of an incoming intercom call. After the beeps, the telephone is automatically connected to the intercom in a hands-free mode.

Operation

To enable Call Announce:

Press [FEAT] + [9] + [8].

To cancel Call Announce:

Press [FEAT] + [✳] +[9] + [8].

Call Back

Description

This feature allows you to queue a station which is busy, in Do Not Disturb (DND), or idle. When you send a Call Back to a busy station, the Call Back process will begin when the busy station hangs up. When you send a Call Back to an idle station, the Call Back process will begin once the user performs an operation at that station and then hangs up. When the Call Back process begins, you will hear bursts of tone signaling you to pick up the handset or press [SPKR]. Then the queued station begins ringing.

Operation

Call the station that you want to queue. An Executive Telephone will display the following according to the status of the telephone you are calling:

When station you are calling is in Tone Ringing mode.

```
CALLING          STA   xxx
 cbck    msg
```

When station you are calling is busy.

```
 STA   xxx   BUSY
 cbck    msg     next
```

Press soft button for callback.

```
 STA   xxx   WAIT
 cbck    msg
```

ENHANCED TELEPHONES –

To send a Call Back:

1. Press [EXT].
2. Dial [#].

To answer a Call Back:

When the Call Back process begins, your telephone will ring a special Call Back ring for 30 seconds. Lift the handset or press [SPKR].

EXECUTIVE TELEPHONES –

To answer a Call Back:

1. When the Call Back process begins your, telephone will ring a special Call Back ring for 30 seconds. The display will show:

```
CALL BACK TO  xxx
      reply    del
```

2. Lift the handset or press [SPKR],

   -or-

   Press [reply] to continue the Call Back. The display will show:

```
CALLING STA  xxx
  cbck msg
```

3. If you press [del] in Step 2, the Call Back will be canceled and the display will show:

```
CALL BACK DELETE
```

Cancel

To cancel an All Call Back request (Enhanced/Executive Telephones):

Press [FEAT] + [#] + [#].

To cancel a Single Call Back request (Enhanced/Executive Telephones):

Press [FEAT] + [✳] + [#] + [#] + (station number).

Conditions

- The station you are calling must be busy or in the Tone Ringing mode. Call Back will be denied when there is already a Call Back request at the called station.
- Only one Call Back may be initiated at a time.
- To invoke Call Back at a station in Voice Call Allow mode, you must first Force Tone Ringing. At an Executive Telephone, if the Call Back is not answered during the ring reply time, the response message will be displayed until you press [reply] or [del].
- The Call Back process begins when both your telephone and the called party's telephone are hung up.

Call Discrimination

Description

Provides sophisticated monitoring of digits dialed on CO lines. If a digit or range of digits dialed on a CO line does not correlate with the Allow Digit Interval table, the CO line is released immediately. On any non-allowed call, the station user will receive error tone and the CO line button LED will extinguish. At an Executive Key Telephone, the user will see Call Restricted on the LCD. The Toll Restriction Allow Digit Interval table may be constructed in a matrix format and associated to any of the COS. Stations may be assigned a separate COS for Day System Mode operation and Night System Mode operation.

Override

Any CO line may be marked Toll Override Y. When set to Y a restricted station may access that CO line and dial out.

Default

The *DHS-L* Toll Override is marked N (NO).

Call Forward

There are many Call Forward choices:

- Forward calls when your telephone is idle.
- Forward calls when your telephone is busy.
- Use the Follow Me feature to receive calls at a temporary location and activate the feature remotely from another station.
- Forward your calls when there is no answer.
- Combine busy and no answer call conditions for forwarding calls.
- Forward Intercom calls, incoming CO and transferred CO calls.

Regardless of whether the station where calls are being forwarded is a key telephone or single line telephone, the user at the forwarded station will hear special Intercom Reminder tone signifying that Call Forward is activated.

Call Forward Modes

ENHANCED TELEPHONES –

Use these programming code combinations to activate the desired Call Forward feature.

Table 3-13: Call Forward Programming

All Call Forward (DIRECT/FWD)	Press [FEAT] + [2] + [2] + (station number)
Busy Call Forward	Press [FEAT] + [2] + [1] + (station number)
Cancel	Press [FEAT] + [✳] + (fwd code)
DND Forward	Press [FEAT] + [2] + [7] + (station number)
DND Forward (To Attendant)	Press [FEAT] + [4]
External Call Forward	Press [FEAT] + [2] + [6]
Follow To (FOLLOW/FWD)	Press [FEAT] + [2] + [5] + (station number)
Follow Me Call Forward	Press [FEAT] + [2] + [3] + (station number) + (password)
No Answer Call Forward	Press [FEAT] + [2] + [4] + (station number) + [xx]*

* *xx = Time after which call forwards - 10, 20, 30, 40, or 50 seconds*

Display

When any type of station call forwarding is invoked, the LCD display will indicate the call forwarding mode. The display mode is optional; the Call Forward Display defaults to ON.

EXECUTIVE TELEPHONES –

1. Press [FEAT].
2. Then dial [2]. The display shows:

```
CALL FORWARD
direct    busy    next
```

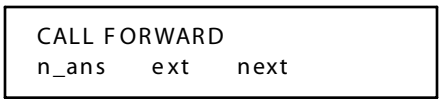
3. Press [direct], the display shows:

```
DIRECT FORWARD          ___
bksp    save    chg
```

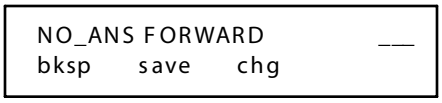
4. Press [busy], the display shows:

```
BUSY FORWARD            ___
bksp    save    chg
```

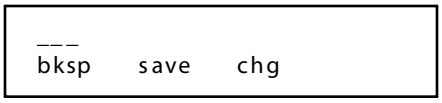
5. Press [next], the display shows:



6. Press [n_ans], the display shows:

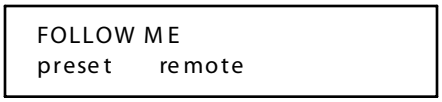


7. Press [ext], the display shows:

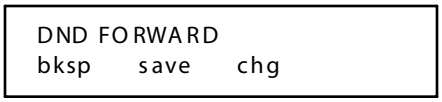


8. Press [next], the display shows:

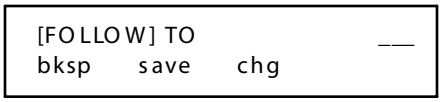
9. Press [follow], the display shows:



10. Press [DND], the display shows:



11. Press [preset], the display shows:



12. Press [remote], the display shows:

13. Press [del], the display shows:

```
[CANCEL]  FM ___
bksp   save   chg
```

14. Press [set], the display shows:

```
[FOLLOW]  FM ___
bksp   save   chg
```

Operation

1. Press [FEAT].
2. Dial [2]. The display shows:

```
CALL FORWARD
 na    busy   next
```

Busy

1. Press [busy]. The display shows:

```
BUSY FORWARD TO --
 bksp  save  chg
```

2. Dial the station number where calls will be forwarded, then press [save].

Busy/No Answer

1. For more forward options press [next]. The display shows:

```
CALL FORWARD
bsy/na  idle   next
```

2. Press [bsy/na]. The display shows:

```
BSY/NA FWD TO   --
 bksp  save  chg
```

3. Dial the station number where calls will be forwarded, then press [save].

External Call Forward

Description

The External Call Forward (ECF) feature allows a station with a ringing assignment to forward all calls to an off-site location.

Programming

1. Press [FEAT] + [2].
2. Press [next].
3. Press [ext].
4. Dial the number to be forwarded to.
5. Press [save].

ECF programming has two data fields:

- SERVICE - Allows feature to operate only during certain system modes of operation.
- TALK TIME - The preset time limit of the ECF call. ECF may be discontinued prior to the expiration of the TALK TIME by the remote party by dialing [0] + [#] at any time during the ECF call, or [0] + [✳] to extend it.

Default

The *DHS-L* default settings of associated ECF data fields are:

- SERVICE = Always
- TALK TIME = 5

Programmable Range - ECF Data Fields

CALL HANDLING (refer to item 35, *"EXTERNAL FWD" on page 3-12*):

- SERVICE = never/day/night/always
- TALK TIME = 1/2/3/5/10/15 minutes.

STATION (refer to item 16, *"ECF OPERATION" on page 3-8*):

- Default = No (Station is not allowed to External Call Forward)

Cancel

1. Any call forward mode can be canceled at the station that is forwarded by pressing [FEAT] + [2]. The display will indicate DELETE FORWARD. Let's assume that you are Station 10 and Station 12 is Busy Call Forwarded to Station 16.
2. Call Station 12, which is busy on another intercom call.
3. Your call is forwarded to Station 16 and you hear ringback tone. At an Executive Telephone, your display shows:

4. If Station 16 is also busy, you will hear a busy tone. At an Executive Telephone the display shows:

```
STA 16 BUSY
cbck   msg   next
```

At Station 16 ringing is heard and the display reads:

```
STA  10 CALLING
          12 CFW
```

Call Forward can be pre-programmed on any feature button. When active, the lamp on the assigned CALL FORWARD button will light on the Enhanced Telephones. On an Executive Key Telephone, the display can be programmed to show the station or group to which it is forwarded.

Conditions

- When Call Forward is active at any telephone, Special (stutter) Dial Tone is heard when the user accesses intercom dial tone.
- Only one type of Call Forward can be active at a station at any time.
- After programming Call Forward, the Call Forward message defaults to display on the LCD.
- Call Forward cannot be programmed for more than three stations in series. For instance, if Station (A) forwards to Station (B) and Station (B) forwards to Station (C), Station (C) cannot forward calls.
- Any number of stations may be programmed for Call Forward to the same destination, simultaneously.
- All Call Forward will forward all intercom calls, regardless of busy/idle state.
- Call Forward No Answer shows a timer value on the display of an Executive Key Telephone which allows the station to adjust the time a call will ring before it forwards. This option remains displayed until some other action is taken at the telephone.
- Follow Me Forward must be canceled at the station where calls were forwarded.

Direct (All Call)

For more forward options press [next]. The display shows:

```
CALL FORWARD
direct          follow
```

1. Press [direct]. The display shows:

```
DIRECT FWD TO
bksp  save   chg
```

2. Dial the station number where all calls will be forwarded, then press [save].

Follow To (from your station)

1. Press [follow]. The display shows:

```
FOLLOW ME
preset    remote
```

2. Press [preset]. The display shows:

```
FOLLOW TO
bksp  save   chg
```

3. Dial the station number from which calls are to be forwarded.
4. Press [save].

Follow Me (from another station)

1. Press [follow]. The display shows:

```
FOLLOW ME
preset    remote
```

2. Press [remote]. The display shows:

```
REMOTE SELECTION
del    set
```

3. Press [set]. The display shows:

```
FOLLOW FROM    ___
bksp  save   chg
```

4. Enter the station number and press [save]. A confirmation tone is heard and the display shows:

```
PSWD  : _
bksp  save   chg
```

5. Dial the password for that station.
6. Press [save].

Conditions

- If the station identified is in Do Not Disturb, Follow Me Call Forward will not be allowed and the message STATION XXX DND will be displayed.

Forced Intercom Call Forward

Description

Tone ringing intercom calls can be immediately forwarded to the attendant by pressing the DND button.

Operation

1. When your telephone is set to Tone Ring and another station is calling you, an Executive Telephone will display:

```
STA xxx CALLING
```

2. Press [FEAT].
3. Dial [4]. An Executive Telephone will display:

```
DO NOT DISTURB
```

Conditions

- If the intercom (ICM) call in progress is with the attendant, Forced Intercom Call Forward will not operate. When DND is enabled, standard DND operation is followed.
- If forced DND is activated, the operation is treated as if the calling party makes a new ICM call to the attendant.
- You cannot activate Forced Intercom Call Forward if Call Forward is already enabled.

No Answer

1. Press [na]. The display will show:

```
NO ANS FWD TO
  bksp  save  chg
```

2. Dial the station number where calls will be forwarded, then press [save].
3. Optional: Press CHG until desired value is displayed.

Programming

Each CO line in the system may be pre-programmed for a specific forward destination. CO Line Preset Call Forward is similar to No Answer forward operation in that a timer (CO P-FWD TIME) is preset for all CO lines marked for this forward. When a CO line rings into the system the timer is started. If the timer expires before the call is answered, the designated preset forward destination begins to ring in addition to other programmed ringing locations. There are three data fields associated to CO Line Preset Call Forward:

- CO P-FWD TIME—One timer referenced by all CO lines set for Preset Forward.
- COxxx DEST—Destination set for the CO line being programmed.
- COxxx VMID—A 6-digit field that can be programmed with a digit string used when the forward destination is a VM type Hunt Group. This digit string can be used to divert the CO caller to the correct voice mail menu prompt. There is a COxxx VMID field for each CO line.

Preset CO Line Forwarding

1. Press [FEAT] + [#] + [✳].
2. Enter password [######].
3. Press [next] twice. The display shows:

```
CO LINE
back  next  show
```

4. Press [show]. The display shows:

```
SHOW LINE  : ___
bksp  show  chg
```

5. Enter CO line number, then press [show]. The display shows:

```
ANSWER POSITION
back  show  chg
```

6. Press [show]. The display shows:

```
CO PRE DEST   :  NULL
back  next  chg
```

7. Press [chg].
8. Enter desired station number, then press [save].
9. Press [clear] when completed.

Default

The *DHS-L* default settings of associated CO Line Preset Call Forward data fields are:

- CO P-FWD TIME = 30
- CO XXX DEST = Empty
- CO XXX VMID = Empty

Programmable Range

CO Line Preset Forward data fields:

- CO P-FWD TIME = 10/20/30/40/50/60 sec
- CO XXX DEST = 201-272, 301-372 Stations, 430-459 Hunt / VM Groups
- CO XXX VMID = 0-9 ✳#P(F4) (six digits maximum)

Caller Identification (ICLID)

Description

Incoming Caller Identification (ICLID) is an optional service offered by the local telephone company. When properly equipped, the *DHS-L* will display this caller ID information. Executive telephones that are assigned to ring for this incoming line will display the caller data while the call is ringing.

The key system operation of this feature is dependent on the feature first being activated from the Telephone Central Office (CO) so that the number/name of the calling party will be delivered over the individual tip and ring of the CO lines during the first silent interval between ringing.

The features implemented are:

1. Calling number or name display on initial ring-in of a line on the display keysets.
2. Incoming call number/name recording on the SMDR printout.
3. Retaining a list of the last 100 Unanswered Calls in a table for user access.

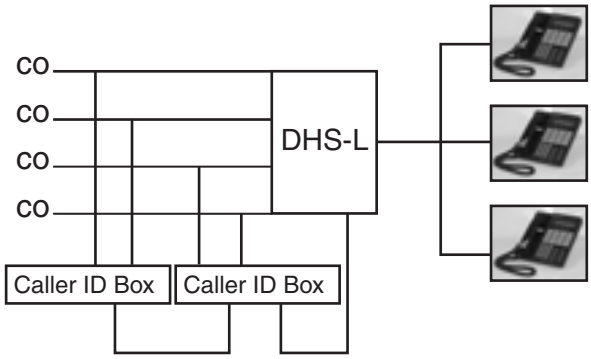


Figure 3-7: System Configuration

Operation

In the following example, the caller name is Vodavi Communications Systems, Inc. Since the telephone company can only provide 15 characters for any caller's name, the likely resulting display would be:

```
LN1
Vodavi Communic
```

The display for the name can vary depending upon the actual data input for the caller's name. When you answer the call, the display changes as follows:

```
CO LINE 2    00:03
Vodavi
```

Most caller names will be available in the data received from the telephone company. However, in the event that only a telephone number is provided, that data will be displayed instead of the caller name.

```
CO LINE 2    00:03
202-123-4567
```

When the name is displayed, the *DHS-L* has received both the caller name and number from the telephone company. In this case, the caller number can be displayed (if desired) by pressing the right soft button, or after answering the call.

The current Caller ID mode is changed with each depression of the right soft button.

No soft button prompt is present in the display since the area above all soft buttons is filled with caller ID data.

Caller ID data is also output to a SMDR device when equipped.

Programming

When Incoming Caller ID is provided by the servicing telephone company, the caller data may be retrieved at the CO line interface and delivered to the *DHS-L* KSU via an external Caller ID device connected to the ICLID/PC Programming RS232 port. This external (optional) device must be configured in the *DHS-L* to associate the line circuit number from the unit to the *DHS-L* line position to be used with the caller ID line. Each *DHS-L* CO line circuit that is to be used with telephone company caller ID must be programmed with an associated ICLID device port number. The default value 0 indicates that no caller ID will be received on this CO line. For caller ID to function effectively, the baud rate must be set to 2400.

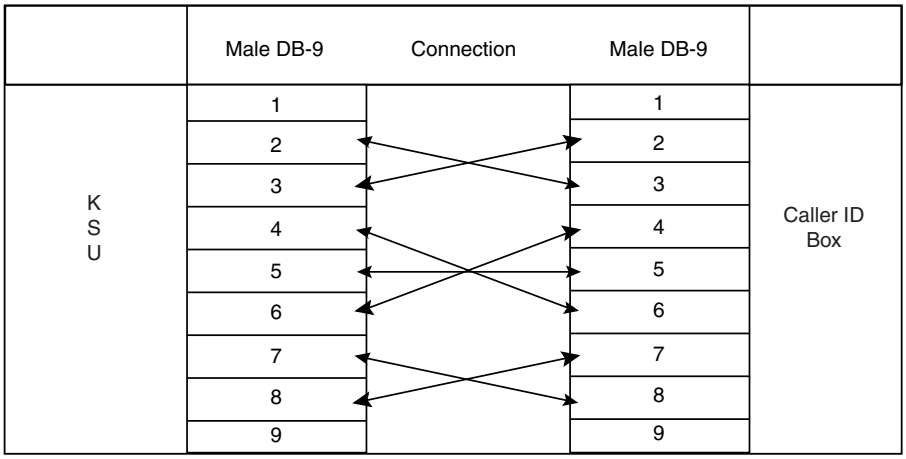


Figure 3-8: Caller ID Connection

ICLID requires Telephone Company service and an ICLID Cable.

T1 requires ANI to be active.

Perform the following steps to program the Caller ID data collection module for the *DHS-L* system. From any executive station:

1. Press [FEAT] + [#] + [0]. The display shows:

```
TENANT
```

2. Press [1] + [save].
3. Dial default password (0000).
4. Press [next]. The display shows:

```
RS232 1 : RMP
```

5. Press [chg]. The display shows:

```
RS232  1  :  ICLID
```

6. Press [clear].
7. Press [FEAT] + [#] + [*] for database programming.
8. Press [show].
9. Press [next] until LINE APP. displays.
10. Press [show].
11. Press [next] until ICLID displays.
12. Press [show]. The display shows:

```
LINE  1  :
```

13. Press [show].
14. Enter desired line number (700-771).
15. Press [show].
16. Enter desired port number for Caller ID box (1-8).

RMTX_RATE -- For Database Programming

The DB-9-pin RS232 port labeled ICLID/PC PROGRAMMING can be connected to a modem or directly to a Personal Computer to use the PC-based Database Programming software. RMTX_RATE is the name for the baud rate setting of this port.

To Change the Baud Rate:

1. Enter Database Programming, [FEAT] + [#] + [*] + [Password].
2. Press [show].
3. Press [next] until you reach Resource.
4. Press [next] until you reach RMTX_RATE.
5. Change baud rate to 1200.

Default

The *DHS-L* CO Lines (700-771) are set for [0] not associated with an ICLID Port number.

The *DHS-L* RMTX_RATE is 1200 baud, and the range is programmable from 110/300/600/1200/2400/4800/9600/19200.

After changing baud rate, the power must be reset on the ICLID box.

Name/Number Caller ID

Description

The calling party numbers should be displayed if available on incoming caller ID calls.

Operation

1. Incoming call originally appears as shown):

Vodavi Communic

202-123-4567

Calling Number/Name Display

Essentially, whenever an incoming call is received at the system, the name and number received along with the ringing signal will be stored in the line control tables and used at various points in the processing of the call.

The primary function implies that the calling name/number will be displayed (if available) at any point where the LINE RINGING is displayed in the system.

If two lines are ringing in at the same time, the display will show the oldest line information.

The specification for this feature is that the system will display its LINE RINGING message as normally implemented and alter that display to the calling number/name if the information is made present on the line. This will allow the normal operation of the system when ICLID information is not presented or the device which intercepts it and provides the information to the KSU is missing or failed.

```
00000001111111
1234567890123456
```

```
NNNNNNNNNNNNNN
```

-or-

```
XXXXXXXXXXXXXX
```

If the *calling name* is available, the display will be shown as above where "X" represents the internal table storage of the calling name. Note that the CO delivery of the calling name is 15-characters. If the CO delivers a name, it will be positioned left justified in the 15-character field on the display. If no name is available, the delivered number will be left justified in the display, as shown for the "N"s.

For example, Executive Key Telephones will display the number or name (if programmed) of the internal station that is calling. In addition, transfer recalling lines and forwarded calls will display the original destination station's identity:

- At an Executive Key Telephone, place an intercom call to station xxx. As ringback tone is heard, the following display is seen:

```
CALLING STA       xxx
```

- At the Executive Key Telephone receiving this intercom call, the following message is displayed (internal ring, the calling party's number "nn" is displayed):

```
STA xxx CALLING
```

- Or when a station User Name is programmed for the calling/called station that name will appear in the display as follows:

```
TOM CALLING
```

Calling Number (SMDR)

As with feature implementation, the intent is that the system operate normally in the absence of ICLID information or the failure of the ICLID equipment. If the information is present at the time that an SMDR record is generated for a call, it will alter the content and format of the SMDR output record.

If the calling number is available, the number will be output in the SMDR record in the same location as the dialed number is located in the outgoing calls.

Unanswered calls will be recorded on the SMDR as a system option to allow the identification of callers for statistical and call-back purposes. These calls will be identified with an (NA) indicator in Station Number space of the SMDR the SMDR record.

When Incoming Caller ID is provided by the servicing telephone company, the caller data may be retrieved at the CO line interface and delivered to the *DHS-L* KSU via an external ancillary device connected to the ICLID/PC Programming RS-232 port. This external (optional) device must be configured in the *DHS-L* to associate the line circuit number from the unit to the *DHS-L* line position to be used with the caller ID line.

For instance -- if the telephone company CO line with caller ID feature enabled is connected to the *DHS-L* on CO line position 1 and connected to the ICLID device - position 4; CO line 1 of the *DHS-L* must be programmed for ICLID Port 04. Each *DHS-L* CO line circuit that is to be used with telephone company caller ID must be programmed with an associated ICLID device port number.

The default value 0 indicates that no caller ID will be received on this CO line.

CO calls must be in progress for a minimum of 10 sec for an SMDR record to be generated for that call.

Default

The *DHS-L* CO Lines (1-96) are set for (0)—not associated with an ICLID Port number.

Wait_ICLID time in Call Handling must also be enabled to allow the DHS-L systems to collect the caller ID data before ringing any system telephones. In addition, ICLID requires Telephone Company service and the following additional hardware.

Default = 4 sec.

Call Park

Description

This feature allows you to have calls parked at your telephone that can be retrieved from any telephone in the system. Calls are parked and retrieved by dialing the Call Park code followed by the pre-assigned station number.

Operation

During a call on Line 1:

1. Dial [FEAT] + [7] + [3]. At an Executive Telephone, the display will show:

```
CALL PARK ___
```

2. Dial the station number. For example, if station 201 is dialed, the display at an Executive Telephone will show:

```
CALL PARK TO 201
```

3. If a call is currently parked at station 201, the display will show:

```
PARK 201 IS BUSY
```

Conditions

- Each telephone/station has one personal station number used to park one CO line call.
- From your telephone, you can park a call at any station number, even if a key telephone is not assigned to that park number.
- Calls can be retrieved from any station, regardless of model or button assignments.
- CO Lines that have been parked are on System Hold and may be accessed by any station.

Answer

Operation

You may retrieve a parked call by using one of the 3 following methods:

1. Dial [FEAT] + [7] + [3] followed by the associated station number (201-272, 301-372),

   -or-

2. Press the flashing CO line button (if CO line for the parked call appears on the phone).

To retrieve a parked call (Executive Telephones ONLY):

1. Press [FEAT].
2. Dial [7] + [3]. At an Executive Telephone, the display will show:

```
CALL PICKUP ____
```

3. Dial the station number where the call is parked.

Conditions

- Any station can retrieve a parked CO line, even if the station is normally not allowed to access or receive a call on that line.
- A user invokes Call Park Answer and has no CO line button for the line retrieved from call park may use Hold Call Answer to place call on hold and retrieve call from hold.

Remind

Similar to Remind Time, Park Remind will alert stations of CO lines parked at their location once each time the Park Remind time expires.

Default

The *DHS-L* Park Remind is set for 30 sec, and is variable at 30/60/90/120/150/180 sec.

The Call Park feature code may be programmed on any programmable feature button.

Call Pickup

Description

You may answer calls ringing at another station using the Direct Call Pick Up or Group Call Pick Up feature. Direct Call Pick Up allows you to retrieve calls ringing at any other station by dialing a code and the station number of the ringing station. Group Call Pick Up allows you to retrieve calls within the same station group. If multiple calls are ringing at a station, a priority list determines which call will be answered first.

Table 3-14: Call Pickup Priority List

CO LINE CALLS	ICM CALLS
1. Camped-On	1. Incoming
2. Recalling	2. Voice Call
3. Transferred	
4. Incoming	

If several calls of the same priority are ringing at the station, the calls are answered in the order they are received.

Direct

1. Enter station number.
2. Dial [6]. At an Executive Telephone, the display will show:

```
DIRECT PICKUP
```

3. Dial the station number to pick up the call.

Group

1. Enter station number.
2. Dial [460-483].

The Call Pickup feature code may be programmed on any programmable feature button.

Camp On

Busy CO Line

Description

This feature allows you to Camp On a busy CO line and reserve that CO line for use when it becomes available. This feature eliminates the need for you to continually observe the line status for availability. You may only have one Camp On active at any time.

Operation

ENHANCED TELEPHONES –

1. Press the busy line button. You will hear busy tone.
2. Dial [4]. You will hear error tone if the line is already camped-on. You will hear ringing when the line becomes available and the lamp for the line will flash.

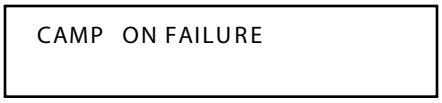
EXECUTIVE TELEPHONES –

1. Press the busy line button. The display shows:

```
CO LINE    x      BUSY
  camp
```

2. Press [camp]. The display shows:

3. If the line is already camped-on, the display shows:



4. You will hear ringing when the line becomes available and the display will show:

To cancel:

Hang up handset.

Conditions

- CO lines can be camped-on by one station at a time.
- Stations can Camp On one busy CO line at a time.
- The Camp On Alerting Ring Time is 30 seconds. If the camp on goes unanswered during the 30 second ring time, the camp on is canceled.
- CO lines that have been camped will recall the Camp On initiator. The camped CO line will become available to other stations if the camped station fails to answer within 30 seconds.
- Camp On at a station using a Pooled Group button for access of CO lines, is the same as that of a station with CO line button appearances, except that, to answer a Camp On, the user must lift the handset to be connected to the camped CO line.
- During the time that the Camp On is recalling the initiator, a new incoming call will take precedence over Camp On and will be answered when the station goes off-hook.
- If Camp On invoked, CO or station must remain off-hook.

Busy Station

Description

Camp On is used to privately alert a busy station for immediate consultation. Camp On alert tone is heard at the busy station every 30 seconds as a reminder. The party currently speaking with the busy station does not hear the tone.

Operation

ENHANCED TELEPHONES –

While listening to the busy tone after calling a station, dial [#].

EXECUTIVE TELEPHONES –

1. While listening to the busy tone after calling a station, the display will show:

```
STA        xxx BUSY
 cbck   msg  next
```

2. Press [next]. The display will show:

```
STA        xxx  BUSY
 camp  voice
```

3. Press [camp]. The display will show:

```
CAMP ON TO xxx
```

   You will hear a confirmation tone, followed by, Music-On-Hold (if equipped) until your Camp On is answered. When the camped-on station places the current call on hold, or hangs up, the Camp On will ring at the station.

4. If the camped-on station has already received a Camp On from a different station, your Camp On will be denied; you will hear an error tone and the display will show:

```
CAMP ON FAILURE
```

Conditions

- Each station can have only one Camp On at a time.

Class of Service (COS)

Day/Night

Description

The system provides eight COSs for assignment of outside line dialing privileges. Each system station may be assigned one Day COS and one Night COS. The station COS is primarily used for restriction and control of long distance dialing. Toll restriction tables allow customized dialing privileges to be assigned to any or all COSs. This COS is directly referenced in the Restriction, CO Line Call Discrimination, Digit Interval Table programming.

System Speed Dial is specially linked with COS such that all speed dial bins override toll restriction programming in the toll restriction tables. It should be noted that stations assigned COS (0-7) have access to all System Speed Dial Bins (600-699).

Stations assigned COS 6 can only access System Speed Dial Bins (20-39). Stations assigned COS 7 have no access to System Speed Dial. COS affects the station override of DND where a station with a lower level COS can be overridden by a station with a higher level of COS. For instance, an extension with COS 0 may override a station with COS 1. COS also affects the operation of Intrusion Release. Stations with equal or greater levels of COS may join a busy CO line conversation when Intrusion Release is enabled. For example, a station assigned COS 1 may join a CO line conversation with a station assigned COS 1 or lower.

The highest level COS is 0 (the most dialing privilege) and the lowest COS level (least dialing privilege) is 7.

Operation

Station COS is assigned in system programming and is not a feature that requires specific operating instructions. A station's COS will determine what digit sequences may be dialed on CO lines. Refer to *"Call Discrimination"*.

Day Class of Service (COS)

Each station may be assigned one Class Of Service (COS) for the Day system mode of operation. This COS is directly referenced in the Restriction, CO Line Call Discrimination, Digit Interval Table programming. COS also dictates which stations will be given the privilege of Overriding DND and joining an existing CO line conversation via the Intrusion Release feature. COS 0 is considered the highest level where COS 7 is the lowest. COS also dictates the stations ability to use System Speed Dial.

Default

DHS-L station Day Class of Service is set to [0], and the range is 0-7.

Related Programming

Refer to *"Intrusion (Privacy)"*, *"Call Discrimination"*, and *"Speed Dialing (ABBR)"*.

Night Class of Service (COS)

Night COS specifically allows the programmer to assign a different mode of operation to any station for System Night Mode operation.

Default

DHS-L Station Night Class of Service is set to [0], and the range is from 0-7.

Related Programming

Refer to *"Intrusion (Privacy)"*, *"Call Discrimination"*, and *"Speed Dialing (ABBR)"*.

CO Line

Assignment

Description

CO Line Assignment allows complete flexibility of CO line access privileges. Each station in the system may be programmed to be allowed or denied access of any of the CO lines.

Programming

A CO Line Type is selected to identify specific CO lines. CO Type designates a typical CO line connection. PBX Type designates a CO line position that is connected to a PBX line (an extension off of another telephone system).

This designation will cause system software to search the PBX code entry of digits dialed on a line marked PBX so that toll restriction may be applied following the PBX code. In addition, Last Number Redial, Auto Busy Redial and the Saved Dialed Number features will reference the programmed PBX code to insert a Pause between the PBX code and the remaining dialed digits.

Copy -- CO Line Copy is provided to assist in programming multiple CO lines with the same data. Follow the displayed instructions to copy one CO line data field to another.

Parameters -- Allows the programming of various CO Line Attributes so that the system may be customized to meet the clients needs.

Dialing Type Selection -- Dialing type is a selection of either Tone (DTMF) dialing or Pulse (Rotary) dialing.

Default

- *DHS-L* CO Line Type Assignment is set for CO, and can be changed to: PBX/EMPTY/PAGE/CO.
- All stations have access to CO Lines Y (YES).
- The *DHS-L* CO range is from 700-795 (Y/N).

- The Dialing Type is set for Tone (DTMF) Dialing, and can be toggled from Tone/Pulse.

Connecting Two Systems Using T-1

Description

When tying two systems together with a T1 line, an outside T1 cannot be used. Only one T1 card can be installed into a *DHS-L* phone system.

When changes are made to T1 settings, the system must be reset in order for the new changes to take affect.

- A straight-through T1 cable is needed.
- Both systems must have the same T1 settings.

Programming

T-1 Settings

After entering Database Programming:

1. Go to **Line Applications**, then **T1 Card Category 1** in DOS/DBA.
2. Enter the following settings:
   - Framing Type = ESF
   - Zero Code Suppression Code = B8ZS
   - DID Signal = DTMF
   - DID Length = 3
   - Return Dial Tone to Y
   - Set Channel Types to Wink Start E&M with no ANI on all lines.

Tenant Group

Description

The system provides 24 CO Line Groups for assignment of specific CO lines. The CO Line Group assignment is used for CO Line Pool access. The CO Line Groups are designated by 2-digit notation when programmed on station programmable feature buttons. CO Line Group 1 is programmed by dialing [01], CO Line Group 2 is programmed by dialing [02], etc. An All CO Line Group code is available for programmable feature button assignment by dialing [00] for that feature button. At default, all CO Lines are assigned to Group 1.

Programming

There are 24 CO line group assignments that may be assigned to CO lines. Grouping is usually done to segment CO lines into tenant group. CO line grouping allows system users to dial access to a particular tenant by group access codes.

When CO line groups are accessed the higher number idle CO line is selected as the first choice. For example, if CO lines (4-6) are in the group dialed for access the group is searched for an idle CO line from CO line 6, then CO line 5, etc.

Default

The *DHS-L* CO Line Group Assignment is Group 1, the available Group range is from 1-24.

Receive Assignment

Description

Receive Assignment allows flexibility of CO line incoming signaling. Stations in the system may be programmed to follow CO line ringing condition of any of the CO lines. This is not a ring assignment; rather a means of restricting certain stations from accessing CO lines that are ringing. When set to Y the station CO line button (if programmed on the telephone) will flash incoming ring flash while calls come into the system on that CO line.

Default

All *DHS-L* stations have access to incoming ringing CO Lines (Y), and the CO range is from 700-795.

Automatic Selection

Description

This feature allows you to access a specific outside line or intercom (ICM) automatically when you lift the handset or press [SPKR].

A line will not be accessed automatically when your telephone is receiving an incoming call (outside or intercom) or a line is recalling at your telephone. However, you may override this incoming call priority operation by pre-selecting an outgoing line before lifting the handset.

Operation

ENHANCED TELEPHONES –

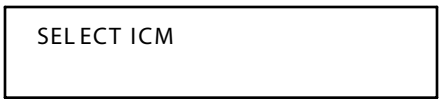
1. Press [FEAT].
2. Dial [9] + [5] + [0 or 1] + (Route number) + [9].
3. Dial the following codes to select the item you want the telephone to access automatically: [0] - intercom, [1] - specific CO line number or route number from Route Table.
4. Dial desired CO number (700-795).

EXECUTIVE TELEPHONES –

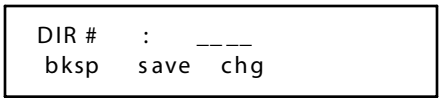
1. Press [FEAT].
2. Dial [9] + [5]. The display shows:

```
SELECT   :   ICM
 ICM   line   route
```

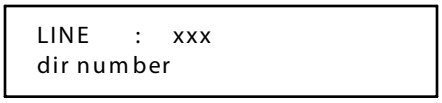
3. Select [ICM], the display shows:



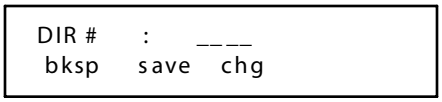
4. Select [line], the display shows:



5. Press [save], the display shows:



6. Select [route], the display shows:



To Cancel Automatic Selection:

EXECUTIVE TELEPHONES –

1. Press [FEAT].
2. Dial [✳] + [9] + [5].

ENHANCED TELEPHONES –

1. Press [FEAT].
2. Dial [✳] + [9] + [5].

Conditions

- A Line Programmed for Automatic Line Selection must be programmed as available for access in system programming.
- When Automatic Line Selection is set to EMPTY, you will not hear a dial tone when you lift the handset or press [SPKR]. However, you may still dial intercom numbers.

Call Discrimination

Description

The system provides 100 digit interval tables to apply call restrictions. Each table is comprised of four data fields: From, To, DAY ALLOWED and NIGHT ALLOWED. The From and To data fields allow the programmer to enter a range of allowed digits up to 10 digits each in length. This flexibility allows the programmer to enter only the digits significant to the dialing restriction desired.

Consider the default entry in Table bin 001 where the From entry is 0 and the To entry is # (refer to *Table 3-15*). In this case, (default) stations assigned a COS corresponding to the table (default) can dial any telephone number so long as the first dialed digit is a 0-#. A specific number may be allowed for any COS by using a table entry with a constricted range.

Consider a table programmed as: From 1800 To 1800. This table entry allows the user assigned the associated COS to dial only numbers beginning with 1800.

Table 3-15: Restriction Data (Example)

CO Call Discrimination Interval (default shown)	FROM (10 digits max)	TO (10 digits max)	Day Allowed (COS)								Night Allowed (COS)							
			0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
001	0	#	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
002																		
003																		
004																		
005																		

Default

The *DHS-L* default settings of associated CO Line Call Discrimination Digit Interval data fields are:

- TABLE BIN: 001 (0-#)
- COS 0 = Y
- COS 1-7 = N

Programmable Range

- Table Bins: = Range 001-100
- Digits (allowable) = 0000000000-9999999999,#########,SSSSSSSSS
- DAY/NIGHT COS = Range 0-7 (Y/N)

Signaling

Description

Incoming CO line calls are indicated by a flashing red LED and distinctive tone from the key telephone speaker. Depending on the programmed database, a station may see incoming call flash indication without an audible indication, and still answer the call. If the station is not assigned CO Line Receive in the database for a specific CO line, incoming calls on that CO line will not flash at the station but instead will display a CO line busy indication.

Operation

Incoming calls signaling on CO line 1 and CO Line 2 display as follows:

```
LINE   INCOMING
 --> 1/1
```

Conditions

- Only those stations with corresponding CO line ring and receive assignments display current incoming CO line call status. CO line receive must be enabled for the station.
- When the remote party abandons the incoming call before it is answered, the incoming call signaling of the affected CO line will be removed after (1.6 to 6.4 sec.), depending on the connected CO.
- Only the attendant is allowed to receive external CO line ring and can answer all incoming CO line calls.

Type Assignment

Description

Each CO line can be assigned as PBX, CO, EMPTY, or PAGE. The Empty Assignment is reserved for CO lines equipped on the system, but not connected to telephone company network facilities.

Empty Type (open designation) alerts the system that this CO line should not be used to place outgoing calls when system features are invoked which initiate automatic CO line selection.

PBX CO Line Type invokes other system automatic operations for handling PBX Station-to-Station calls and PBX trunk calls, separately. When a programmed PBX trunk access code is dialed, the system is alerted that the user is accessing a telephone company facility to make a network call. When this occurs, the system monitors digits dialed after the PBX access code and compares them against the Allowed Digit Interval Table in the COS for that station. The programmed PBX Trunk access code also notifies the system that a pause should be inserted when redialing telephone numbers dialed on that CO line beginning with the PBX access code. This operation applies for Speed Dial, Last Number Redial, Save Dialed Number, User Save Number Redial, and Automatic Busy Redial.

Page Type is designated so a CO Line can be used as a paging port. Doing so takes a CO line out of Hunt, so it will not be accessed by pressing 9.

CO Line Type Assignment indicates that the CO line is a direct telephone company facility access CO line. Toll Restriction monitoring is commenced from the first digit dialed and no other special call handling characteristics are implemented on CO lines of this type. At default, CO line type is set to CO for all CO lines.

CO-Use Indication

Description

When you are using a CO line, the associated lamp will light green and flash at a double-wink rate at your telephone. This lamp will light steady red at other telephones.

Conference

Supervised

Description

The system can accommodate 8 four-member (party) conferences simultaneously. Conference combinations may consist of two CO lines maximum and any number of stations to a maximum of four members. One inside key telephone station is the controller of the conference and constitutes one conference member.

Before a conference can be established with a maximum of four members, a three-member conference must first be established.

To establish a conference while on a line:

1. Press [HOLD]. The current call is placed on hold and intercom dial tone is heard.
2. Press another line button.
3. Dial the second party. (Repeat Steps 1-3 to add a third party).
4. To join the parties in a conference, Press [FEAT].
5. Dial [6] + [0]. The display shows:

```
CONFERENCE
```

6. You will hear a confirmation tone and momentarily the display will change to:

```
LNx ss
private          forced
```

To add a fourth party:

1. Press [HOLD].
2. Dial the fourth party.
3. Press [FEAT].
4. Dial [6] + [0].

The conference initiator may force-release a conference member or talk privately with a conference member.

ENHANCED TELEPHONES –

To force-release:

1. Press [FEAT].
2. Dial [7] + [4].
3. Dial the station number or press the line button to release.

To talk privately (connects second party, places third party on hold):

1. Press [FEAT].
2. Dial [5] + [7].
3. Dial the station number or press the line button to talk privately.

EXECUTIVE TELEPHONES –

To force release or talk privately:

1. Press [private] or [forced].
2. Dial the station number or press the line button to release or talk privately.

Any conference feature code may be programmed on any available programmable feature button.

Conditions

- The station who establishes a conference is called the controlling party, and only the controlling party is allowed to invite or forcibly release any attending internal or external party, or to setup a private talk with any one attending party.
- When adding new parties to a conference and while speaking privately to a particular conference member, other members of the conference will be connected to Music-On-Hold.
- Conference can only be established at a key telephone.
- Each of the calls involved in a holding conference will be placed on Exclusive Hold.

Unsupervised

Description

This feature allows you (as the conference controller) to exit a conference, yet enable two outside lines also engaged in the conference to continue their conversation. This conference is called Unsupervised, since no internal user is involved as a member of the conference. To establish an Unsupervised conference, you must first build a Supervised conference.

Operation

1. Two CO lines are conferenced (F+[6]+[0]) at your station:

```
LNx  LNx
private      forced
```

2. Press [FEAT].
3. Dial [7] + [7]. At an Executive Telephone, the following display will be seen momentarily.

```
UNSUPERVISED    CNF
```

4. If no further action is taken, the display returns to idle status. At this time, the two lines are conferenced.

To rejoin the unsupervised conference:

1. At your station, press [FEAT].
2. Dial [6] + [0].

Programming

Station users may leave two CO line connected parties in conference unsupervised. That is, the station user does not have to remain connected to the CO lines to maintain the conference connection. This setting allows or disallows this function.

Default

The *DHS-L* Unsupervised Conference is allowed Y, and the programmable value can be toggled either Y or N.

Single Line Telephones (SLT) cannot conference.

Conference Time

Description

CO lines that are left unattended in conference (Unsupervised Conference) will be allowed to remain in this status for the duration of the Unsupervised Conference Time. Users that are familiar with the conference operation can extend this time during operation by dialing [0] + [✳], or [0] + [#] to disconnect.

Default

The *DHS-L* Unsupervised Conference Time is set for 1 minute, and is variable from 1/2/3/4/10/15 minutes.

Conditions

- New conference parties may only be added when the conference controller is a member of the conference.
- If an outside line hangs up, the line will be released.

Day/Night Service

Description

The system can be programmed for Night Service operation which affects incoming CO line ringing and receive assignments. The Attendant of a Tenant Group may manually switch the system service from Day to Night mode, or vice-versa using the Night Service code. During Night Service mode, station and DISA Class Of Service (COS) outside dialing privileges are changed in accordance with the Toll Restriction Night COS programming.

Operation

An Attendant when in idle mode, can activate Night Service from an attendant telephone as follows:

1. Press [FEAT] + [#] + [3] to program a DSS console button.
2. Press the soft button you wish to program for night service.
3. Press [chg].
4. Press [FEAT]. The display shows:

```
SELECT FUNCTION
  dir  feat
```

5. Press [FEAT] + [6] + [3].
6. Then press [save].

Conditions

- Each time the Night Service code is entered, the system mode of operation changes to the opposite mode.
- When the system is in the Night Service mode, all Executive Key Telephones will display night.
- For Attendant Only -- Feature must be programmed on an feature key.

Dial Pulse to DTMF Conversion

Description

When a CO line is set to pulse (rotary) dialing, the digits following [✳] will be sent in DTMF tone mode. Pulse-to-tone change-over can be programmed into any Speed Dial bin.

Direct Inward System Access (DISA)

Description

This feature allows you to remotely access system features such as System Speed Dial, Line Access for long distance calling, CO Line-to-CO Line Conferencing, and Intercom dialing. Any number of DISA lines may be assigned incoming DISA access based on the system service mode (Day, Night or Always). Talk time can be manually extended by the outside DISA party. Since the passwords are relatively short, caution should be exercised when permitting unauthorized use of the DISA facilities.

Operation

CO line 1 is programmed for DISA operation. When a call is made to CO line 1, that call is automatically answered and a DISA dial tone is heard.

When a DISA dial tone is heard:

1. Dial [#].
2. Dial the desired station number + your password.
3. Dial [#]. Once your password is verified, a second dial tone is presented.
4. Dial a CO line access code (700-795) or a valid station number.

Conditions

- Two DISA CO lines may be used simultaneously. If more than two DISA CO lines are signaling for answer, the subsequent calls will receive an internal busy tone.
- DISA CO line (COS) assignment coincides with Toll Restriction COS Tables.
- Activation time for a DISA CO line is programmable for Never, Day, Night or Always.
- If you dial a station number which is non-existent, your call will be directly transferred to the attendant.
- The CO Line-to-CO line conference time is programmable for 1, 2, 3, 5, 10, and 15 minutes (default is one minute). The CO line-to-CO line conference time may be set to automatically drop the connected outside parties upon expiration of a pre-programmed time.

Distinctive Ringing

Description

You may choose from four distinctive ringing tones to signal incoming calls. This allows you to easily distinguish your calls from calls ringing at other stations near you.

Operation

ENHANCED TELEPHONES –

1. Press [FEAT].
2. Dial [#] + [7].
3. Dial a ringing tone code (1-4).

EXECUTIVE TELEPHONES –

1. Press [FEAT].
2. Dial [#] + [7]. You will hear the current ringing tone. The display will show:

```
RING TYPE : 1
            chg
```

3. Press [chg]. You will hear the new ringing tone. The display will show:

```
RING TYPE : 2
            chg
```

The Distinctive Ringing feature code may be programmed on a programmable feature button.

Programming

You may choose from four distinctive ringing tones to signal incoming calls. This allows you to easily distinguish your calls from calls ringing at other stations near you.

Default

Defaults to the first of four distinctive ringing tones.

Distinctive Tones can be used to identify a particular CO line while ringing. There are five distinctive tones that can be programmed. The default setting 0 indicates that there is no distinct tone programmed. CO distinctive tone settings override station distinctive ringing.

The *DHS-L* has no Distinctive Tone programmed, and the Distinctive Tone setting is programmable from 1/2/3/4.

Do Not Disturb (DND)

Description

DND allows you to temporarily block and discontinue ringing from incoming CO calls and intercom calls. You can activate DND while your telephone is idle or busy. Some stations with a higher COS may override a station's DND condition.

When you have activated DND, you will hear a special intercom (stutter) reminder tone when you lift the handset or use the speakerphone. If you have assigned a button on your telephone specifically for DND, the button lights whenever you activate the feature.

Operation

1. Press [FEAT].
2. Dial [4]. You will hear a confirmation tone on an Executive Telephone displays:

```
DO NOT DISTURB
```

3. Repeat Steps 1 and 2 above to cancel DND. You will hear a confirmation tone on an Executive Telephone. The display the will show the following prior to returning to the idle display message:

```
DND DELETE
```

The DND feature code may be programmed on a programmable feature button.

DND Override (Attendant Only)

Dial [ext] and press [3].

Conditions

- At any time while your telephone is idle, you may immediately divert an incoming tone ringing intercom call to the attendant by using the DND feature.
- Your DSS/BLF button on other key telephones will flash when you activate DND.
- May cause analog VM integration situations, such as recalling at main attendant instead of the intended voice mailbox.

DSS Console

Description

Four DSS consoles may be assigned to a station. Each DSS Console uses one digital station port. Up to 12 DSS consoles may be installed on a system. The DSS console buttons are programmed by the station user using the FEAT + # + 4 command, then pressing the button on the DSS to be programmed. All system feature codes may be stored on the Programmable Feature Buttons for one-button operation. Certain programmed feature buttons will light when activated (DND, Call Forward, DSS/BLF, etc.), while others such as Call Pick-Up, Background Music, Last Number Redial, do not. Features are separated into three distinct categories for programming on a button: CO Line, Station, or Feature.

Programming

To access the remote programming:

1. Press [FEAT] + [#] + [✳] + password (########), then press [show].
2. Press [next] until reaching Resource, then press [show].
3. Press [next] until reaching DSS Allocation, then press [show].
4. Press [show], then enter the DSS Unit number.
5. Press [show], then press [chg].
6. Enter the station number where you want the DSS to be assigned, then press [save].
7. Press [next], this will bring you to the DIR Number, then press [chg].
8. Enter the station number of where the DSS is attached, then press [save].
9. Press [hold], then press [clear] to exit remote programming.

Operation

EXECUTIVE TELEPHONES –

To program DSS console buttons:

1. Press [FEAT].
2. Dial [#] + [4].
3. Press programmable feature button.
4. Press [chg].
5. Dial the desired directory number (201-272, 301-372, 700-795).
6. Press [save].

To erase the contents of a programmable feature button:

1. Press [FEAT].
2. Dial [#] + [4].
3. Press programmable feature button.
4. Dial [0].
5. Press [HOLD].

End-to-End Signaling

Description

This feature allows digital key telephone stations to generate in-band DTMF tones on ICM calls to an on-site voice mail system. DTMF digits will only be sent to the SLT port when connected to a 2-Port Analog Adapter/Expansion that is programmed as a VM PORT.

Feature Button

Copy

Feature Button Copy is provided to assist in programming multiple stations with the same button programming. Once a station's feature buttons are programmed using the station feature Programmable Feature Buttons [F#3] that station's button programming may be copied to other system stations in this database programming function. Follow the displayed instructions to copy one station's button data to another. Station Number range is 201-272 and 301-372.

Inquiry

Description

You may review the programming for feature buttons at an idle Executive Telephone. To review the programming, dial the Feature Button Programming mode.

Operation

1. Press [FEAT].
2. Dial [#] + [3]. The display shows:

```
PRESS FEATURE KEY
```

3. Press desired feature button to view its contents (code). In this example, button 20 is pressed.

```
F96__
          show  chg
```

4. Press [show]. The name of the feature is displayed.

```
MESSAGE  WAITING
```

5. The display then returns to the previous screen.

Buttons without feature programming will display BTN UNAVAILABLE.

Programming

Description

The Executive models have 20 dual-colored programmable feature buttons available. All system feature codes may be stored on the programmable feature buttons for one-button operation. Certain programmed feature buttons will light when activated (DND, Call Forward, DSS/BLF, etc.), while others do not, such as Call Pick-Up, Background Music, Last Number Redial. Features are separated into three distinct categories for programming on a button: CO line, station, or feature.

Operation

EXECUTIVE TELEPHONES –

To program a feature button:

1. Press [FEAT].
2. Dial [#] + [3]. The display shows:

```
PRESS FTR BTN
```

3. Press a programmable feature button. The current contents of that button is displayed. For this example, let's use button 20.

```
F96
          show  chg
```

4. Press [show]. The name of the current feature stored is displayed.

```
MESSAGE WAITING
```

5. Press [chg]. The display shows the following:

```
SELECT FUNCTION
dir  feat
```

To program a CO line button:

1. Select [dir].
2. Enter CO line or station number (201-272, 301-372). The display shows:

```
DIR  #
bksp  save  chg
```

3. Press [save].

To program a system feature:

1. Press [FEAT]. The display shows:

```
FTR  CODE:__
  bksp save chg
```

2. Press [FEAT]. F will appear on the display:

```
FTR  CODE: F
  bksp save chg
```

3. Dial the feature code.
4. Press [save].

To erase the contents of a programmable feature button:

Press [save] instead of dialing a code.

If you dial an invalid code, you will hear error tone and an Executive Key Telephone display will show CODE UNAVAILABLE.

Conditions

- In some cases, a user may program a feature button for a specific CO line although access is restricted to that line via system programming. In this situation, the telephone is still governed by system programming and would still be unable to access the CO line if restricted.
- Valid feature codes must be in the form of either [F] + [n] or [F] + [nn] where F is the feature button and n is either a 1-digit or 2-digit code, including asterisk [✳] and pound [#] dialed from the dial pad.
- Any feature button programmed with a code previously assigned to a different feature button will cause the previously programmed feature button to become unassigned.

Flash

Description

When Flash is accessed, the system will generate a timed open loop flash condition on any CO line. Flash should be programmed on a feature button when the system is used behind Centrex or PBX. If Call Waiting service is provided, you can use the Flash feature to answer a second incoming call while connected to another outside party.

Operation

While on a CO line call:

1. Press [FEAT].
2. Dial [3]. An Executive Telephone will display: (CO line loop is opened for the programmed Flash Time).
3. At an Executive Telephone, the display returns to the CO line connected display following the flash time-out or 10 seconds later.

Programming

Flash is typically used on CO lines that are equipped with special features from the telephone company such as Call Waiting. Flash may also be used on CO lines connected to a PBX or to Centrex lines for call transfer on those lines. The Flash time must be set to coincide with the required timing parameter of the connected line to operate correctly. Typically a value from 600 to 800 msec is used for these features. A higher flash time may be set to allow the user to invoke flash to restore dial tone on the connected CO line. This setting is typically 1.5 sec (1500 msec).

Default

The *DHS-L* Flash Time is set for 0.7 sec (700 msec), and is variable from 0.1 sec (100 msec) to 1.5 sec (1500 msec).

Conditions

- The Flash code may be stored in any speed dial bin.
- The Flash code may be stored in the Last Number Redial buffer. When you activate redial, an Executive Telephone display will show a **/** (forward slash) to indicate the Flash code.
- The Flash time is programmable from 100ms to 1500ms in increments of 100ms (1/10th of a second).
- At an Executive Telephone, when the flash code is dialed a **/** (forward slash) will be displayed temporarily and then the display will return to the previous message unless other digits are dialed.

- Single line stations cannot use system generated hook-flash.

Flexible Line Assignment

Description

A station may be assigned outgoing access to any or all of the system CO lines in System Programming. The user may program any CO line to appear under any one of 20 dual-colored feature buttons. However, the line(s) cannot be used for outgoing calls unless granted outgoing privileges by the system administrator. A station programmed with Line Assignment privileges may retrieve held calls.

Flexible Receive Assignment

Description

Stations may be allowed to answer or retrieve from hold, specific CO lines assigned in system programming. Receive assignments should be assigned to any stations that need to answer incoming calls. A station does not have to hear ringing or be programmed with Flexible Ring Assignment in order to answer an incoming CO line. Also, Call Pickup can be used to answer the oldest incoming CO calls. During System Night Service operation, Night Service stations will ring and can answer all incoming CO lines, regardless of the normal Day mode configuration.

Flexible Ring Assignment

Description

A station can be programmed to ring for any, or all incoming CO lines. The Ring Assignment will not establish ringing at any station that does not also have the Receive Assignment enabled for the associated incoming CO line. In this situation, the CO line appearance would provide a visual indication only, without the ability to answer the incoming call by Direct Line Button Access. A designated Night Service station will receive audible ringing and can answer all lines when the system is operating in the Night Service mode.

Forced Tone Ringing

Description

In certain environments where background noise is predominant or where speaker volume has been minimized, a station in Voice Announce mode may not hear your voice when you place an intercom call. This situation may be averted by using the Forced Tone Ringing feature. After connection to a Voice Announce station, you may change the alert signal at the called station from Voice Announce to Tone Ring.

Operation

1. You have just placed an intercom call to a station in Voice Announce mode and cannot get a response. At an Executive Telephone, the display shows:

```
VOICE  STA      xxx
        msg
```

2. Dial [✳] to change the alert signal at the called station from Voice Announce to Tone Ringing. At an Executive Telephone, the display shows:

```
STA   xxx
  cbck  msg
```

3. A Tone Ringing alert signal is sent and continues at the call station until answered.
4. If your call remains unanswered, you may dial [[] again to return to Voice Call Announce mode.

Conditions

- If you want to leave a Call Back request at a called station that doesn't answer, the alert signal must be set for Tone Ringing.

Hold

Automatic

Description

You may enable this feature on your telephone to simplify call handling, avoid accidental lost calls, and assist call transfers. Automatic Hold will occur when you skip from line button to line button or intercom call to outside call and vice-versa.

For instance, if you are currently on a call on Line 1 and press Line 2, the call on Line 1 will be placed on Hold automatically. The need to press [HOLD] is eliminated, except if you want to place a call on Exclusive Hold. This feature is ideal for attendant operation. You can answer an incoming call and then press the desired DSS/BLF button to place the intercom call and put the line on hold in one action.

Operation

To enable/disable:

1. Press [FEAT].
2. Dial [9] + [4].

During a telephone conversation on a line or an intercom call:

Press a different line button. The first call is automatically placed on Exclusive Hold.

The Automatic Hold feature places a call on Exclusive Hold.

Conditions

- If you access an idle line and skip to another line before dialing, the first line will not be automatically placed on Hold.
- If you have the Automatic Hold feature programmed on a feature button, the feature button lamp will light when the feature is enabled.
- You can only see members of another Tenant group when a call is transferred to you by that Tenant group.

Call Abandon (Loop Supervision)

Description

Each CO line has a programming option that directs the system to monitor distant party disconnect or False Hold conditions. This is a useful network feature in busy office environments where the inside party accidentally presses the [HOLD], [ICM] or [DSS] button while expecting the outside line conversation to be concluded. Anytime the system detects a disconnect signal from the Central Office, an existing Hold condition will be released, freeing that line for future inbound traffic.

Operation

1. While connected to any CO line:

```
CO LINE 1   xx:xx
```

2. Press [HOLD].

Conditions

- The CO line must have loop supervision interrupt signal from the local carrier upon disconnect by the outside party. All types of Hold like System Hold, Exclusive Hold and Conference Hold are related to the Hold Call Abandon feature.
- Certain Central Offices do not provide loop supervision.
- If the outside held party disconnects, the system will automatically release the held CO line.

At default, Call Abandon is enabled for all CO lines.

If using CO lines for paging or external devices, assign devices to lowest available line.

Call Answer/Select

Description

Call Answer allows a user to place and retrieve calls ON and OFF of hold by simply pressing the HOLD button. When multiple calls are holding at the station, Call Answer will access the CO line that has been holding for the longest period of time while placing the current call on hold. Call Answer works for all CO lines regardless of the station CO line button programming.

Operation

Press [HOLD]. A currently connected call will be placed on hold. If there was a previously held call, this call is now connected.

Conditions

- Call Answer will also operate for intercom calls placed on hold.
- If the person on Hold hangs up, the system will automatically release the held CO line.
- Line appearance is not required for station to put call on hold.

Exclusive

Description

When using the [FEAT] button and the [HOLD] button together, you may place an outside call on private hold. The held line will appear in use at other stations.

Operation

1. Press [FEAT].
2. Press [HOLD].

Programming

Calls placed on Exclusive Hold will remain on Exclusive Hold for the duration of this timer. When the timer expires the holding line will change from Exclusive Hold flash to Recall Flash and alert the station user with one tone ring over the telephone speaker. When the timer expires a second time and the CO line remains on hold the station will receive a second alert tone and the CO line holding condition will change to System Hold so that any station may access the holding line.

Default

The *DHS-L* Exclusive Hold Time is set to four minutes, and is variable from 0-8 minutes (where 0 is infinite).

Conditions

- The Exclusive Hold Timer must be set before programming Exclusive Hold feature.
- When you place a CO line call on Exclusive Hold, the green lamp for that line at your telephone will flash fast and the red lamp will light steady at other stations.
- A CO line call will be placed on System Hold after the Exclusive Hold time expires. You will hear a tone alerting you that the timer has expired and your call is now on System Hold. The green lamp at your telephone will flash slowly and the red lamp at other stations will begin to flash slowly.
- Exclusive Hold is used only for CO line calls.
- The Exclusive Hold duration is programmable from 1-8 minutes in system programming.

Reminder Time

Description

The system provides a programmable timer to remind you that a call has been left on System or Exclusive Hold. When enabled, you will hear one ring tone repeated each time the selected time expires.

The Hold Reminder time is system programmable and can be set for: 0 (disabled), 10, 30, 60, or 90 seconds.

Programming

The Remind Time can be programmed to alert stations of calls that have been placed on System Hold at their station. The station that placed a call on System Hold will hear a reminder tone over the key telephone speaker once each time the Remind Time expires until the CO Line is answered, or the call is disconnected.

Default

The *DHS-L* Remind Time is set for 30 sec, and is variable from 0/10/30/60/90 sec.

Conditions

- Hold Reminder applies to both intercom and CO line calls.
- Hold Reminder applies to CO line calls that are on System Hold, Exclusive Hold or Screened Transfer Hold.

System

Description

You may place any CO line on System Hold by one button operation of [HOLD]. When you place a line on System Hold, the green lamp for that line will flash at the I-Hold rate. This System Hold line will flash the red lamp at all other stations.

Operation

While on a line, the green lamp for that line is I-Use flashing (double wink rate):

Press [HOLD]. The green lamp now flashes at a slow rate and the call is placed on System Hold.

Any party who is placed on Hold will hear music, only if available through the external music source connection.

Conditions

- Pressing [HOLD] will place a conference on Exclusive Hold if you are the controlling party and you temporarily exit to add another party.
- When an intercom call (conference) is placed on Hold, the steady lamp indication of the other station(s) will not change.
- I-Hold Indication allows you to distinguish between a call you placed on hold at your telephone and calls placed on hold at other telephones. When you place a call on System Hold, the associated line lamp will flash at the System Hold rate but will light green. The same held CO line at other stations will flash at the System Hold rate but will light red.

Hot Dial Pad

Description

When the Hot Dial Pad feature is enabled, the telephone keypad can be operated while the telephone receiver is on-hook. When this feature is not enabled, the telephone keypad can only be operated when the telephone receiver is off-hook.

Operation

To allow or deny (toggle) operation of the Hot Dial Pad:

Press [FEAT] + [#] + [6].

Hot Line (Ring Down)

Description

This feature allows you to use the associated enhanced, executive or single line telephone (SLT) port for automatic signaling to a predetermined destination. When the feature is enabled, the destination is signaled whenever that telephone goes off-hook. You may hook-flash at the telephone where the feature is enabled so that you can request intercom dial tone to perform other functions and change or disable the feature when no delay time is programmed. You can set up the Hot Line feature to call another Telephone, Hunt/Voice Mail Group, Paging Zone, CO line or CO line Group.

Programming

ENHANCED TELEPHONES –

1. Press [FEAT] + [9] + [✳]. The display shows:
2. Enter desired destination.
3. Dial the delay time (0-9) seconds.
   (0= immediate, 1-9 = delay in seconds)

EXECUTIVE TELEPHONES –

1. Press [FEAT] + [9] + [✳]. The display shows:

```
HOTLINE TO  :  NULL
               chg
```

2. Press [chg].
3. Enter desired destination.
4. Press [save]. The display shows:

```
immediate              delay
```

5. Press [delay].
6. Dial the delay time (1-9) seconds.

Cancel

Dial [✳] + [9] + [✳].

Operation

1. Go off-hook.
2. Wait for the delay time to expire.

Conditions

- Operation of Hot Line to a Station, Speed Dial Bin or CO line, that is not valid or programmed, results in an error tone.
- If used for 911 (emergency), it must be tested regularly to verify proper operation.

Hour Mode Selection

Description

Standard 12-hour time or military 24-hour time can be selected for common display at all Executive Key Telephones. The correct system time is entered in system programming along with the Hour Mode Selection, from any Executive Key Telephone station using the system programming password. The AM and PM indications are not displayed.

When programming related features, military 24-hour time is referenced.

Programming

The displayed hour format at Executive Key Telephones may be selected for 24-hour or 12-hour format.

Intercom Call

Description

All intercom calls are made by dialing the station unique 3-digit *DHS-L* intercom number. If a station feature button is programmed as a BLF/DSS button, it may be used to place an intercom call. Any intercom call can be placed hands-free without lifting the handset. However, acoustic conditions at the local and/or distant station may dictate the use of the handset to achieve optimum voice connection.

Each station user determines how intercom calls are received; either in Voice Announce mode or Tone Ringing. The intercom calling station can force the called station from Voice Announce mode to Tone Ring mode by pressing [✳] after dialing the station number.

Operation

To place an ICM call:

1. Dial the *DHS-L* 3-digit station number on the telephone dial pad.

```
CALLING STA xxx
  cbck   msg
```

2. Ringback tone is heard or if the called station is in Voice Announce mode, a connection is automatically selected.

```
VOICE CALL  xxx
        msg
```

3. If the called station is busy, busy tone is heard.

```
STA       xxx   BUSY
  cbck   msg   next
```

4. If the called busy station has Call Wait enabled, ringback tone is heard.

```
STA       xxx   WAIT
  cbck   msg
```

Other Displays:

- When the station is in DND:

```
STA       xxx   DND
```

- If the station number dialed is not connected:

```
OUT OF SERVICE
```

- If the called station is your own station number.

```
YOUR NUMBER
```

Conditions

- Intercom dial tone may be automatic upon lifting the handset or after pressing the [SPKR] button, if enabled under the Auto Line Select [FEAT] + [9] + [5] station feature.

Intrusion (Privacy)

Description

Factory default settings provide privacy for all intercom and CO line calls. These calls may not be monitored or interrupted by other stations. If the Intrusion Release are available to you may use this feature to override the Intrusion feature.

Release

Description

Intrusion Release may be enabled on a per station basis to allow up to three users to join a conversation on busy CO lines (maximum of 4 users). When Intrusion Release is enabled through programming, you may press a busy CO line button at an idle telephone to join that conversation.

Operation

ENHANCED/EXECUTIVE TELEPHONES –

1. Dial the desired station number.
2. When busy signal is heard, dial [8].

When you want to join a conversation on a busy CO line:

1. Dial the busy station number. The display shows:

```
STA XXX BUSY
  msg next
```

2. When a busy tone is heard, press [next].

```
STA  XXX  BUSY
 camp   voice   intru
```

3. Press [intru]. The display shows:

```
INTRUS  STA  XXX
```

Programming

Intrusion Release is a system wide setting that affects how the privacy feature functions at stations busy on CO line conversations. When set to Y the Intrusion feature is effectively removed for stations with a lower level COS when a station with a higher or equal COS wants to join the CO line conversation in-progress. To join a CO line conversation in-progress a station with higher or equal COS simply presses the busy CO line button. Refer to the description under Day Class for more details on rules of joining calls in progress. When set to N, no station will be able to join an existing CO line conversation by simply pressing the busy CO line button.

Intrusion Release will only function by pressing a CO line button. Group access (Pool) buttons cannot be used to invoke Intrusion Release.

Disabling of the Intrusion feature may be limited by federal, state or local law, so check the relevant laws in your area before disabling Release Tone.

EXECUTIVE TELEPHONES –

After entering your password in Database Programming:

1. Press [show]. The display shows.

```
SHOW STA  :  ___
bksp   show   chg
```

2. Enter desired station number.
3. Press [show].
4. Press [next] until you reach the following display:

```
INTRUS. ACTIVE  :  N
back   next   chg
```

5. Press [chg] and enter Y (yes).
6. Press [clear] when completed.

Default

The *DHS-L* Intrusion Release is set to N (NO), and can be toggled Y/N.

Related Programming

Refer to *"Day Class of Service (COS)"*.

Release Tone

When set to Y a tone will be heard on the voice path of the in-progress call when a station joins a conversation via Intrusion Release. When set to N, no tone is heard. Disabling the tone can be useful for monitoring of call group employees and training requirements.

Default

DHS-L Intrusion Release Tone is set to Y.

Disabling of the Intrusion *feature may be limited by federal, state or local law, so check the relevant laws in your area before disabling Release Tone.*

Conditions

An Attendant:

- Cannot intrude on an Attendant in another Tenant group.

- Can intrude on members in another Tenant group.

A Tenant Group Member:

- Can only intrude on a member in another Tenant group when a member in one Tenant group has Intrusion Accept enabled, and another Tenant member has Intrusion Active enabled.

Last Number Redial (LNR)

Description

The Last Number Redial (LNR) feature automatically dials the last number dialed from your telephone. LNR will repeat a hook-flash in the same sequence as it was first dialed. If a speed dial number was first dialed, LNR will dial the speed dial number and any subsequent manually dialed digits. A maximum of 16 digits can be stored in the LNR buffer for every station.

Operation

You may either choose a specific CO line for use with LNR by first pressing that CO line button or you may allow the line to be selected automatically by the LNR feature.

1. Press a line button.
2. Press [FEAT].
3. Dial [8]. The previously dialed number is dialed on the CO line selected.

4. In the event that all CO lines are busy, you will hear busy tone and if you have an Executive Telephone, it will display:

```
ALL  CO  LINES  BUSY
```

5. If the Last Number Redial memory is empty, you will hear error tone and an Executive Telephone will display:

```
LNR  EMPTY
```

The LNR feature code may be programmed on a programmable feature button.

Conditions

- Last Number Redial cannot be applied to intercom calls.
- When you activate LNR, the system will first select the previously used CO line to dial. If that CO line is busy, any idle CO line in the same CO line group will be selected. If all CO lines are busy, you will hear busy tone and an Executive Telephone will display ALL CO LINES BUSY.
- The system programming data fields Dial Wait Time and Dial Tone Detection directly affect the performance of LNR. When these features are enabled, the telephone will either wait until dial tone is detected on a CO line, or wait for a pre-programmed period of time before digits are dialed from the LNR memory on the CO line.
- To LNR immediately depends on whether tone detection is allowed or pause timers apply. If tone detection is allowed, the system will Redial the last number after CO dial tone is detected. Otherwise, the system will Redial the last number only after the pause time for tone detection is exceeded.

Loud Bell Control (Optional)

Description

The system provides two dry contact closure for interface to an external Loud Bell device which is associated with incoming CO line ringing. If Loud Bell is assigned to a specific CO line, the incoming call signaling on this CO Line will initiate LBC operation. The Loud Bell contacts will follow the CO ring cadence programmed in system programming (data field Ring Scheme). The external loud bell ringing device is customer provided. It is recommended that a 24V DC 0.5 amp device be used. An external power source is required.

Programming

When set to Y the Loud Bell Contact will operate ring cadenced closure while this CO line is ringing. The ring cadence of the Loud Bell contact follows the Ring Scheme programmed in Resource.

Default

The *DHS-L* Loud Bell Contact is set to N (NO), and can be toggled from Y/N.

Message

Outgoing

Description

You can send a message waiting, a customized message, or one of 6 pre-programmed messages to other Executive Key Telephone users on the system. A basic message waiting is sent by pressing the soft [call me] button. You may customize the last message by using the dial pad and selecting letters (16 characters maximum) to spell your message. You can send up to 6 messages (on a per station basis) by simply pressing the [send] button (soft button) when the desired message is displayed.

Operation

When you dial another Executive Key Telephone, you will be given the option to leave a message:

```
STA  xxx
CBCK       MSG
```

Press [msg] and the display changes to:

```
MESSAGE TYPE
CALL ME          PREPROG
```

To send a Message Waiting:

Press [call me].

To send a customized message:

1. Press [preprog]. The display shows:

```
HAVE A NICE DAY
  send next
```

2. Press [next] until the following displays:

```
7 ____ EMPTY
  chg
```

3. Press [chg].

```
_
 bksp save chg
```

4. Spell the message (16 letters/symbols maximum) using the dial pad keys.
5. For instance, to select the letter H, press dial pad key [4] twice.

Table 3-16: Dial Pad Key Programming

Depressions:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	✳	**0**	**#**
1st	Q	A	D	G	J	M	P	T	W	*	*	†
2nd	Z	B	E	H	K	N	R	U	X			
3rd	_	C	F	I	L	O	S	V	Y			

* *Dial Key [0] is used to select special characters.*

† *In some cases, you may wish to select letters accessed by the same dial pad key. After you select the first letter, dial [#] to accept that letter and advance to the next position to dial the next letter. For instance, to spell TOM you would dial [8] + [6] + [6] + [6] + [#] + [6].*
Dial [#] to insert a space.

To send a pre-programmed message:

1. Press [next]. The display shows:

```
CALL OPERATOR
  send   next
```

2. Continue pressing [next] until the desired message is displayed. The programmed messages are as listed in *Table 3-17*:

Table 3-17: Available Outgoing Pre-Programmed Messages

HAVE A GOOD DAY
CALL OPERATOR
CALL HOME
CALL BACK
FRIEND VISITING
URGENT
EMPTY (custom msg)

3. Press [send].

To view a message:

1. The Message Wait button will flash and the display shows:

```
MW FROM STA xxx
      show  del
```

2. Press [show] to display the message sent to you.

Premise (Messages)

Description

Premise messages provides you with a method to inform intercom callers of the reason you are away from your telephone. A Premise message can be pre-programmed in the system database and may contain up to 16 characters or digits. There are six pre-programmed messages and one private message which may be edited at your telephone according to your personal preference. The message you select will appear on your telephone's display. Any Executive key telephone that intercom calls (tone ring only) you will view that message on their display.

Operation

To program a message:

1. Press [FEAT].
2. Dial [9] + [0]. The display will show:

```
OUT FOR LUNCH
 store    next
```

To customize a message:

1. Press [chg].
2. Use the dial pad keys to enter your personalized message. *Table 3-16: Dial Pad Key Programming* to determine how to select desired letters.

To select a pre-programmed message:

1. Press [next].

```
OUT FOR LUNCH
 store    next
```

2. Continue pressing [next] until the desired message is displayed. The pre-programmed messages are as listed in *Table 3-18*:

Table 3-18: Available Premise Pre-programmed Messages

OUT FOR LUNCH
BE BACK SOON
LEFT FOR THE DAY
IN A MEETING
OUT OF OFFICE
ON VACATION
Empty

3. Press [store].

The Premise Message feature code may be programmed on a programmable feature button.

When another Executive Key Telephone user calls you, the message OUT FOR LUNCH will be displayed on the caller's telephone display:

```
OUT FOR LUNCH
 cbck   msg
```

The caller has the option of using the Call Back feature or leaving a message for you.

Programming

Two types of Preprogrammed Messages; OUTGOING MESSAGE and PREMISE MESSAGE. The OUTGOING MESSAGE works with Message Wait and allows the Executive Key Telephone user to leave a text message at another Executive Key Telephone.

The PREMISE MESSAGE may be enabled to notify other Executive Key Telephone callers of the users status. This message will be displayed whenever another Executive Key Telephone user calls the Executive station with this feature enabled.

The first message prompted at the Executive Telephone for both OUTGOING MESSAGE and PREMISE MESSAGE can be customized by the user during setup. The remaining messages can be pre-programmed here.

Messages may be up to 16 characters.

Default

The *DHS-L* OUTGOING and PREMISE messages are:

OUTGOING—

- CALL OPERATOR
- CALL HOME
- CALL SCHOOL
- VISITORS WAITING
- URGENT
- COME SEE ME

PREMISE —

- OUT FOR LUNCH
- BE BACK SOON
- LEFT FOR THE DAY
- IN A MEETING
- OUT OF OFFICE
- ON VACATION

Message Waiting

Description

A busy or unattended station may be notified of a call attempt via the Message Waiting feature. At the Executive Key telephone, the display will show messages waiting and provide prompts to assist you in responding to the messages. Executive telephone users have the choice of leaving a simple Call Back Message Wait or a pre-programmed message.

For non-display telephones (Enhanced), a message waiting button may be programmed on a feature button. The red lamp for that programmed button will flash to notify the user of messages waiting.

Operation

ENHANCED TELEPHONES –

To send a Message Waiting:

1. Dial the station number where the message is to be left.
2. Dial [9].

To answer a Message Waiting:

1. Press [FEAT].
2. Dial [9] + [6] or press a flashing MESSAGE WAIT button (if a feature button has been programmed for Message Wait).

EXECUTIVE TELEPHONES –

To send a Message Waiting:

Upon calling Station xxx and receiving no answer or busy, one of the following will display:

```
STA  xxx
 cbck  msg
```

- or -

```
STA     xxx      BUSY
 cbck   msg    next
```

[cbck] won't be displayed unless called station is in tone mode.

1. Press [msg].

```
MESSAGE TYPE
 call   me   preprog
```

2. Press [call me]. You will hear confirmation tone.

```
MSG   TO   STA      xxx
```

To answer a single Message Waiting:

1. Your telephone display shows the following and the Message Waiting lamp (if a button is programmed) will flash:

```
MSG  FROM  STA  nn
        reply       del
```

2. Press [reply] to answer the message or [del] to delete the message without replying.

To answer multiple Message Waitings:

1. Your telephone display shows the following:

```
MSG  FROM  STA  xxx
  more  reply    del
```

2. Press [more] to review the other messages.

To cancel all Message Waiting indications left at your station:

1. Press [FEAT].
2. Dial [✳] + [9] + [6].

To cancel a Message Waiting left at another station:

1. Press [FEAT].
2. Dial [✳] + [#] + [9] + (station number).

Conditions

- The system will allow a total of 48 message waitings in the system at any one time.
- At Executive Key telephones, the message waiting indication (MWI) will not be removed until [reply] or [delete] is pressed.
- Each station can leave only one message waiting at any one station; for example, Station (A) cannot leave 2 message waitings at Station (B).
- Each station may receive message waiting indications from more than one station.
- A feature button must be assigned on Enhanced models to receive visual MWI.
- Multiple messages are retrieved in the order that they were left.

Music-on-Hold (MOH)

Description

Any intercom or CO line call placed on Hold will hear music, if the system is equipped with an External Music Source. This music source can be monitored at an idle station as BGM music. The *DHS-L* includes both music source interfaces as a standard feature. One source may be used exclusively for BGM, and the other for BGM and Music-On-Hold.

Use of certain music sources for BGM or MOH may violate copyright laws.

Mute

Description

During a conversation, you may prevent the distant party from hearing your voice by disabling voice transmission.

Operation

Press [MUTE] to enable or disable.

The [MUTE] button may also be used for Push-to-Talk operation during a Voice Over Busy call connection.

Muted Ringing

Description

While the user is on another call, incoming ICM/CO line calls will automatically ring at a muted lower level at that station. When the station is idle, incoming calls ring at the loudness level previously programmed from the volume up/down buttons.

Operation

Press [FEAT] + [7] + [6].

On Hook Dialing

Description

You may make outgoing calls without lifting the handset and monitor the dialing status through the built-in speaker. The [SPKR] button lamp is lit when monitoring a call.

The Enhanced and Executive models provide full hands-free speakerphone operation in addition to On-Hook Dialing.

Operation

Press a [CO line] to make a call or dial a [station number] while on hook (handset hung up).

When On-Hook Dialing, the type of line accessed depends upon the individual key telephone pre-programmed selection of intercom, CO line, or no selection (EMPTY).

FEAT#6 (Hot Key) toggles enable/disable function.

Page

Description

You can perform several types of pages:

- Internal Paging - page a group or place a system-wide internal page.
- External Paging - access external/ancillary paging equipment.
- All Call Paging - access all paging zones (internal and external).

Paging is one-way only. The Page Allow/Deny setting does not interfere with a station's ability to make a page or to establish a Meet Me page.

Operation

ENHANCED OR EXECUTIVE TELEPHONES –

To perform internal paging (All Groups):

Dial [400].

To perform external paging:

Dial [820 or 821].

To perform internal All Call paging (Attendant Only):

Dial [425].

To perform group paging:

1. Dial [4].
2. Dial Group Number (01-24).

Any of the paging codes may be stored on a programmable button.

Allow/Deny

Description

You can block one-way pages (internal, group, and all page) over the key telephone speaker by dialing the Page Deny code. You will still hear intercom calls and private voice announcements. Background Music, if enabled, is not affected by the Page Allow/Deny feature.

Operation

To allow page announcements:

1. Press [FEAT].
2. Dial [#] + [9]. The display will show:

```
PAGING ALLOW
```

To deny page announcements:

1. Press [FEAT].
2. Dial [#] + [9]. The display will show:

```
PAGING DENY
```

The Page Allow/Deny feature code may be stored on a feature button.

Conditions

- Stations initiating internal pages may receive error tone if not stations are available in page group. External paging in unaffected.

Meet Me

Description

Anyone paging internally or externally may be answered for a private Meet Me connection. After hearing the page, you can dial the Meet Me Page code from any telephone and be connected to the person paging. During a Meet Me Page, the internal and external paging zones are released and new pages may be initiated.

Operation

1. While a page is currently in progress, an Enhanced or Executive Telephone displays:
2. Press [FEAT].
3. Dial [5] + [9].

The Meet Me Page code may be programmed on any available feature button.

Conditions

- A page may be answered at any telephone using the Meet Me Page code, when the page announcement is heard over the telephone speaker.
- The page may be any zone page or all page.
- Meet Me Page is functional regardless of group assignments.

Pause

Description

You can insert a pause to generate an intentional delay in dialing on outgoing CO line calls. A pause or a combination of pauses may be stored in the Speed Dial bins to allow timed access to special services, while allowing you to monitor the progress of the call. A pause will appear as P on an Executive Telephone display. Last Number Redial will remember any pauses dialed manually.

Operation

1. During dialing on any CO line or when programming a Speed Dial bin (refer to *"Speed Dialing (ABBR)"*), press [FEAT].
2. Dial [7] + [0].

P

Pause may be stored on a programmable feature button and is also used in programming fields that accept a Pause character.

Programming

Whenever the system Pause code is manually dialed while connected to a CO line or when it is programmed into a speed dial bin, the system will pause dialing digits for the length of time programmed here.

Default

The *DHS-L* Pause Time is set for 2.0 sec, and is variable from 1.5/2/3.5/5 sec.

Private Line

Description

The Private Line assignment provides a quick and secure method of programming one or more lines for access by only one station. If the associated Private Line is assigned to a feature button at other stations, the button will light when busy but cannot be accessed from Hold, answered on incoming calls, or used for outgoing access. Calls will not forward and cannot be answered from Park location. The Private Line is used exclusively by the station that is assigned the Private To station in system programming.

Conditions

- Incoming calls signaling on a private CO line will ring its associated station regardless of whether the CO line ring assignment is allowed in programming.
- Private Line programming will override CO line ring and CO line receive.

Programming

Private To is a programming time saver. This parameter allows the programmer to assign a specific CO to one station for their personal exclusive use. This setting over-rides CO Line Assignment programming. When a station is assigned as the Private To station of a CO line, that station exclusively receives ringing and access privileges to that CO line.

Default

The *DHS-L* Private To is Empty (not assigned to any station). The Station range is from 201-272 and 301-372.

Pulse To Tone Switch-Over

Description

When the system is connected to Dial Pulse (rotary) outgoing CO lines, you may manually force the system to output DTMF tones for access to special services over the same Dial Pulse CO line.

Operation

When on a dial pulse CO line, dial [✳]. All subsequent digits are sent as DTMF digits.

Pulse to Tone Switch-Over can be programmed in any Speed Dial bin.

Conditions

- The dialing conversion can only be from Pulse Mode to Tone (DTMF) mode.

Recall (Transfer Recall)

Description

Transferred CO lines will recall to the transferring station if the call is unanswered after the Recall Time expires. During the recall, the outside party continues to hear the transfer Ring Back tone, and the CO line returns to System Hold.

Operation

When a transferred CO line recalls, the display at an Executive Key Telephone will indicate where the initial transfer was routed:

```
LNxxx RECALL
STATION
```

Recalls are not directed to the programmed Alternate station.

Programming

Recall Time is associated to CO Line Transfer. When the Recall Time expires the CO line will begin ringing at the station that initially transferred the call.

Default

The *DHS-L* Recall Time is set for 30 sec, and is variable from 16/30/60/90/120 sec.

Reminder Tones

Description

If you have Do Not Disturb or Call Forward enabled, you will hear a Reminder Tone whenever you access intercom dial tone. The Reminder Tone is a distinctive interrupted stutter dial tone. Once you dial a digit, the Reminder Tone is removed until the next time you access intercom.

Ringing Line Priority

Description

Ringing Line Priority is a system-wide feature that automatically connects incoming calls based on a predetermined priority. The ringing station is automatically connected to the priority ringing facility, upon lifting the handset or pressing the [SPKR] button.

Ringing Line Priority can be overridden at the station by first pressing a direct appearing line, CO line group, feature button or by dialing an intercom number on hook.

The priority is:

1 -- Intercom Call Back
2 -- Camped CO Line
3 -- Recalled CO Line call
4 -- Transferring CO Line call
5 -- Incoming CO Line call
6 -- Incoming ICM call

Operation

To pick up an incoming call:

Lift the handset or press the [SPKR] button when station rings.

Save Dialed Number (SDN)

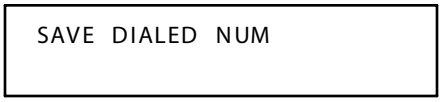
Description

Save Dialed Number (SDN) is normally used whenever you want to retain a telephone number to be dialed later. Once stored, that number will be recalled when you dial the SDN code, regardless of what feature operations or numbers have been dialed at your telephone since you stored the number.

Operation

After dialing a number that is busy or is not answered:

1. Press [FEAT].
2. Dial [5] + [1]. At an Executive Key Telephone, the display shows:



To dial a saved number:

1. Press [FEAT].

2. Dial [5] + [1]. The telephone attempts to access the same CO line used when the number was saved. If it is busy, another CO line in the same group is accessed and the number is dialed.

Conditions

- The SDN is a maximum of 16 digits.
- If the SDN buffer is empty, the display will show NO SAVED NUMBER.
- If all CO lines are busy, the display will show ALL CO LINES BSY.

Save Dialed Number feature code may be stored on any feature button.

Speed Dialing (ABBR)

Description

Speed Dialing allows you to store frequently dialed numbers. These numbers are selected for dialing by the appropriate bin number. The feature code and bin number may be stored on any feature button for instant, one-button operation.

Each station may store 50 personal (station) speed numbers in memory (bins 500-549) consisting of up to 16 digits each. There are also 100 Speed Dial bins allocated for system-wide use (bins 600-699).

System Speed Dial is programmed in System Programming.

Maximum speed dial bins = 1000

By default, stations are not assigned speed bin numbers.

Operation

ENHANCED TELEPHONES –

To store a telephone number in a personal Speed Dial bin:

1. Press [FEAT].
2. Dial [1].
3. Dial the bin number in which to store the telephone number.
4. Dial the telephone number.
5. Press [HOLD]. You will hear confirmation tone.

Speed bins may be chained. Pauses and Flashes may be stored in Speed Dial. Chaining Pauses and Flashes each occupy one character position: Pause = [FEAT] + [7] + [0] = P; Flash = [FEAT] + [3]

To erase the contents of a Speed Dial bin:

1. Press [FEAT].
2. Dial [1].
3. Dial the bin number (500-549) to erase.
4. Press [HOLD]. You will hear confirmation tone.

EXECUTIVE KEY TELEPHONE –

To store a telephone number in a personal Speed Dial bin:

1. Press [FEAT].
2. Dial [1]. The display shows:

```
ABBR DIR #   : __
 bksp   show   chg
```

3. Dial the bin number (500-549) where you want to store the telephone number. (You can press [bksp] and [chg] to correct errors.)
4. Press [show]. The display shows the current contents of that bin:

```
EMPTY
                chg
```

5. Press [chg]. The display shows:

```
__
 bksp   save   chg
```

6. Dial the telephone number to be stored (up to 16 digits).
7. Press [save].

To continue storing telephone numbers in additional bins:

Repeat Steps 3 through 5 (for Enhanced Telephones) and 3 through 7 (for Executive Telephones).

To erase the contents of a Speed Dial bin:

Press [save] instead of dialing a number in Step 4 (Enhanced) and Step 6 (Executive).

To exit speed dial programming:

Press [CLEAR].

To chain together Speed Dial bins:

Enter [FEAT] + [1] + [BIN #] as part of the number in any speed bin to dial that bin contents, after the contents of the current bin.

```
16025551212 @ 00
                chg
```

To dial a number stored in Speed Dial:

The system automatically select the line.

Dial the desired bin number (500-549):

Setting Up System Speed Dial Programming

To program a system speed dial bin:

1. Enter Database Programming.
2. Press [next] until you reach **Resource**.
3. Press [show].
4. Press [next] until you reach **Sys Abbbr No.**
5. Press [show].
6. Enter tenant number.
7. Press [show]. The display shows:

```
ENTER ABBREV. NO
```

8. Press [show].
9. Press [chg].
10. Enter desired phone number and press [save].
    (The ABBR NO screen returns to enter other tenant numbers.)

System Speed Dial Number Assignment (600-699)

In System Programming mode:

1. Press [next] until you reach **System Application**.
2. Press [next]. The display shows:

```
INDIVIDUAL
back  next  show
```

3. Press [next]. The display shows:

```
COMMON LIST
back  next  show
```

4. Press [next]. The display shows:

```
SHOW TENANT
bksp  show  chg
```

5. Press [show]. The display shows:

```
TO INCREASE : XXX
back  next  chg
```

6. Press [next]. The display shows:

```
TO DECREASE : XXX
back  next  chg
```

Station Speed Dial Number Assignment (500-549)

In System Programming mode:

1. Press [next] until you reach **System Application**.
2. Press [show]. The display shows:

```
ABBR NO. ASSIGN.
back  next  show
```

3. Press [show]. The display shows:

```
SHOW STA  :  ___
bksp  show  chg
```

4. Press [show]. The display shows:

```
TO INCREASE : XXX
back  next  chg
```

5. Press [next]. The display shows:

```
TO DECREASE : XXX
back  next  chg
```

Default

By default, all *DHS-L* System Speed Bins are EMPTY, and the allowable programmable digits are: Digits (0-9) [✳], [#], pause (F + [7] + [0]), Flash (F + [3]), and (F + [1] + nnn) for chaining (up to 16 characters).

By default, stations are not assigned speed bin numbers.

Conditions

- Only an Executive Key Telephone can program System Speed Dial bins using System Programming.
- If you access an empty bin, the display will show SPEED NO. IS EMPTY.

Station

Copy

Station Copy is provided to assist in programming multiple stations with the same data. Follow the displayed instructions to copy one station data fields to another.

Station Number range is 201-272 and 301-372.

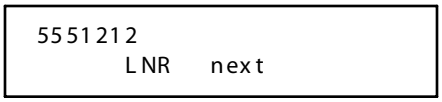
Feature Status Check

Description

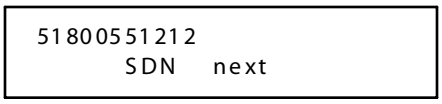
The Executive Key Telephone user can quickly determine the status of all user-controlled features. This feature is useful for the technician as well as the user since some feature conditions may not be evident if they are not programmed on an available programmable feature button. The current status can be observed using the soft interactive buttons.

Operation

1. Press [FEAT]
2. Dial [#] + [8]. The display shows the contents of the Last Number Redial memory.



3. Press [next]. The display shows the contents of the Save Dialed Number memory.



4. Continue pressing [next] to display the status of the remaining features:

User Saved Number	Hot Line	Night COS	Data Auto Ans
Telephone Lock	Position	Warning Tone	ECF Operation
Data Rate 9600	Tenant	Drop Timeout	SMDR Output
Auto Hold	Pickup Group	Intrus Active	Night Svc Ext
Voice Call	Paging Group	Intrus Accept	
Page Receiving	Day COS	Intrus Tone	

Drop Time-Out

Similar to Warning Tone, Drop Time-Out may be applied to any station where outgoing call length is to be restricted. When set to Y this station will receive a warning tone over the connected voice path when the Warning Time has expired, and 10 sec later the current call will be terminated.

Default

DHS-L Drop Time-Out is set to N (NO) for all stations.

Groups

Description

The system provides 6 Tenant Groups for partitioning the system into separate departments or related features. Members of a Station Group have the ability to pick up incoming or transferred calls from other associated members in the same group. Unlike Directed Call Pickup, you do not have to know or remember the ringing station's intercom number.

Stations may be assigned to one of 24 available Pick Up or Paging Groups. As a Station Group member, you also receive Internal Zone Pages directed to your Station Group. Station Groups are assigned in system programming.

Default

All *DHS-L* stations default to Tenant Group 1. The Tenant Group range is from 1-6.

Numbering Plan

Description

All stations on the *DHS-L* receive a 3-digit ICM number for inside calling. The 3-digit directory ranges from (201-272, 301-372). Before a station can be assigned a directory number already in use, the other station must be re-assigned to a new vacant number.

Programming

The Installer can customize the Numbering Plan. The default Ranges for each Item are 1-6. As each subsequent item is reviewed, the scrollable options available will be the one currently selected for that Item plus any unassigned codes.

By default, 1, 2, 7 and 8 are used which leaves 3, 4, 5, and 6, plus the number currently assigned to that Item in the scroll list.

Use this feature only at initial installation. Changing this feature after initial installation requires the reprogramming of flexible buttons. Use of the leading digit 7 for stations or groups may cause conflicts with AVP/Dispatch Voice Mail.

Parameters

When the SHOW STATION prompt is displayed, the programmer should enter the three-digit Station number on the dial pad. Once entered, the center Soft Button [show] is pressed to enter into Station Programming Parameters for that station number.

Default

The *DHS-L* station range is from 201-272 and 301-372.

Position

Station numbering can be changed for any Station Port between the system allowable range. If the current assigned station number is not desired or must be changed, the programmer may select any of the available station directory numbers to reassign this port.

Default

DHS-L ports = 201-272 and 301-372

Time

Description

The system provides a built-in clock to track System Time for certain features such as System Night Service Mode Change, SMDR Call Message Recording, Alarm Clock Check, etc. This clock is battery protected from power failure by a battery provided inside the KSU. System Time can be changed at any Executive Key Telephone using the attendant password or system programming.

Station Lock/Unlock

Description

You may use this feature to prevent unauthorized outside calling from your telephone. The feature code is also used to program your private 4-digit password number. Default password = 0000.

Use of Station Lock [Feat 97] will restrict access to 911.

Operation

ENHANCED TELEPHONES –

To lock the telephone:

1. Press [FEAT].
2. Dial [9] + [7].
3. Dial your password.

4. Dial [#].

To unlock the telephone:

1. Press [FEAT].
2. Dial [9] + [7].
3. Dial your password.
4. Dial [✳].

To change your password:

1. Press [FEAT].
2. Dial [9] + [7].
3. Dial your current password.
4. Dial the new password.

Executive Telephone

To program Station Lock/Unlock:

1. Press [FEAT].
2. Dial [9] + [7]. The display shows:

```
CHK PSWD__
  bksp  show  chg
```

3. Dial your password (default is 0000).
4. Press [show]. The display shows:

```
LOCK TELEPHONE
 pswd  yes   no
```

To lock the telephone:

Press [yes] . The display shows:

```
PHONE LOCKED
```

To unlock the telephone:

Press [no]. The display shows:

```
PHONE UNLOCKED
```

To change your password:

1. Press [pswd]. The display shows:

```
NEW PSWD : __
  bksp   save   chg
```

2. Dial your new password (up to 4 digits). The display shows:

```
NEW PSWD : 1234
  bksp   save   chg
```

3. Press [save].

The Phone Lock feature code may be programmed on a programmable feature button.

Conditions

- When your telephone is locked you can only make intercom calls. You may still answer calls and held lines while your telephone is locked. This includes speed dial access and CO lines marked as toll override.
- If you accidentally forget your password it may be retrieved through the system database administration password.
- The Attendant's private password is used to enter Attendant Administration.
- If you try to make a CO line call from a locked telephone, you will hear error an tone and the display will show PHONE LOCKED.

Station Message Detail Recording (SMDR)

Description

This feature allows the system administration to track all incoming and outgoing CO line traffic. Station Message Detail Recording (SMDR) is output from the SMDR RS232 serial port located on *DHS-L* Central Processor Board. An external serial printer or call accounting device may be connected for permanent record keeping or call cost accounting. Data communications is one direction only through this port and is programmable for data rate selection in system programming.

If entered, an account code may also be output for each call record. SMDR information includes CO line used, station number, time and date the call was placed, number dialed, duration of the call, Ring Time to Answer, an account code (if entered), and a comment for special call handling record. The system will also provide ring-in duration and call processing information relative to the call as it was handled by the system.

Refer to *Table 3-19: SMDR (Data Examples)* for data examples.

Table 3-19: SMDR (Data Examples)

STA	TRK	DGT_DIALED	RING	DATE	TIME	DURATION	ACCOUNT	BR	CMT
	XXX	XXXX...XXXX	MM:SS	XX/XX	HH:MM:SS	HH:MM:SS	XXXXXXXX		XXXX
211	01		00:00	01/02	11:15:55	00:00:47		$	LNH
210	03	12345678901234		01/02	11:10:36	00:02:54	12345678	$	LNC
214	01	555-1212		01/02	11:09:43	00:00:51		$	LNC
210	01		00:32	01/02	11:15:36	00:00:52		$	LNC
211	01		00:00	01/02	11:15:36	00:00:47		$	LNC
211	01	443-6000		01/02	01:53:36	00:00:33		$	LNC
221	02	602-443-6000	00:03	01/02	02:53:36	00:00:39		$	LNC
221	02	VODAVI COMM	00:03	01/02	02:53:36	00:00:39		$	LNC
UNANSWERED CALLER ID SMDR OUTPUT SAMPLE RECORD (FEATURE PACKAGE 2)									
ST	**TRK**	**DGT_DIALED**	**RING**	**DATE**	**TIME**	**DURATION**	**ACCOUNT**	**BR**	**CMT**
NA	02	602-555-1212	00:53	01/01	01:53:12	00:00:00	12345678		
NA	02	ABC Incorporated	00:53	01/01	01:53:12	00:00:00	12345678		

ACCOUNT = Account code entered for billing purposes (maximum 8 digits, left aligned)
BR = Battery reversal detected
CMT = Comment
DATE = Day/Month (DD/MM)
DGT_DIALED = Telephone number (outgoing call only, maximum 16 digits, left aligned)
DISA = CO line call is established through DISA feature
DURATION = Conversation time
ECF = CO line call is established through ECF feature
HH = hour
LNC = CO line call is invited into conference, but is released by the output station number
LNH = CO line call held by another station, later answered and released by the output station number
MM = minute
RING = CO line incoming ringing duration before answer (Incoming call only)
SS = second
STA = Station number/Incoming DISA CO line number/Incoming ECF CO line number
TIME = Start time of call conversation
TRK = CO line number, 2 digits with prefix 0

NOTE: A carriage return (CR) is generated after each record output.

Conditions

- The system will retain 44 records in the event the external device (printer) becomes inoperative. These records will print the moment the device is reconnected.
- CO line calls must exceed 10 seconds for an SMDR record to be generated.
- Data format is no parity, 8 data bits, 1 stop bit. Baud rate is adjustable.

- In the last 2 lines of the SMDR record sample (Extension 21 used), caller identification SMDR records are illustrated.

The SMDR RS232C serial port default setting is 9600 baud.

System

Ring Scheme

The system may be set to three different ringing schemes. In Scheme 0 and 2, ringing is differentiated by cadence so that a user is aware of the type of call ringing at his station by the tone cadence. In Scheme 1, ringing of both intercom calls and CO line calls is the same.

This option is provided when the application requires that ringing adhere to RS-478 ring cadence specifications.

Table 3-20: System Ring Scheme

	SCHEME 0	SCHEME 1	SCHEME 2*	SCHEME 3
ICM Tone Ringing	1s ON, 4s OFF	1s ON, 5s OFF	300ms ON, 400ms OFF, 300ms ON, 5s OFF	300ms ON, 400ms OFF, 300ms ON, 2s OFF
CO Line Ringing	300ms ON, 400ms OFF, 300ms ON, 4s OFF	300ms ON, 400ms OFF, 300ms ON, 5s OFF	1s ON, 3s OFF	1s ON, 2s OFF

* *Recommended for Voice Mail.*

Default

The *DHS-L* defaults to Ring Scheme 2.

Time

Provided to set system time and date information. Use prompts displayed to set fields:

YEAR	WEEKDAY
MONTH	HOUR
DAY	MINUTE

System Time can be set through Attendant Administration using the Attendant Station password.

Programming

1. Enter Database Programming.
2. Press [FEAT] + [#] + [*] and enter password.
3. Press [show].
4. Press [next] until you reach Hour Mode.
5. Press [chg].
6. Press [next] until you reach System Time.
7. Press [show].
8. Enter 2-digit year.
9. Press [next] and then [chg] after each selection:

YEAR	WEEKDAY
MONTH	HOUR
DAY	MINUTE

Tone Detector

The system provides 8 tone detectors which are used for certain features to detect the call status of the CO line call in progress. Those features which use the tone detector include DISA, External Call Forward, Last Number Redial and Save Dialed Number, Automatic Busy Redial and Dial Tone Detection.

Programming

The system Tone Detectors on the DTMF Receiver may be used to detect the presence of dial tone before dialing begins. This function will affect both automated features and manual dialing. When engaged, the function has the effect of delayed dialed digits when manually dialing. It is recommended that this feature only be used in cases where dialing problems persist.

Dial Wait Time

Similar to the Dial Tone Detect feature, Dial Wait Time can be used to delay out dialing based on a timer instead of a Tone Detector for applications where the provided dial tone cannot be properly detected by the built-in Tone Detectors. This feature should only be used in cases where dialing problems persist.

Default

The *DHS-L* Dial Tone Detect is set to (N) disabled, and can be toggled from (Y/N).

However, if CO dial tone is slow and dialed digits are being sent before CO dial tone is ready, the Dial Wait Time may be used to eliminate the problem by imposing a fixed wait period before digits are sent.

Dial Wait Time is set to zero (no delay), and the range is programmable from 0-8.

Conditions

- Only one station is allowed to wait for the tone detector to become available.
- When the tone detector is currently assigned to a station, the maximum allowed time to wait for CO dial tone is 6 seconds (default).
- If no CO dial tone is detected within 6 seconds, the tone detector will be returned to idle, or assigned to another waiting station. The number entered will then be dialed.
- In the unlikely event that more than one station requests a tone detector at exactly the same moment, those stations will hear internal busy tone immediately, although a tone detector may be available.

Tone/Inter-Digit Duration

Description

Depending on the type of CO, and the customer specialized dialing requirements, the TONE TIME and INTER-DIGIT time may be modified for manually-dialed or system automatically-dialed digits. Typically, no modification of tone/inter-digit duration is required. However, in some installations where line conditions are poor, tone duration and/or inter-digit duration timing may be increased to offset poor conditions. Tone duration and inter-digit duration may be assigned any value (50 to 150 ms).

Programming

Timing can be adjusted such that dialing automatically emulates slow, methodical depressions of the dial pad keys. Note: increasing the digit duration and inter-digit time may also be desirable for applications where the user must dial into an off-site voice mail system or other dial pad key operated device that does not respond well to faster dialing modes. There are two Dialing Ratio parameters that may be programmed; TONE TIME and INT_DGT TIME. Tone Time is the actual duration of DTMF tone that the system will send for each dial pad key pressed while connected to a CO line. Int_Dgt Time is the minimum actual time between DTMF digits that the system will wait before sending the next dialed digit DTMF tone.

Default

The *DHS-L* TONE TIME = 90 msec) and INT_DGT TIME = 800 msec, and the adjustable range is from 400 - 800 msec.

Conditions

- A longer tone duration or inter-digit duration time will cause a slower output of manual or automatic system-dialed numbers.
- A longer DTMF ON time and/or inter-digit tone time can be used to ensure more reliable interaction with remote voice mail and similar remote DTMF dial pad actuated devices.
- Users may experience a delayed DTMF confirmation tone if the tone/inter-digit duration is lengthened.

Transfer

Description

There are four (4) types of transfer you may use: screened, unscreened, voice mail, and one-button transfer. When you conduct a transfer, the outside line is placed on Exclusive Hold and can only be retrieved at your telephone or the telephone where you transferred the call. A screened transfer occurs when you announce the call to the person to whom you are transferring the call.

Operation

To perform an Unscreened CO line or intercom call transfer:

1. Press [HOLD].
2. Dial the station/Hunt Group number where you want to transfer the call.
3. Press [TRANS] to transfer the call unscreened.

To perform a Screened CO line or intercom call transfer:

1. Press [HOLD].
2. Dial the station/Hunt Group number where you want to transfer the call.
3. Wait for the person you called to answer.
4. Press [TRANS] to complete the call transfer.

To use One-Button Transfer:

While on a call, press the pre-programmed [DSS] button.

Auto Transfer MUST first be enabled to use the One-Button Transfer method. Press [FEAT] + [5] + [4] to enable Auto Transfer.

To transfer to a Voice Mail Mailbox:

1. Press [HOLD], then dial the voice mail Hunt group number (e.g., 430).
2. Dial the 3-digit station number of the target mailbox.
3. Press [TRANS] to complete the call transfer.

Do not press the [CLEAR] button when processing an incoming call. This will disconnect the call. The telephone will return to the idle condition following the transfer operation.

Conditions

- Ring transfer recall time for any CO line call is programmable, between 16, 30, 60, 90, and 120 seconds.
- When a transferred CO line recalls, the line number and station number where the call was transferred will be displayed.
- Once the outside line changes from Hold to Transfer status, the outside party will hear Music-on-Hold change to a system-provided Ring Back tone.

- Intercom calls that are transferred, follow the Intercom Selection mode at the destination station (Voice Announce Hands-Free or Tone Ring).
- In screened transfer, if the person that you transferred the call to answers your intercom call in Voice Announce Hands-Free mode, and does not go off-hook to connect with you on an intercom channel, the CO line will transfer ring when the transfer is completed.
- With voice mail transfers, if no VM mailbox digits are entered for transfers, no digits are sent to the VM system.
- If VM mailbox digits are entered for transfers to voice mail, the following digits are sent: XFR prefix, VM mailbox and XFR suffix. The *DHS-L* Hour Mode Selection is in the 12-Hour Format.

UCD Group (Hunt)

Station

Description

Up to 24 Hunt Groups may be assigned. Each Hunt Group can contain up to 24 members. Hunt Group directory numbers are (430-459). Any of the 24 UCD groups may be used for the Voicemail as long as the VM Group is programmed to match the UCD Group. Only one VM group may be assigned to each system.

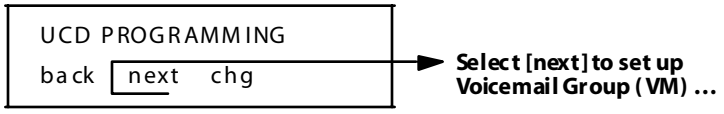
Operation

1. Lift handset.
2. Dial Hunt Group number.

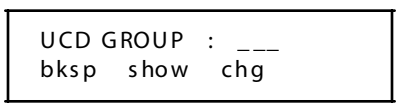
Programming

In programming mode:

1. Press [next] until you reach **Station Application**.
2. Press [show]. The displays shows:

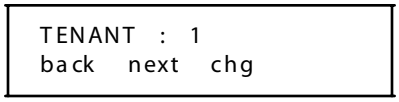


3. Press [show]. The display shows:

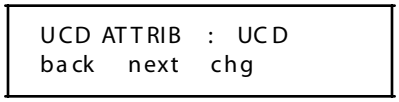


4. Enter group number (01-24).

5. Press [show]. The display shows:

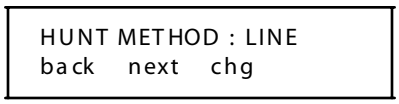


6. Press [next]. The display shows:

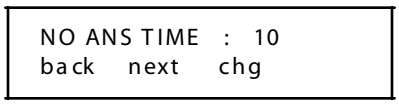


7. Press [next]. The display shows:

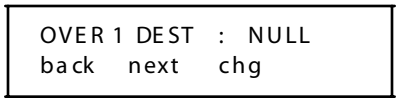
8. Press [next]. The display shows:



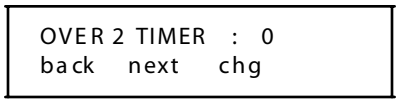
9. Press [next]. The display shows:



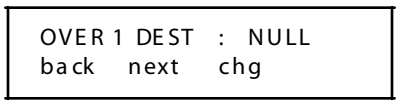
10. Press [next]. The display shows:



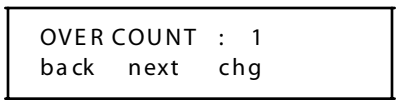
11. Press [next]. The display shows:



12. Press [next]. The display shows:



13. Press [next]. The display shows:



14. Press [next]. The display shows:

```
REROUTE DEST  :  NULL
back   next    chg
```

Call Forward—Busy No Answer may affect operation of this feature.

In Station Programming… group members in a Voice Mail Hunt Group must be set to Voice Mail-type "Yes".

User Name Programming

Description

An alphanumeric, seven-character user name may be assigned to each station in the system. This name will be displayed on Executive Key Telephones in place of the standard STATION message. Station user names are entered in system programming. The names may consist of upper and lower case letters.

The station user name or department can be programmed to appear on the LCD of an Executive Key Telephone. The station intercom number will also be displayed when a name has been programmed. The name may consist of upper and lower case letters, plus numbers. DSS/BLF buttons may be conveniently labeled to associate stations by name, instead of station number.

Operation

To set up a station/user name:

1. Press [F] + [#] + [✳] to enter Database Programming.
2. Select [Resource] and press [show].
3. Press [next], then press [user name].
4. Enter desired station number, then press [show].
   To enter a name using the dial pad, refer to *Table 3-16: Dial Pad Key Programming*.

Conditions

- When a User Name is programmed for stations, the STA normally displayed at that idle station will be replaced with the programmed name.
- Names may be 7 or fewer characters in length.

User Saved Number Redial (USNR)

Description

When on a CO Call, the user can enter the User Saved Number Redial (USNR) feature code, allowing the entry of any other number (telephone number, FAX number, or even bank account number), as a scratch pad entry for future use. When the station is idle, the user can enter either the SDN ([FEAT] + [5] + [1]) and/or USNR feature codes to make a CO call and dial the number stored.

Operation

To store a USNR number while on a call:

1. Enter the desired number to be stored and press [save].
2. Press [FEAT].
3. Dial [5] + [✳]. At an Executive Key Telephone, the display shows:

SAVE USNR NUM

To Dial:

1. Press [FEAT].
2. Dial [5] + [✳].

Conditions

- The USNR is a maximum of sixteen (16) digits.
- If the USNR is empty, the display will show NO SAVED NUMBER.
- Station COS is applied a the time of use.

The USNR feature code may be stored on any feature button for one-button storing or dialing operation.

Voice Announce (Hands-Free or Tone)

Description

The Enhanced and Executive key telephone models provide the ability to receive incoming intercom calls in Voice Announce Hands-Free mode (VA-HF). When your telephone is in this mode, you can reply to an intercom call by using the speakerphone.

Table 3-21: Voice Announce

Mode	Button Lamp	Display	Tone Heard
Voice Announce Hands-Free	Red	VA-HF Mode Voice Call Allow	Single burst
Tone Ring	No lamp lit	Voice Call Deny	Single burst

Operation

When your telephone is set for VA-HF mode:

1. The call is automatically connected and your display shows:

```
STA          214        CALL
```

2. The display at the calling station reads:

```
VOICE  CALL        211
```

Conditions

- The (SPKR) button lamp will light during hands-free operation.
- To receive intercom calls with Hands-Free, the feature must be enabled.

Voice Mail

Description

When a voice mail system is connected to the *DHS-L* via SLT ports the operation of the voice mail system can be greatly enhanced by preprogramming digit code strings that allow the caller entering voice mail to be diverted to the appropriate menu level. The code that must be entered may be different depending on the call type (CO transfer to VM, intercom call to VM, etc.). The *DHS-L* provides 13 code string fields; including ICM PREFIX, XFR PREFIX, RECORD DGT, ICM SUFFIX, XFR SUFFIX and DIS DGT. The *DHS-L* always sends the station directory number to the voice mail system for calls that are forwarded to VM from Programming.

Programming

After entering System Programming, create a UCD group for voice mail as follows:

1. Enter **Station Application**, then **UCD Programming**.
2. Under **UCD Group Member**, assign the member(s) to the station extension(s) to be used for accessing voice mail.
3. Under **Voice Mail**, in the Voice Mail Table, set up a VM Hunt group by entering the same group number used for the UCD Group assigned in Step 2.
4. Under **Station** -- Set **Port Type** to VM. CO lines will ring to the Hunt group number assigned in Step 3.

Programmable Range

The programmable range for the *DHS-L* Voice Mail Integration fields are as follows:

ICM/VM PREFIX TRANSFER DIRECT FWD BUSY FWD NO ANS FWD DND FWD LN RECALL UCD OVERFLOW RECORD DGT CLEAR MSG	0000-9999, ####, ✳✳✳✳✳
ICM SUFFIX	00-99, ##, ✳✳✳
XFR SUFFIX	00-99, ##, ✳✳✳

DIS DGT	00000000-99999999, ########, *********
PAUSE	FEAT + [4] (displays P)

AVP/Dispatch - Programmable Range

To program prefix/suffix ranges, enter **Station Application** until you reach **Voice Mail**. The programmable range for the AVP/Dispatch Voice Mail Integration fields are:

- ICM PREFIX = P7 (FEAT [4] + [7] + save)
- ICM SUFFIX = ✳
- XFR PREFIX = (leave blank)
- RECORD DIGIT = (leave blank)
- DIS DGT = #99999

Default

The *DHS-L* default settings of associated (Voice Mail Integration) data fields are:

- ICM PREFIX = Null
- RECORD DGT= Null
- ICM SUFFIX = Null
- XFR SUFFIX = Null
- DIS DGT = Null

Configuring *DHS-L* with a Vodavi Voice Mail System

Complete the following steps to configure the *STARPLUS DHS-L* system:

1. **Set Up Voice Mail Ports**
   a. Connect Single Line Adapter box to system (make note of extension numbers), OR install a SLIB card.
   b. Enter programming mode: [FEAT] + [#] + [✳] + [########] + [save].
   c. Press [show] twice.
   d. Enter the first station number to be used as a VM port, then press [show].
   e. Press [next] until PORT TYPE appears.
   f. Press [chg] to select VM.
   g. Repeat **Steps 1-d thru 1-g** for all stations to be entered as VM ports.
   h. When finished, press [hold] twice.
2. **Assign Station Numbers to UCD Group**
   a. Press [next] until STA APPLICATION appears, then press [show].
   b. When UCD PROGRAMMING appears, press [show].
   c. Enter a [1] on the keypad, then press [show].
   d. When TENANT:1 appears, press [next].
   e. When UCD ATTRIB:UCD appears, press [next].
   f. When UCD GP MEMBER appears, press [show].
   g. When MEMBER 1: appears, press [chg].
   h. Enter VM number (port), then press [save].
   i. Press [next], then repeat **Steps 2-g and 2-h** for all VM ports.
   j. Press [hold] three times to return to STA APPLICATION.
3. **Enter Transfer/Intercom Prefixes and Suffixes**
   a. Press [next] to go to the Voicemail screen.
   b. Press [show] until VM HUNT GROUP appears, then press [chg].
   c. Enter Group used in **Step 2-c**, then press [save].
   d. Press [next] until PREFIX TABLE appears, then press [show].
   e. When ICM/VM: appears, press [chg].
   f. Press [FEAT + 4] and dial [7], then press [save].
   g. Press [next] until TRANSFER appears, then press [chg].
   h. Press [FEAT + 4] and dial [7], then press [save].
   i. Press [next] until DIRECT FWD appears, then press [chg].
   j. Press [FEAT + 4] and dial [7], then press [save].
   k. Press [next] until BUSY FWD appears, then press [chg].
   l. Press [FEAT + 4] and dial [7], then press [save].
   m. Press [next] until NO_ANS FWD appears, then press [chg].
   n. Press [FEAT + 4] and dial [7], then press [save].
   o. Press [next] until DND FWD appears, then press [chg].
   p. Press [FEAT + 4] and dial [7], then press [save].

q. Press [next] until LN RECALL appears, then press [chg].
r. Press [FEAT + 4] and dial [7], then press [save].
s. Press [next] until UCD OVERFLOW appears, then press [chg].
t. Press [FEAT + 4] and dial [7], then press [save].
u. Press [next] until RECORD DGT appears, then press [chg].
v. Press [FEAT + 4] and dial [7], then press [save].
w. Press [next] until ICM SUFFIX appears, then press [chg].
x. Dial ✳, then press [save].
y. Press [next] until DIS DGT appears, then press [chg].
z. Enter #99999, then press [save].

Press [clr] … this completes the Voicemail Integration process.

Button

Voice Mail button is used to retrieve voice mail messages, and will flash an LED indicator when there are messages.

Operation

EXECUTIVE TELEPHONES –

1. Press [FEAT] + [#] + [3].
2. Press programmable button you wish to program for the message waiting indicator.
3. Press [chg]. The following options display: DIR and FEAT.
4. Select [FEAT].
5. Press [FEAT] + [6] + [4].
6. Press [save].

ENHANCED TELEPHONES –

1. Press [FEAT] + [#] + [3].
2. Press programmable button you wish to program for the message waiting indicator.
3. Press [2].
4. Press [FEAT] + [6] + [4].
5. Press [HOLD].

Dialing Ratio

There are two VM Dialing Ratio parameters that may be programmed; TONE TIME and INT_DGT TIME.

Default

The *DHS-L* TONE TIME and INT_DGT TIME are set at 120 msec, and the adjustable range is from 60 - 150 msec.

Integration

Description

An ancillary voice mail device may be connected to the system, and you can program a button for access to this feature. In addition, the button provides an indication of voice messages waiting.

Operation

When the Voice Mail system has messages for any station, the Voice Mail button will flash. The display at Executive Key Telephones will show:

```
VM FROM MAILBOX
        REPLY
```

To retrieve a voice mail message:

1. Press the [Voice Mail] button or press the [reply] button on an Executive Key Telephone model. The system will dial the appropriate numbers (according to programming) to the Voice Mail system.
2. Dial your password.

You may forward calls to the Voice Mail system using Call Forward and the Voice Mail Hunt Group number. Calls that you forward to Voice Mail will be forwarded to your mailbox. The person calling will hear your greeting and be prompted to leave a message. Once a message is left, the Voice Mail system will light the Voice Mail button.

The Voice Mail system must be programmed to light Voice Mail buttons as follows:

To turn ON the lamp:

1. Dial [#] + [9] + [6].
2. Dial station number.

To turn OFF the lamp:

1. Dial [#] + [✳] + [9] + [6].
2. Dial station number.

Conditions

- For proper operation of the Voice Mail button, it must be programmed (refer to *SLT Features and Operation,, "Message Waiting"*, and *Table 4-1: SLT Feature Access Codes*, in Chapter 4).
- When an answering machine is connected to the system via a 2 Port Analog Adapter and In-Band (DTMF/Touch Tone) digits must be sent to the answering machine to control its functions, the SLT port must be programmed as type VM.
- If no Voice Mail button is programmed, it will default to flex button 20 on your telephone.

Monitor

Description

Similar to a basic answering machine, you can monitor your forwarded calls at the telephone where they were forwarded during the first few seconds after they are answered by a voice mail port.

When you forward calls to voice mail, your telephone will alert you when a call is being answered at the voice mail.

Operation

When you hear the alert tone (double beep) while on a call:

1. Press [HOLD] or disconnect [CLEAR].
2. Press [FEAT].
3. Dial [6] + [4]. An Executive Telephone will display:

```
MONITOR    VM    CALL
  yes                no
```

4. Press [yes] to monitor the caller leaving a message or [no] to return to idle.

When [yes] or [no] is selected, the caller continues to leave a message, unaware of the monitor feature operation.

5. If [yes] is selected, the display changes to:

```
MONITOR    MODE
  answer          exit
```

6. Monitor mode is established. You may then:
   - Retrieve the caller from Voice Mail by pressing [answer].
   - Return to idle and allow caller to continue leaving a message by pressing [exit].

ENHANCED TELEPHONES –

To enable monitoring:

1. Dial [1]. The MUTE lamp will light.
2. Dial [3] to allow the caller to exit.
3. Dial [1] to be connected to the call.

To disable monitoring:

Dial [3]. The telephone returns to an idle condition.

The feature code may be programmed on a programmable feature button. The green lamp will flash fast to indicate that the Voice Mail Monitor feature is ready.

Programming

The *DHS-L* enables the user of any *DHS-L* key telephone to monitor callers leaving a message in their voice mail box. When a caller is routed from a ringing telephone to a user voice mail box, an alert is presented to advise the user that the feature can be invoked.

Default

The *DHS-L* VM Monitor Time is set for 6 sec, and is variable at 10/20/30/40/50/60 sec.

Conditions

- You may press [MUTE] while monitoring a call to be connected to the caller.
- When you answer a call the programmed Disconnect Digits Table digits are sent to the voice mail port.
- You will hear the alert tone regardless of whether your telephone is idle or busy or in speakerphone or handset mode.
- When the new timer VM MON TIME expires the opportunity to invoke the feature has past.
- The new timer VM MON TIME is added to the Call Handling category of programming and will allow (10/20/30/40/60) second duration to be programmed.
- When you use the VM Monitor feature, a conference is established between yourself, the voice mail port associated to the call, and the caller leaving the voice mail message.
- If you are on a call when the VM Monitor alert tone signals you, you may place the call on hold to enable the VM Monitor feature.
- You may exit the VM Monitor mode by hanging up the handset, pressing [SPKR], or pressing [CLEAR].
- You may monitor only one call at a time.

Port

Single Line Telephone ports that are to be used for connection to a Voice Mail system must be assigned type VM to provide longer DTMF tones. This identifies the port to the system software for special handling.

Default

DHS-L Single Line Telephone ports are set to N (NO), not assigned as a VM port.

Voice Recorder

Description

If you have an integrated voice mail system, this feature will allow you to record internal and external conversations. When the Voice Recorder is activated, a conference is established between the call and the system voice mail group. The conversation is recorded in your voice mail box when the feature is enabled.

Operation

During a conversation:

1. Press [FEAT].
2. Dial [6] + [7]. An Executive telephone will display:

RECORDER SETUP

3. Once the Voice Recorder connection is established, the display will show:

RECORDING

4. Disable the feature at any time by Steps 1 and 2 above or by pressing a [programmed feature button].

Use of this feature may be interpreted as a violation of federal, state or local laws, and an invasion of privacy. Check applicable laws in your area before using this feature.

You may program a button for this feature. During the set-up, the associated lamp for that button will light steady red. When the connection is established, the lamp will light steady green.

Volume Control

Description

You can adjust the volume levels for four functions: Background Music, Ringing, Handset, Speaker. You adjust the volume while the function is in use. The telephone remembers the volume level selected for the next time that function is used. The ringer volume adjustment allows for four volume levels. All other modes allow for eight volume levels.

You may adjust the ringing volume while the telephone is not in use or while it is ringing. If you adjust the volume while the telephone is idle, you will hear a single ring burst to confirm your selection.

Conditions

- The Volume Control affects the receive loudness only. The person to whom you are speaking will not detect an increase in volume.

Warning Tone

Description

A system Warning Tone may be heard repeatedly on specific stations that have exceeded a preset time limit on outgoing calls. This feature is useful in a lobby or retail environment where lengthy outgoing calls are discouraged.

Operation

If a station is set for a 3-minute Warning Tone, the user will hear Warning Tone when 3 minutes has elapsed. The tone will repeat every 10 seconds until the call is disconnected.

Not recommended as a TOLL SAVER option (for specific application use). Warning Tone is only delivered on outgoing CO line calls.

Warning Tone may be applied to any station where outgoing call length is to be limited. When set to Y this station will receive a warning tone over the connected voice path when the Warning Time has expired. Once engaged, the tone will be heard every 10 sec until the CO line call is terminated.

Warning Time

Warning Time is directly related to Warning Tone and Drop Time-out. When the Warning Time has expired, stations subject to Warning Tone and Drop Time-out will receive the associated tone/disconnect.

Default

The *DHS-L* Warning Time is set for 3 minutes, and is variable from 1-8 minutes.

Warning Tone is set to N (NO) for all stations.

Voice Mail

Description

When a voice mail system is connected to the *DHS-L* via SLT ports the operation of the voice mail system can be greatly enhanced by preprogramming digit code strings that allow the caller entering voice mail to be diverted to the appropriate menu level. The code that must be entered may be different depending on the call type (CO transfer to VM, intercom call to VM, etc.). The *DHS-L* provides 13 code string fields; including ICM PREFIX, XFR PREFIX, RECORD DGT, ICM SUFFIX, XFR SUFFIX and DIS DGT. The *DHS-L* always sends the station directory number to the voice mail system for calls that are forwarded to VM from Programming.

Programming

After entering System Programming, create a UCD group for voice mail as follows:

1. Enter **Station Application**, then **UCD Programming**.
2. Under **UCD Group Member**, assign the member(s) to the station extension(s) to be used for accessing voice mail.
3. Under **Voice Mail**, in the Voice Mail Table, set up a VM Hunt group by entering the same group number used for the UCD Group assigned in Step 2.
4. Under **Station** -- Set **Port Type** to VM. CO lines will ring to the Hunt group number assigned in Step 3.

Programmable Range

The programmable range for the *DHS-L* Voice Mail Integration fields are as follows:

ICM/VM PREFIX TRANSFER DIRECT FWD BUSY FWD NO ANS FWD DND FWD LN RECALL UCD OVERFLOW RECORD DGT CLEAR MSG	0000-9999, ####, ✳✳✳✳✳
ICM SUFFIX	00-99, ##, ✳✳✳
XFR SUFFIX	00-99, ##, ✳✳✳
DIS DGT	00000000-99999999, ########, ✳✳✳✳✳✳✳✳✳
PAUSE	FEAT + [4] (displays P)

AVP/Dispatch - Programmable Range

To program prefix/suffix ranges, enter **Station Application** until you reach **Voice Mail**. The programmable range for the AVP/Dispatch Voice Mail Integration fields are:

- ICM PREFIX = P7 (FEAT [4] + [7] + save)
- ICM SUFFIX = ✳
- XFR PREFIX = (leave blank)
- RECORD DIGIT = (leave blank)
- DIS DGT = #99999

Default

The *DHS-L* default settings of associated (Voice Mail Integration) data fields are:

- ICM PREFIX = Null
- RECORD DGT= Null
- ICM SUFFIX = Null
- XFR SUFFIX = Null
- DIS DGT = Null

Configuring *DHS-L* with a Vodavi Voice Mail System

Complete the following steps to configure the *STARPLUS DHS-L* system:

1. **Set Up Voice Mail Ports**
   a. Connect Single Line Adapter box to system (make note of extension numbers), OR install a SLIB card.
   b. Enter programming mode: [FEAT] + [#] + [✳] + [########] + [save].
   c. Press [show] twice.
   d. Enter the first station number to be used as a VM port, then press [show].
   e. Press [next] until PORT TYPE appears.
   f. Press [chg] to select VM.
   g. Repeat **Steps 1-d thru 1-g** for all stations to be entered as VM ports.
   h. When finished, press [hold] twice.
2. **Assign Station Numbers to UCD Group**
   a. Press [next] until STA APPLICATION appears, then press [show].
   b. When UCD PROGRAMMING appears, press [show].
   c. Enter a [1] on the keypad, then press [show].
   d. When TENANT:1 appears, press [next].
   e. When UCD ATTRIB:UCD appears, press [next].
   f. When UCD GP MEMBER appears, press [show].
   g. When MEMBER 1: appears, press [chg].
   h. Enter VM number (port), then press [save].
   i. Press [next], then repeat **Steps 2-g and 2-h** for all VM ports.
   j. Press [hold] three times to return to STA APPLICATION.

3. Enter Transfer/Intercom Prefixes and Suffixes

a. Press [next] to go to the Voicemail screen.
b. Press [show] until VM HUNT GROUP appears, then press [chg].
c. Enter Group used in **Step 2-c**, then press [save].
d. Press [next] until PREFIX TABLE appears, then press [show].
e. When ICM/VM: appears, press [chg].
f. Press [FEAT + 4] and dial [7], then press [save].
g. Press [next] until TRANSFER appears, then press [chg].
h. Press [FEAT + 4] and dial [7], then press [save].
i. Press [next] until DIRECT FWD appears, then press [chg].
j. Press [FEAT + 4] and dial [7], then press [save].
k. Press [next] until BUSY FWD appears, then press [chg].
l. Press [FEAT + 4] and dial [7], then press [save].
m. Press [next] until NO_ANS FWD appears, then press [chg].
n. Press [FEAT + 4] and dial [7], then press [save].
o. Press [next] until DND FWD appears, then press [chg].
p. Press [FEAT + 4] and dial [7], then press [save].
q. Press [next] until LN RECALL appears, then press [chg].
r. Press [FEAT + 4] and dial [7], then press [save].
s. Press [next] until UCD OVERFLOW appears, then press [chg].
t. Press [FEAT + 4] and dial [7], then press [save].
u. Press [next] until RECORD DGT appears, then press [chg].
v. Press [FEAT + 4] and dial [7], then press [save].
w. Press [next] until ICM SUFFIX appears, then press [chg].
x. Dial ✳, then press [save].
y. Press [next] until DIS DGT appears, then press [chg].
z. Enter #99999, then press [save].

Press [clr] … this completes the Voicemail Integration process.

4 SLT Features and Operation

The System and Single Line Telephone Features of the *STARPLUS® DHS-L™* Systems are listed and described in alphabetical order. Features described here pertain to Single Line Telephones and Analog devices (FAX, modem, cordless phone, etc.) connected to the *DHS-L* via the 2-Port Analog Adapter and 2-Port Analog Expander. An abbreviated feature index is provided; refer to *Table 4-1: SLT Feature Access Codes*.

SLT Feature Code Table

Single Line Telephones can access all of the following feature codes:

Table 4-1: SLT Feature Access Codes

Feature	Code
Alarm Clock Set Cancel	 #92 + hhmm +[1 or 2] #✳92
Call Back Clear	[Ext]# #✳##sss
Call Brokering	[Flash]
Call Forward Busy Cancel Direct (All Calls) DND Forward External Forward Follow To Follow Me Call Forward No Answer	#2 + (Forward type) #21 + [destination] #✳2 + (Forward type) #22 + [destination] #27 + [destination] #26 #25 + [destination] #23 + [destination] + pppp #24 + [destination] + (ring time 01-04)
Call Operator	0
Call Park Answer by CO Line	#73 + (Call Park station number)
Call Pickup Direct Group	 [Ext]6 #54
Camp On	4
CO Line Access Specific Line	9 700-795
Do Not Disturb (Set/Clear)	#4
Flash	Flash
Hold	[Flash]
Hot Line (Ring Down) Cancel	#9✳ [Flash]#✳9✳

Table 4-1: SLT Feature Access Codes

Feature	Code
Intercom Call	201-272, 301-372
Intrusion (Privacy)	[Ext]8
Last Number Redial	#8
Line Flash CO/PBX	[Flash]
Message Waiting Cancel Clear Message Sent Retrieve Send	 #✳96 + sss #✳#9 + sss #96 [Ext]9
Page External—Paging Speakers Meet Me Answer (Meet Me Page) Station Group System All Call	 820 or 821 #59 40 + gg 425
Speed Dial Dialing Storing	 bbb #1 + bbb + n + [Flash]
Station Lock Password Change Unlock	#97 + PPPP + # #97 + PPPP + pppp #97 + PPPP + ✳
Transfer	Flash + sss + hangup
UCD Group (Hunt)	430-453
Voice Mail	#64

bbb = bin number
gg = group number
n = outside phone number
PPPP = current password
pppp = new password
sss = station number

Alarm Clock

Description

An SLT may instruct the system to ring the telephone at a predetermined time for use as a reminder.

Operation

Set

1. Lift handset.
2. Dial [#] + [9] + [2] + [hh] + [mm] + [1 or 2].
   hh = hour in military format
   mm = minute
   [1] = one time
   [2] always

Cancel

1. Lift handset.
2. Dial [#] + [✳] + [9] + [2].

Station Alarm setting is cancelled after each use.

Call Back

Description

When the SLT user calls another system station that is busy he may leave a Call Back request at the station. When the Call Back request is invoked, the SLT station will ring when the busy station goes on hook. Once the SLT answers the Call Back ringing, a new intercom call is placed to the station previously dialed.

Operation

When listening to Busy Tone after dialing a station number or CO line number:

Dial [#].

Clear

To clear a All Call Back request:

1. Lift handset.
2. Dial [#] + [✳] + [#] + [#] + [xxx]
   xxx = Station Number 201-272, 301-372

Call Brokering

Description

Single Line Telephone (SLT) station users may connect to a second party and alternate between connections. This feature is desirable when an SLT user wants to maintain the connection of the parties and at the same time keep them separate from each other.

Operation

While engaged on an intercom or CO line call:

1. Press Hook Flash. The original conversation party is placed on hold.
2. Dial the next station or CO line call.

When the new party answers:

Press Hook Flash to be connected to the first party and place the new call on hold.

Call Forward

Description

The SLT user may forward telephone calls to another station, VM or Hunt Group using 4 call type criteria. The SLT user may also use Follow Me Forward to extend calls at another station to this station.

The user at the forwarded station will hear special Intercom Reminder tone signifying that Call Forward is activated.

Operation

Calls to this station will follow the forward scheme selected.

To setup Call Forward modes:

Lift handset.

Busy

1. Lift handset.
2. Dial [#] +[2] + [1] + [xxx].
   xxx = destination desired

Cancel

1. Lift handset.
2. Dial [#] + [✳] + [2] + (forward type).

Direct (All Call)

1. Lift handset.
2. Dial [#] + [2] + [2] + [xxx].
   xxx = destination desired

DND Forward

1. Lift handset.
2. Dial [#] + [2] + [7] + [xxx].
   xxx = destination desired

External Forward

1. Lift handset.
2. Dial [#] + [2] + [6].

Follow To

1. Lift handset.
2. Dial [#] + [2] + [5] + [xxx].
   xxx = destination desired

Follow Me Call Forward

1. Lift handset.
2. Dial [#] + [2] + [3] + [xxx] + [pppp].
   xxx = destination desired
   pppp = current password

No Answer

1. Lift handset.
2. Dial [#] + [2] + [4] + [xxx] + [t].
   xxx = destination desired
   t = time to ring before forwarding; 0 = 10 secs, 1 = 20 secs, 2 = 30 secs, 3 =40 secs, and 4 =50 secs

Call Operator (Call Attendant)

Description

The system Attendant station may be easily called by one dialed digit code. At default, this code is 0.

Operation

1. Lift handset.
2. Dial [0].

Conditions

- The code dialed for the system attendant (0- 9) is dependent on Database Programming of Operator Code. If 9 is programmed, that is the code that must be used to call the system attendant.
- The Operator access code (0 or 9) is mutually exclusive with the outside CO line access code.

Call Park Answer

Description

SLT users can retrieve calls that have been placed into Call Park status, by dialing the Call Park Answer Feature Code plus the station number or the CO Line number.

Operation

1. Lift handset.
2. Dial [#] + [7] + [3] + [xxx].
   xxx = Call Park station number

Call Pickup

Direct

Description

Ringing calls at unattended stations may be retrieved using the Direct Pickup code.

Operation

1. Lift handset.
2. Dial [xxx] + [6].
   xxx = Station Number 201-272, 301-372

Group

Description

Ringing calls at unattended stations may be retrieved via Group Pickup code, assuming that the station invoking the feature is in the same Station Group as the ringing station.

Operation

1. Lift handset.
2. Dial [#] +[5] +[4].

Camp On

Description

This feature allows you to Camp On a busy CO line and reserve that CO line for use when it becomes available. This feature eliminates the need for you to continually observe the line status for availability. You may only have one Camp On active at any time.

Operation

1. Lift handset.
2. Dial CO or STA #, receive busy tone.
3. Dial [4].

CO Line Access

Description

CO line access is simplified at an SLT by dialing a CO line access code. The code may be 0-9, depending on Database Programming. CO line group access codes are also available. Unused CO ports must be programmed as open.

Operation

To access any idle CO line:

1. Lift handset.
2. Dial [9].

Specific Line

To access a specific CO Line:

1. Lift handset.
2. Dial [ccc].
   ccc = the CO line number/code for the desired CO line number (700-795)

Conditions

- An SLT station may dial access any CO line that has been allowed in database programming.
- The dial codes 0-9 are mutually exclusive. When one or the other is programmed as the Operator Code the remaining is assigned for out dialing at SLT stations.
- The CO line(s) permitted for outgoing selection in any CO line Group, or individually, are dependent on the station programming for CO line access.

Do Not Disturb (DND)

Description

SLT stations may place their telephones in DND mode to avert incoming calls.

Operation

To set DND:

1. Lift handset.
2. Dial [#] + [4].

To clear:

1. Lift handset.
2. Dial [#] + [4].

Calls to a station in DND will hear DND Tone.

Conditions

- Reminder Tone is heard each time the user goes off hook to make calls when DND is active to remind the user of the DND condition.
- When an SLT is in DND mode, DSS button LEDs at other stations will flash, (Refer to *Chapter 3, Key Station Features, Operation, and Programming,* and *"Do Not Disturb (DND)"*.

Flash

Description

This feature allows CO/PBX line users working behind a Centrex or PBX line to generate a hook-flash over that line to access features or transfer calls.

It is recommended that SLT stations installed be equipped with a TAP or FLASH button and the guaranteed disconnect feature. (Many SLT models offer these features.) These features will greatly enhance. If the SLT station user stays on-hook for any time exceeding the END time programmed, the previous call will be disconnected.

Operation

While connected to a CO/PBX line:

Press Flash.

Programming

Single Line Telephone operation requires that the user of a SLT hook flash to invoke call routing features such as Hold and Call Transfer. The *DHS-L* must monitor the timing of a hook flash at a SLT to distinguish a hook flash request from a hang up request.

A hook flash request is typically any depression of the hook switch lasting less than 0.8 sec (800 msec), however users may also use the hook switch to disconnect the current call and request dial tone for a second call.

SLT Hook Flash is divided into two programmable data fields; START and END. The START field entry determines the minimum on-hook duration that will be accepted as a hook flash. The END data field entry determines the maximum on-hook duration that will be accepted as a hook flash.

The system software will always maintain a hook flash time of 100 msec minimum. It is not possible to program a hook flash time that provides no hook flash operation time.

Default

The *DHS-L* START field is set for 300 msec, and the END field is set for 800 msec.

- The programmable range for the START field is:

  100/200/300/400/500/600/700/800/900/1000/1100/1200/1300/1400
- The programmable range for the END field is:

  400/500/600/700/800/900/1000/1100/1200/1300/1400/1500

Hold

Flash

Description

CO line calls and ICM calls may be placed on Hold.

Operation

While connected to a CO Line:

1. Press Hook Flash.
2. After a 2 second delay, dial tone is heard, and the party is placed on hold.
3. Hang up.

While connected to an intercom call:

1. Press Hook Flash.
2. Dial tone is heard, and the party is placed on hold.
3. Hang up.

Conditions

- When an intercom/CO line call is placed on Hold and the holding party hangs up, after the Hold Reminder time is elapsed, the system will ring the hold activating station with internal or external ring signal. If Hold Reminder is disabled, 30 seconds after the call is placed on hold, the system will give the holding party recall ring (internal ring for held ICM call and external ring for held CO Line call). Refer to *Chapter 3, Key Station Features, Operation, and Programming,* and *"Reminder Time"*.
- If Call Abandon is set and properly functioning, calls placed on hold will be released if the outside party disconnects.
- To answer Hold Recall at an SLT, lift the handset (refer to *Chapter 3, Key Station Features, Operation, and Programming,* and *"Transfer").*
- This feature may need to be adjusted on some telephones for proper operation.

Hot Line (Ring Down)

Description

This feature allows you to use the associated single line telephone (SLT) port for automatic signaling to a predetermined destination. You can set up the Hot Line feature to call another station or speed dial bin number.

Operation

1. Lift the handset.
2. Dial [#] + [9] + [✳].

3. Enter desired destination.
4. Dial the delay time (0-9) seconds.
   (0 = immediate, 1-9 = delay in seconds)

Cancel

1. Press Hook Flash.
2. Dial [#] + [✳] + [9] + [✳].

Operation

1. Go off-hook.
2. Wait for the delay time to expire.

Intercom Call

Description

The SLT user can make Intercom Calls by going off-hook (intercom dial tone) and dialing the Intercom Station Number of the desired station.

Operation

1. Lift handset.
2. Dial the desired station, Hunt Group or VM Group number.

Intrusion (Privacy)

Description

Factory default settings provide privacy for all intercom and CO line calls. These calls may not be monitored or interrupted by other stations.

Operation

1. Lift handset.
2. Dial busy extension number.
3. Press [8].

Last Number Redial (LNR)

Description

The Last Number Redial (LNR) feature automatically dials the last number dialed from that telephone. A maximum of 16 digits can be stored in the LNR buffer for every station.

Operation

1. Lift handset.
2. Dial [#] + [8].

Message Waiting

Description

The user is able to send messages to a station and return messages left at their station by dialing a feature code.

When there is a message waiting, the user will hear special Intercom Reminder tone signifying that there is a message.

Operation

Cancel

1. Lift the handset.
2. Dial [#] + [✳] + [9] + [6].

Clear Message Sent

1. Lift the handset.
2. Dial [#] + [✳] + [#] + [9] + [sss].
   sss = Station number (201-272, 301-372) where message was left

Retrieve

1. Lift the handset.
2. Dial [#] + [9] + [6].

Send

1. Lift the handset.
2. Dial [sss] + [9].
   sss = Station number (201-272, 301-372) where message is to be left

Page

SLT stations can access through the use of feature codes (Internal, External, and All Call Paging services) on the *DHS-L* Systems.

External (Paging Speakers)

1. Lift the handset.
2. Dial [820 or 821].

Meet Me Answer (Meet Me Page)

Any user hearing an Internal or External Page can answer the Page by dialing the Meet Me Page feature code.

When a page announcement is heard:

1. Lift the handset.
2. Dial [#] + [5] + [9].

Station Group

1. Dial [4].
2. Dial Group Number (01-24).)

System All Call

1. Lift the handset.
2. Dial [425].

Tenant Paging (All Groups)

1. Lift the handset.
2. Dial [400].

Port Numbering

Description

Adding SLT stations to the *DHS-L* has the significant advantage of port-gain. When the SLT interfaces are installed (2-Port Analog Adapter and 2-Port SLT Expansion), the station numbering and available station ports are expanded at a ratio of 2-to-1.

When analog adapters and expansions are installed, the port numbering is as follows:

Table 4-2: Default Station Directory Numbers

Card Type				Slot Number								
Port	B	DST1 AST1	DST2 AST2	4	5	6	7	8	9	10	11	12
1	B1	X	X	201	209	217	225	233	241	249	257	265
2	B1	X	X	202	210	218	226	234	242	250	258	266
3	B1	X	X	203	211	219	227	235	243	251	259	267
4	B1	X	X	204	212	220	228	236	244	252	260	268
5	B1	X	X	205	213	221	229	237	245	253	261	269
6	B1	X	X	206	214	222	230	238	246	254	262	270
7	B1	X	X	207	215	223	231	239	247	255	263	271
8	B1	X	X	208	216	224	232	240	248	256	264	272
9	B2		X	301	309	317	325	333	341	349	357	365
10	B2		X	302	310	318	326	334	342	350	358	366
11	B2		X	303	311	319	327	335	343	351	359	367
12	B2		X	304	312	320	328	336	344	352	360	368
13	B2		X	305	313	321	329	337	345	353	361	369
14	B2		X	306	314	322	330	338	346	354	362	370
15	B2		X	307	315	323	331	339	347	355	363	371
16	B2		X	308	316	324	332	340	348	356	364	372

2-Port Analog Adapter

Description

A 2-Port Analog Adapter is provided for connection of standard 2-wire analog telephone equipment to the digital network of the *DHS-L*. Common uses of the 2-Port Analog Adapter are voice mail, facsimile machines, modems, and single line analog telephones.

The 2-Port Analog Adapter is a self-contained, system-powered apparatus that creates 2 separate analog station ports from one system 2B+D digital key telephone port. The housing accommodates the electrical components of the 2-Port Analog Adapter and the 2-Port Analog Expansion. The 2-Port Analog Expansion PCB is exactly the same PCB and function as the 2-Port Analog Adapter PCB function. (One 2-Port Analog Expansion may be added to the 2-Port Analog Adapter housing.)

When used with the DTIB-8, the 2-Port Analog Adapter and 2-Port Analog Expansion each provide 2 dedicated DTMF receivers for decoding the dialed digits from the connected device. (Each analog port has a dedicated DTMF receiver.) To place calls, the analog telephone must provide DTMF tone signaling which is decoded by the adapter for call processing instructions. Twenty-five cycle (frequency) ringing is provided by each analog adapter for the attached analog device. Since each 2-port adapter provides dedicated DTMF receivers and ringing generators, and because the system has a non-blocking digital ICM bus, the single line telephones (SLT) are not traffic sensitive and do not require special traffic balancing.

Directory Numbers are changed in system programming.

DTIB-8 (2 to1)

Conditions

- Any single line (2500 type) telephone equipment can be connected to the system using the 2-Port Analog Adapter and 2-Port Analog Expansion.
- Directory Numbers are assigned to B2 channels for SLT use at default.
- When 2-port analog adapter is installed, the first single line extension number from that adapter is the same as the digital port extension number into which it is plugged. The second analog extension number is the first number plus 100 (example: 201 and 301, 202 and 302).
- Some modems are not compatible with 2-port analog adapters.

Speed Dialing (ABBR)

Speed Dialing (SPD) allows SLT users to store frequently dialed numbers. These numbers can easily be selected by dialing the Features Access Code plus the Bin Number desired. Each station can store up to 50 Station SPD Numbers in memory Bins (500-549). Each SPD Bin may contain up to sixteen (16) digits.

Dialing

1. Lift handset
2. Dial SPD bin number.
   Individual (station) numbers = 500-549, Common (system) numbers = 600-699

Storing

1. Lift handset.
2. Dial [#] + [1].
3. Dial SPD bin for programming. Station Speed Dial bins range from (500-549).
4. Enter the desired outside phone number.

5. Press Hook Flash, and a confirmation Tone is heard.

Use of System speed dial numbers is based on the SLT Class of Service assignment. When speed dialing, either private speed dial number or system speed dial number is allowed.

Station Lock

Description

The Station Lock/Unlock feature is used to prevent unauthorized outside calling from a station that is unattended. The feature code [#97] is also used to program the station's private 4-digit password.

Use of the Station Lock feature 97 will restrict access to 911.

Operation

To lock station:

1. Lift handset.
2. Dial [#] + [9] + [7] + [PPPP] + [#].
   PPPP = current password

Password Change

1. Lift handset.
2. Dial [#] + [9] + [7] + [PPPP] + [pppp].
   PPPP = current password
   pppp = new password

Unlock

1. Lift handset.
2. Dial [#] + [9] + [7] + [PPPP] + [✳].
   PPPP = current password

Transfer

Description

Transfer a call from your station to another station while connected to current call.

Operation

While on a CO Line call:

1. Press Hook Flash.
2. Dial Station number within 5 seconds (call will be disconnected after 5 seconds have elapsed if station number is not entered).
3. Hang up to complete the transfer.

While on an intercom call:

1. Press Hook Flash.
2. Dial Station number.
3. Hang up to complete the transfer.

Conditions

- When a CO line call is transferred, the system rings the new station with external ring signal.
- When transferring a call, the held internal party becomes the new calling party and hears Ring Back tone.
- CO Line Call Transfer is allowed for idle or busy transfers.
- An SLT cannot transfer a CO line call to a station that is in DND mode.

UCD Group (Hunt)

Station

Description

Up to 24 hunt groups may be assigned. Each Hunt Group can contain up to 24 members. Hunt Group directory numbers are (430-453). One Hunt Group may be assigned as a Voice Mail type Hunt Group for system voice mail integrated operation.

Operation

1. Lift handset.
2. Dial Hunt group number (430-453).

Voice Mail

Description

You may forward calls to the Voice Mail system using Call Forward and the Voice Mail Hunt Group number. Calls that you forward to Voice Mail will be forwarded to your mailbox. The person calling will hear your greeting and be prompted to leave a message. Once a message is left, the Voice Mail system will light the Voice Mail button.

Operation

To retrieve voice mail messages:

Press [#] + [6] + [4].

Port

Single Line Telephone ports that are to be used for connection to a Voice Mail system must be assigned type VM to provide longer DTMF tones. This identifies the port to the system software for special handling.

Default

DHS-L Single Line Telephone ports are set to N (NO), not assigned as a VM port.

5 HOTEL/MOTEL -- Operator Features

The information necessary for the Operator to program and operate the Hotel/Motel features in the *STARPLUS® DHS-L™* system is addressed in this chapter.

Configurations

These Operator/Attendant features are also available for single line telephones programmed with Hotel/Motel configurations.

911 Emergency Service - User Dialed

Description

When a room occupant or employee dials for emergency service (911), the operator/attendant console will be notified and an SMDR record will be generated.

When Forced LCR is enabled for GUEST stations, a GUEST can place an emergency call by dialing 911 instead of first dialing a [9] to access an outside CO line.

Programming

When a room user dials the CO access code and dials for emergency service (911), the call will be dialed. But for emergencies, the user may dial 911 directly without dialing the CO access code, this call 911 must be dialed as well.

To make this possible, Forced LCR for Guest type stations is automatically enabled, and the LCR table must be programmed for dealing with the 11 digits, and the digit 9 will be inserted for the prefix code.

The system must be programmed either LCR code length to 1 and the leading to 9 or Trunk Route length to be 1 and the leading to be 9. Otherwise, the system will not dial out emergency call by pressing 911 directly without CO access code.

This Feature will only be functional when HOTEL (in Call Handling) is enabled.

Table Examples: The following tables show the coding needed for SLT operation.

```
                                                Date: MM/DD/YY
                                                Time: HH/MM/SS
LCR- Digit Comparison Table Programming: Tenant1- (01/30)

No.  From   To     SUN   MON   TUES  WED   THR   FRI   SAT
001  00     10     1     1     1     1     1     1     1
002  12     99     1     1     1     1     1     1     1
003  11     11     2     2     2     2     2     2     2
004  NONE   NONE   - -   - -   - -   - -   - -   - -   - -
005  NONE   NONE   - -   - -   - -   - -   - -   - -   - -
006  NONE   NONE   - -   - -   - -   - -   - -   - -   - -
007  NONE   NONE   - -   - -   - -   - -   - -   - -   - -
008  NONE   NONE   - -   - -   - -   - -   - -   - -   - -
009  NONE   NONE   - -   - -   - -   - -   - -   - -   - -
010  NONE   NONE   - -   - -   - -   - -   - -   - -   - -

Note: From/To: (NONE/0-9, #, *,X)    Time of Week : (NONE/1-10)
```

```
                                                          Date: MM/DD/YY
                                                          Time: HH/MM/SS
Least Cost Routing- Time of Day Table Programming : Tenant1- (01/1)

No. Time1 Time2 Time3 Time4 Time5 Time6 Rte1 Rte2 Rte3 Rte4 Rte5 Rte6
01  00:00 - -   - -   - -   - -   - -   01   - -   - -   - -   - -
02  00:00 - -   - -   - -   - -   - -   02   - -   - -   - -   - -
03  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -
04  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -
05  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -
06  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -
07  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -
08  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -
09  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -
10  - -   - -   - -   - -   - -   - -   - -  - -   - -   - -   - -

Note: From/To: (NONE/0-9, #, *,X)    Time of Week : (NONE/1-10)
```

```
                                                  Date: MM/DD/YY
                                                  Time: HH/MM/SS
Least Cost Routing- Route Table : Tenant1- (01/3)

                DMT             DMT             DMT             DMT
No.   Choice1   No.   Choice2   No.   Choice3   No.   Choice4   No.
01    1         1     - -       - -   - -       - -   - -       - -
02    1         2     - -       - -   - -       - -   - -       - -
03    - -       - -   - -       - -   - -       - -   - -       - -
04    - -       - -   - -       - -   - -       - -   - -       - -
05    - -       - -   - -       - -   - -       - -   - -       - -
06    - -       - -   - -       - -   - -       - -   - -       - -
07    - -       - -   - -       - -   - -       - -   - -       - -
08    - -       - -   - -       - -   - -       - -   - -       - -
09    - -       - -   - -       - -   - -       - -   - -       - -
10    - -       - -   - -       - -   - -       - -   - -       - -

Note: Choice: (NONE/1-24, DMT NO. : (NONE/1-24)
```

```
                                                Date: MM/DD/YY
                                                Time: HH/MM/SS
Least Cost Routing- DGT Modification Table : Tenant1- (01/3)

        Delete   Prefix            Insert             Insert
No.     Digit    Digits            Digits             Position
01      - -      NONE              NONE               - -
02      - -      9                 NONE               - -
03      - -      NONE              NONE               - -
04      - -      NONE              NONE               - -
05      - -      NONE              NONE               - -
06      - -      NONE              NONE               - -
07      - -      NONE              NONE               - -
08      - -      NONE              NONE               - -

Note: Del.DGT: (NONE/1-12). Prefix DGTs/Insert DGTs: (0-9, *, #, P,
W)
       Insert Position: (NONE/ 1-19)
```

```
                                                Date: MM/DD/YY
                                                Time: HH/MM/SS
Station Application: Voice Mail Table

VM Hunt Group: 0                                (0, 1, 2 , . . ,24)

Prefix Table:       ICM/VM Button   --> NULL    (4 digits maximum)
                    Transfer        --> NULL    (4 digits maximum)
                    Busy Forward    --> NULL    (4 digits maximum)
                    No_Ans Forward  --> NULL    (4 digits maximum)
                    DND Forward     --> NULL    (4 digits maximum)
                    Trunk Recall    --> NULL    (4 digits maximum)
                    Trunk Greeting  --> NULL    (4 digits maximum)
                    UCD Overflow    --> NULL    (4 digits maximum)
                    Record Digits   --> NULL    (4 digits maximum)
                    Clear VM Msg    --> NULL    (4 digits maximum)

Suffix Digit:                       --> NULL    (2 digits maximum)

Disconnect Digit:                   --> NULL    (8 digits maximum)

Note: DTMF 0 ,1 ,2 ,3 ,4 ,5 ,6 ,7 ,8 ,9 ,* ,# , and Pause (P)
```

Operation

When a user dials 911 for emergency service:

- The Operator/Attendant is notified and an SMDR record is created.
- The Operator/Attendant receives a continuous alert, the display shows the following:

```
EMERGENCY    201
ack
```

- The alert will stop in 3 minutes, unless [ack] is pressed before that time.
- The DSS/BLF key remains red until the station or CO line returns to idle.
- The SMDR record will be generated when the call is initiated (not when completed). After the call is completed, the system will not generate another SMDR record.

Multiple Wake-Up Calls

Description

The Operator/Attendant is allowed to program all stations for multiple wake-up calls (reminders).

Operation

The Operator/Attendant programs a station reminder as follows:

1. Press [FEAT] + [9] + [2]. The display shows:

```
STATION : ___
bksp show chg
```

2. Enter desired station number and press [show]. The display shows:

```
REMINDER : NULL
bksp show chg
```

3. Press [chg] and enter the specified time in HH:MM format. The display shows:.

```
REMINDER : HH:MM
bksp show chg
```

4. Press [save]. The display shows:

```
REMINDER : HH:MM
one always
```

5. Press [one] and the Station display returns. Enter another station number if desired.

```
STATION : ___
bksp show chg
```

When in GUEST mode, the station is programmed as follows:

1. Press [FEAT] + [9] + [2]. The display shows:

```
REMINDER : NULL
bksp save chg
```

2. Press [chg]. The display shows:

```
REMINDER : __:__
bksp save chg
```

3. Enter the desired time in HH/MM format and press [save]. The display shows:

```
REMINDER : 06:30
one always
```

4. Press [one]. The display returns to an idle mode and shows the current date and time.

```
JAN 8 WED : 12:12
STA D-1 202
```

(The **always** option is disabled when a telephone is in GUEST mode. This function can only be programmed at the Attendant station.)

Room Status

Description

The Operator/Attendant can monitor the following GUEST room status conditions: Check In, Check Out, Ready, Maintenance, Unavailable.

Programming

The room status lamp is indicated when a station is idle and DND is disabled. For this feature to operate, HOTEL must be enabled. Only the Tenant Attendant can access this function (except Maid Clean Code).

Operation

Check In

1. Press [FEAT] + [7] + [#] + [2]. The display shows:

```
CHECK IN : _
bksp save chg
```

2. Enter the desired station number and press [save].

   If the station directory number is valid, all the DSS/BLF of that station will become green-lit, the COS of that station will follow the Station COS (Day/Night) in the Database and the Room Status will be Check-in.

Also, one beep will be provided and the LCD will stay for 3 seconds before going back to normal operation.

```
CHECK IN  :
301
```

Check Out

1. Press [FEAT] + [7] + [#] + [3]. The display shows:

```
CHECK OUT  : _
bksp  save  chg
```

2. Enter the desired station number and press [save].

   If the station directory number is valid, all the DSS/BLF of that station will be green slow flash, the COS of that station will be reduced to 7 and the Room Status will be Check-out. Also, one beep will be provided and the LCD will stay for 3 seconds before going back to normal operation.

```
CHECK OUT  :
301
```

Room Ready

When the Station Type database is sent from RMP to KSU, if the Station Type for particular stations is GUEST and those stations are not in Check-in, Check-out, Maintenance, or Unavailable room status, all the DSS/BLF of those stations will be dark, the COS of those stations will be 7 and the Room Status will be Room Ready.

1. Press [FEAT] + [7] + [#] + [1]. The display shows

```
ROOM READY  : _
bksp  save  chg
```

2. Enter the Station Directory number + [save].

   A double beep is heard when:

   - Station number entered is unavailable.
   - Station Type does not = GUEST.
   - The tenant of the station is not the same as the Tenant Attendant operating this function.
   - The station is not at Check-out, Maintenance, or Unavailable Room Status.

   Maid Clean Code

   When the Room Status of a station is Check-out, it can be changed to Room Ready by pressing the access code [FEAT] + [7] + [#] + [1] at that station. When the Room Status is changed successfully, a beep will be provided for Digital Keyset or a confirmation

tone will be provided for the SLT. If the Station is equipped with an LCD, a message will be displayed for 3 seconds.

```
ROOM READY : 301
```

Maintenance

1. Press [FEAT] + [7] + [#] + [4]. The display shows:

```
MAINTENANCE : _
bksp save chg
```

2. Enter the Station Directory number + [save].

   A double beep is heard when:

   - Station number entered is unavailable.
   - Station Type does not = GUEST.
   - The tenant of the station is not the same as the Tenant Attendant operating this function.

Unavailable

1. Press [FEAT] + [7] + [#] + [5]. The display shows:

```
UNAVAILABLE : _
bksp save chg
```

2. Enter the Station Directory number + [save].

   A double beep is heard when:

   - Station number entered is unavailable.
   - The Station Type does not = GUEST.
   - The tenant of the station is not the same as the Tenant Attendant operating this function.

   Any Room Status can be changed to Unavailable. If the station directory number is valid, all the DSS/BLF of that station will be red-lit, the COS of that stations will be reduced to 7 and the Room Status will be unavailable. If the Station is equipped with an LCD, a message will be displayed for 3 seconds. Also, one beep will be provided and the LCD will stay for 3 seconds before going back to normal operation.

```
UNAVAILABLE : 301
```

Voice MailBox (Clear Messages)

Description

The Operator/Attendant activates this feature and can clear messages in any designated voice mailbox.

Database Programming

Enter programming mode and press [show].:

```
VOICE MAIL
back  next  show
```

Press [show]. The display shows:

```
VM HUNT GROUP  :  0
back  next  show
```

Enter hunt group number (0-24). The display shows:

```
PREFIX TABLE
back  next  show
```

Press [show]. The display shows:

```
ICM/VM  :  _
back  next  show
```

Press [next]. The display shows:

```
TRANSFER  :  _
back  next  show
```

Press [next]. The display shows:

```
BUSY DIV.  :  _
back  next  show
```

Press [next]. The display shows:

```
NO_ANS DIV.  :  _
back  next  show
```

Press [next]. The display shows:

```
DND DIV.  :  _
back  next  show
```

Press [next]. The display shows:

```
CLEAR VM MSG
back  next  show
```

Press [next]. The display shows:

```
SUFFIX DGT  :  _
back  next  show
```

Press [next]. The display shows:

```
DISC. DGT  :  _
back  next  show
```

Press HOLD. The display shows:

```
VOICE MAIL
back  next  show
```

Operation

To access a voice mailbox:

Press [FEAT] + [5] + [3] + station number.

Feature Access Codes

Description

The Operator/Attendant can activate or deactivate specific feature codes for any station designated as a GUEST.

Operation

Individual and Common ABBR (Speed Dialing), Paging, and most of the feature access codes will not be allowed when the station type is GUEST.

When HOTEL is enabled, only the following feature codes can be accessed by GUEST station:

Table 5-1: Feature Access Codes (Guest)

Feature	Access Code
Call Forward	FEAT + 2 + (access code 1-7)
Call Forward - Cancel	FEAT + *2 + (access code 1-7)
Do Not Disturb (enable/disable)	FEAT + 4
Maid Clean Code	FEAT + 7#1
Maintenance	FEAT + 7#4 + (station number)
Message Waiting Reply	FEAT + 96
Voice Message Waiting Reply	FEAT + 64

Station Type

Description

Station Type is used to allow/disallow specific functions to stations designated as GUEST or STAFF.

Default

Station Type = STAFF

Database Programming

Entering programming mode:

```
1. STATION
back  next  show
```

Press [show] and enter desired station number. The display shows:

```
SHOW STA  :  201
bksp  show  chg
```

Press [show]. The display shows:

```
POSITION  :  1-01-01
back  next
```

Press [next]. The display shows:

```
TENANT GROUP  :  1
back  next  chg
```

Press [next]. The display shows:

```
STA TYPE  : STAFF
back  next  chg
```

Press [chg]. The display shows:

```
STA TYPE  : GUEST
back  next  chg
```

```
                                                    Date: MM/DD/YY
                                                    Time: HH/MM/SS
Station - Category1: (01/12)
                        Day    Night  Tenant  Pickup  Paging  Station
No.   DIR#  M/SS/PP      Class  Class  Group   Group   Group   Type
001   201   1/04/01  B1  0      0      0       1       1       STAFF
002   202   1/04/01  B1  0      0      0       1       1       STAFF
003   203   1/04/01  B1  0      0      0       1       1       STAFF
004   204   1/04/01  B1  0      0      0       1       1       STAFF
005   205   1/04/01  B1  0      0      0       1       1       STAFF
006   206   1/04/01  B1  0      0      0       1       1       STAFF
007   207   1/04/01  B1  0      0      0       1       1       STAFF
008   208   1/04/01  B1  0      0      0       1       1       STAFF
009   209   1/04/01  B1  0      0      0       1       1       STAFF
010   210   1/04/01  B1  0      0      0       1       1       STAFF
011   211   1/04/01  B1  0      0      0       1       1       STAFF
012   212   1/04/01  B1  0      0      0       1       1       STAFF

Note: Day Class: (0-7 Night Class: (0-7)
      Tenant Group: (1-6) Pickup Group: (1-24) Paging Group: (1-24)
      Station Type: (STAFF, GUEST)
```

6 Maintenance/ Troubleshooting

The *STARPLUS® DHS-L™* troubleshooting procedure is a logical approach to fault identification, analysis, and correction. The key system may generate symptoms of problems that actually occur outside of the office environment.

System Maintenance

General Information

Maintaining the *DHS-L* digital telephone system is a combination of customer database changes, facilities and apparatus moves, adds and changes. These requirements are handled properly by practicing the techniques, illustrations and step-by-step instructions listed in the previous sections of this manual.

Cleaning

When installed properly the *DHS-L* performs relatively maintenance-free. From time to time the digital telephone instruments may become dirty or dusty and require cleaning. We suggest the use of a clean, dry cotton (or other soft, absorbent) cloth to wipe the instrument clean. Use of chemicals to clean the telephone plastics is NOT recommended since some chemicals can cause permanent damage to the telephone finish. If deep soiling conditions exist for the telephone to be cleaned, use of specialized telephony cleaning solutions may give satisfactory results. When trying any cleaner for the first time we suggest that it be applied to the telephone instrument underside in a small sample area to assure that the desired results are obtained before proceeding.

Failures

Problems such as system restarts (from temporary AC power interruption), fading (from the long distance carrier), or dropped calls (caused by internal user randomly pressing holding CO Line buttons) all are common situations that are not the result of a system component or software failure.

The System Troubleshooting section attempts to provide the service technician with some quick, and reliable, tools to diagnose installation related or service related problem reports.

KSU

Component failures at the KSU are limited to power distribution (fuses), improper or shorted wiring, CO or station interface failure, or auxiliary circuit problems.

Power/CPU LED

The power supply, PSU, AC switch will light red when AC power is present and the AC switch is on. The power supply CD LED will be lit when DC power is on.

The MPB heartbeat LED is located at the top of the MPB module. When the CPU is running and is not locked up or failed, the LED will be flashing at a rapid rate. The initialization switch is located inside the MPB module just below the battery and must be set to ON before powering up the system.

System Diagnostics

Table 6-1: Central Processor Unit (CPU)

Symptom	Diagnostic Aid	Cause	Corrective Action
No system operation LCD telephones have no display No LED's lit at any telephones	Power Supply LED Heartbeat/LED not flashing	No AC input	Check commercial AC outlet.
		KSU Power Cord	Verify that both ends of AC cord are plugged in.
		Power On Switch	Switch the KSU AC power switch to the ON position.
		AC Fuse	Inspect and replace PS exterior AC input fuse.
		DC Fuse	Inspect and replace PS DC output fuse.
No system operation LCD telephones may have data frozen on displays No LED's lit at any telephones or intermittent CPU is locked up	CPU Heartbeat/LED not flashing	Initialization Switch	1. Verify initialization switch is in ON position. □ Power down, remove MPB Module, and install MPB. □ If the Initialization switch is not in the ON position when the KSU is powered, the Power Up Initialization sequence at the end of *Chapters 2 & 3* should be followed. □ If the system was properly initialized, proceed to Step 2. 2. Power up and observe system recovery. *(The system power should remain off for a least 5 seconds for this test).* If no heartbeat is seen proceed to Step 3. 3. Power down, detach all station cabling, and power up. *(The system power should remain off for a least 5 seconds for this test).* If no heartbeat is seen proceed to step 4. 4. Power down, inspect for the following: □ Loose or unplugged Modules or cables. □ Improperly aligned ribbon cables. □ Improper installation of the system software EPROM, located in socket U9 CPU Module.
 EMERGENCY ACTION Since the unique battery protected customer database will be erased and the system will boot up with default programming.			1. Move initialization switch to the OFF position. 2. Return initialization switch to the ON position. 3. IF CPU/LED is still not flashing, replace MPB. 4. Initialize and test according to the Power Up Initialization sequence.

Table 6-2: Key Telephone / SLT Telephones Dead

Symptom	Diagnostic Aid	Cause	Corrective Action
Telephones/station apparatus dead.	MPB Heartbeat / LED Lit	Shorted Station Pair(s)	1. At MDF, remove cross connect (jumper) wires at the punch-down (66M1-50) block going to all affected stations. 2. Reconnect stations one by one verifying that each power up correctly.
	Key Telephone	Bad Key Telephone	When one is found that will not power up: 1. Disconnect the telephone at the user location. 2. Replace with a *known working* telephone. ☐ If the new station power up is normal, replace the first connected key telephone. ☐ If the new station also does not power up, follow the remaining steps for the individual station. ☐ If none power up; remove all cross connect wiring that run between the Module 66 block and the station cable 66 block. 3. Connect one station directly to the Module 66 block station pair.
		Shorted station cable	If the key telephone power up is normal: inspect, repair or replace the station cable.
		Shorted KSU-MDF cable	If the key telephone does not power up: inspect, repair or replace the cable from the Module to the MDF. Once the cable from the Module to the MDF is inspected, repaired or replaced; connect the *known working* telephone directly to the Module 66 block station pair.
	*The key telephones use only one twisted cable pair for power, data control and voice communications. There are no fuses for station interface protection. Instead, a current sensing poly-switch limits excessive current going to each station. If a station cable pair is shorted or a telephone's DC power supply is damaged, the poly-switch will temporarily open to protect the Module circuitry.*		

Table 6-3: Erratic Key Telephone Operation

Symptom	Diagnostic Aid	Cause	Corrective Action
Erratic operation: LCD Display and LEDs Faint data noise during background conversation	Digital Volt/OHM meter	Cable distance is too long for gauge of cable used. Non-standard telephone cable being used or multiple digital stations fed from one common cable.	If a key telephone is not receiving clear 2B+D signal from KSU, test as follows: ☐ Test cable with a known good keyset. ☐ Check wiring, cables, and connectors. ☐ Replace card. ☐ Check AC voltage.

Table 6-4: Key Telephone (cannot be heard)

Symptom	Diagnostic Aid	Cause	Corrective Action
Other party cannot hear you. (handset)	Key Telephone (other station)	Component failure	1. Verify MUTE Btn LED is not lit. 2. Lift handset, dial another station. Talk. 3. Replace handset assembly and repeat Step 1. 4. Replace handset cord and repeat Step 1. 5. If still no transmit, the key telephone will need to be replaced.

Table 6-5: Key Telephone (cannot hear)

Symptom	Diagnostic Aid	Cause	Corrective Action
Cannot hear (handset)	Key Telephone	Component Failure	1. Verify MUTE is not lit. 2. Lift handset, ICM tone should be heard over the handset. 3. Press [SPKR] key, observe red LED and place handset on hook. ☐ If ICM tone is heard over the loudspeaker, but was not heard through the handset in Step 1, exchange handset assembly with another known working unit. ☐ If ICM tone is still not heard after repeating the test in Step 1, replace the coiled handset cord. If the cord is defective, the original handset is probably okay. ☐ If ICM dial tone still cannot be heard, replace key telephone.

Table 6-6: Speakerphone (cannot be heard)

Symptom	Diagnostic Aid	Cause	Corrective Action
Other party cannot hear you on your speaker phone	Key telephone (other station)	Connections, component failures	1. Verify MUTE is not lit. 2. Press [SPKR] and listen for tone over the speaker. 3. Call a known good working station. *(The distant party should be using the handset).* 4. If the other party cannot hear you, lift handset and verify proper handset operation.

Table 6-7: No Sound From Speaker

Symptom	Diagnostic Aid	Cause	Corrective Action
No sound over speaker	Key telephone	Connections, component failure	1. Press [SPKR] button (red LED). 2. If you can hear ICM tone over the handset, but not the speaker, replace the key telephone.

Table 6-8: Static/Noise During Conversation

Symptom	Diagnostic Aid	Cause	Corrective Action
Static and/or noise can be heard during a conversation	Logic of elimination		If you can hear the static, is it on intercom handset to handset calls? If yes, do you hear the static when you call any other ICM stations? *(The problem may be the telephone called or calling you).*
		Station cable wiring	If static on ICM and CO line calls, verify wall jack connection and MDF connections. Correct any problems found.
		Bad component	If noise persists, replace handset cord.
		Telco problem	☐ If static only on outside CO calls, do other stations hear similar static noise? ☐ If other stations hear static, is it only on one CO line? Which one? ☐ If on several CO lines, the Telco may have a wet cable. Disconnect the CO line from the KSU, and using a dial test handset (buttset), place a call and listen for static. If noise is present, contact the Telco.
		KSU-MDF wiring	If noise is present only when the KSU is connected to the CO lines, inspect, repair or replace the CO line feeder cables that plug into the KSU interface board.
		Possible module problem	☐ If noise is still present on a certain CO line, and CO incoming line cord has been exchanged, move this cord (CO line) to another KSU line position. If noise is now removed on the new CO line interface, something is bad with the KSU input jack. ☐ Call Customer Service.

Table 6-9: CO Line Problems

Symptom	Diagnostic Aid	Cause	Corrective Action
Lines on Hold, no one there.	System Programming		If the customer complains of seeing many holding lines, and when accessed no one is on the other end, calls may be left in an abandoned state.
		Outside caller abandons call	If the serving Central Office (Telco) provides disconnect supervision: ☐ The KSU should be programmed (on a per CO line basis) to recognize an abandoned call (default). ☐ When the outside holding party hangs up, the CO line interface detects change in CO voltage for the associated line. ☐ The KSU then removes the inside Hold indication at all telephones and restores the line to idle.
		User error	Auto Hold Allow may be enabled at a station that is unsure of the proper operation of this feature. ☐ If so, insure that inside users do not accidentally place calls on Hold while skipping from one CO line to another, refer to the Key telephone User Guide. ☐ By programming Auto Hold Deny (code F94) at the abusing stations, incoming CO lines will not be accidentally placed on Hold.

Table 6-10: Lines Stay Busy

Symptom	Diagnostic Aid	Cause	Corrective Action
Lines sometimes show busy even though no one else is in the office, or no one is using the line.	System Programming	Customer confusion or Programming error	Verify CO line programming for DISA, External Call Forwarding, and Day/Night Service. (The system will hold up certain trunk-to-trunk calls until a forced disconnect interval time is reached.)

Table 6-11: Btn Programming is Lost/Changed at Key Telephone

Symptom	Diagnostic Aid	Cause	Corrective Action
Previously programmed feature buttons now do not work or have different features assigned.	Executive Key Telephone Display	Unauthorized customer reprogramming	1. See if customer has a User Guide and understands feature button programming. 2. Compare the current system database and station feature button programming with the completed programming worksheets. Feature button program memory is retained at the KSU. The memory is protected by a Ni-Cad or Nickel Metal Hydride battery. □ If system power is removed for longer than seven (7) days, all system database programming may be lost and default database is loaded. □ Loss of power will also affect other customer unique system programming along with all other key telephones feature button programming.

A Database Programming Forms

Use the following forms to complete the customer specific programming applications prior to actual system programming. For several database fields some forms do not provide an entry area for all possible programming, since the majority of installation applications will not require changes to all data in all program fields.

Programming Work Sheets

You may photocopy these forms to use as actual programming work sheets.

Table A-1: System Application Numbering Plan

DATA PARAMETER	RANGE	CUSTOMER DATA
Station	201-272 301-372	
CO Line	700-795	
CO Line Group	1-24	
Hunt Group	430-453	

Table A-2: CO Line Data

DATA FIELD	RANGE	CO Line Numbers																DEFAULT
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
		700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	
Dialing Type	Tone/Pulse																	Tone
Call Abandon	Y/N																	N
CO Line Type	CO/PBX/ Open/Empty																	CO
Loud Bell	Y/N																	N
CO Line Group	1-24																	1
Private To	201-272 301-372																	Empty
Toll Override	Y/N																	N
Distinct Tone	1/2/3/4																	
ICLID Port	1-96																	

Table A-3: Station Data

DATA FIELD	RANGE			STATION NUMBERS								DEFAULT
				201/ 301	202/ 302	203/ 303	204/ 304	205/ 305	206/ 306	207/ 307	208/ 308	
Day COS			0-7									0
Night COS			0-7									0
CO Line Assignment	Port 1	Tenant 1	Y/N									Y
	2	1	Y/N									Y
	3	1	Y/N									Y
	4	1	Y/N									Y
	5	1	Y/N									Y
	6	1	Y/N									Y
	7	1	Y/N									Y
	8	1	Y/N									Y
CO Line Receive Assignment	Port 1	Tenant 1	Y/N									Y
	2	1	Y/N									Y
	3	1	Y/N									Y
	4	1	Y/N									Y
	5	1	Y/N									Y
	6	1	Y/N									Y
	7	1	Y/N									Y
	8	1	Y/N									Y

Table A-3: TRUNKS Data

DATA FIELD	RANGE			STATION NUMBERS								DEFAULT
				201/ 301	202/ 302	203/ 303	204/ 304	205/ 305	206/ 306	207/ 307	208/ 308	
CO Line Ring Assignment	700		day/ night/ both/ none									Station - 100 Both
	701											
	702											
	703											
	704											
	705											
	706											
	707											
	708											
	709											
	710											
	711											
	712											
	713											
	714											
	715											
	716											
	717											
Account Code Forced			Y/N									N
Station Group			(1-24)									1
Warning Tone			Y/N									N
Drop Time-out			Y/N									N
Station Position			201-272 301-372									(201-272 301-372)
VM Port			Y/N									N
DSS Owner			201-272 301-372									(none)

Table A-1: Call Handling Data

DATA PARAMETER	FORMAT	CUSTOMER DATA	DEFAULT
Intrusion (Privacy) Release	Y/N		N
Intrusion (Privacy) Tone	Y/N		Y
Exclusive Hold Time	0-8 minutes		0
Flash Time	0.1-1.5		CO 1.0 PBX .2
Remind Time	0/10/30/60/90		30
Park Remind	30/60/90/120/150/180		30
Pause Time	1-8		2
PBX Auto Pause	0-9		1
Dialing Ratio Tone Time	90/120/150		90
Dialing Ratio Inter-Digit Time	400/800		800
VM Dialing Ratio Tone Time	60/90/120/150		120
VM Dialing Ratio Inter-Digit Time	60/90/120/150		120
Warning Time	30		5
Recall Time	16/30/60/90/120		30
SLT Hook Flash Start	60/100/200/300...1400		200
SLT Hook Flash End	100/200/300...1500		800
Wait ICLID	3.5/4/4.5/5/5.5/6/6.5/7		4.0
VM Mon Time	10/20/30/40/50/60		10

Table A-2: CO Line Attributes

DATA FIELD	RANGE	CO LINE NUMBERS								DEFAULT
		1	2	3	4	5	6	7	8	
		700	701	702	703	704	705	706	707	
DISA Access Codes	0000-9999									Empty
DISA Line	Y/N									N
Day COS	0-7									0
Night COS	0-7									0
Service	never/day/night/ always									Always
Talk Time	1-15									5

Table A-3: CO Line Attributes

DATA FIELD	RANGE	CO LINE NUMBERS																DEFAULT
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
		700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	
CO Preset Fwd Timer	10/16/23/ 30/60																	30
CO Dest	STATION 201/272 301/372 Hunt Grps VM Grps																	Empty
COVM ID	000000-999999																	Empty

Table A-4: External Call Forward - Auto Busy Redial Parameters

DATA FIELD		RANGE	CUSTOMER DATA	DEFAULT
External Call Forward	Incoming	0 (None) 201/272 301/372		None
	Outgoing	0 (None) 201/272 301/372		None
	Service	never/day/ night/always		Always
	Talk Time	1-15		5
Unsupervised Conference Time		1-15		1
Operator Code		0/9		0
Unsupervised Conference		Y/N		Y
Auto Busy Redial	ABR Attempts	0-99		8
	ABR Interval	30/60/90/120		60
	Tone Detect. Time	0-9		4
Call Abandon	Active Call	50-2500		600
	Held Call	50-2500		600
Ring Alt Position Timer		30/60/90/120/150/180		30

Table A-5: System Application Data

DATA FIELD				RANGE	NEW DATA	DEFAULT
Station Hunt Group	Hunt Group	Group Type		Hunt/VM/AllRing		Hunt
		Group Member	1	430/453		Empty
			2	430/453		Empty
			3	430/453		Empty
			4	430/453		Empty
			5	430/453		Empty
			6	430/453		Empty
			7	430/453		Empty
			8	430/453		Empty
			9	430/453		Empty
			10	430/453		Empty
			11	430/453		Empty
			12	430/453		Empty
			13	430/453		Empty
			14	430/453		Empty
			15	430/453		Empty
			16	430/453		Empty
			17	430/453		Empty
			18	430/453		Empty
			19	430/453		Empty
			20	430/453		Empty
			21	430/453		Empty
			22	430/453		Empty
			23	430/453		Empty
			24	430/453		Empty

Table A-5: System Application Data

DATA FIELD					RANGE	NEW DATA	DEFAULT
Station Hunt Group	Hunt Group	Ring Assignment	1	700	day/night/ both/none		None
			2	701	Y/N		N
			3	702	Y/N		N
			4	703	Y/N		N
			5	704	Y/N		N
			6	705	Y/N		N
			7	706	Y/N		N
			8	707	Y/N		N
			9	708	Y/N		N
			10	709	Y/N		N
			11	710	Y/N		N
			12	711	Y/N		N
			13	712	Y/N		N
			14	713	Y/N		N
			15	714	Y/N		N
			16	715	Y/N		N
			17	716	Y/N		N
			18	717	Y/N		N
			19	718			
			20	719			
			21	720			
			22	721			
			23	722			
			24	723			
Voice Mail	ICM Prefix				0000-9999,P,✳,#		Empty
	XFR Prefix						Empty
	Record DGT						Empty
	ICM Suffix				00-99,P,✳,#		Empty
	XFR Suffix						Empty
	Disc Digits				00000000-99999999,P,✳,#		Empty

Table A-6: Restriction Data

CO CALL DESCRIMINATION Interval: (default shown)	FROM (10 digits max.)	TO (10 digits max.)	DAY ALLOWED (COS)								NIGHT ALLOWED (COS)							
			0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
001	0	9	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
002																		
003																		
004																		
005																		
006																		
007																		
008																		
009																		
010																		
011																		
012																		
013																		
014																		
015																		
016																		
017																		
018																		
019																		
020																		
021																		
022																		
023																		
024																		
025																		

Table A-6: Restriction Data (Continued)

CO CALL DESCRIMINATION Interval: (default shown)	FROM (10 digits max.)	TO (10 digits max.)	DAY ALLOWED (COS)								NIGHT ALLOWED (COS)							
			0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
026																		
027																		
028																		
029																		
030																		
031																		
032																		
033																		
034																		
035																		
036																		
037																		
038																		
039																		
040																		
041																		
042																		
043																		
044																		
045																		
046																		
047																		
048																		
049																		
050																		

Table A-6: Restriction Data (Continued)

CO CALL DESCRIMINATION Interval: (default shown)	FROM (10 digits max.)	TO (10 digits max.)	DAY ALLOWED (COS)								NIGHT ALLOWED (COS)							
			0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
051																		
052																		
053																		
054																		
055																		
056																		
057																		
058																		
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066																		
067																		
068																		
069																		
070																		
071																		
072																		
073																		
074																		
075																		

Table A-6: Restriction Data (Continued)

CO CALL DESCRIMINATION Interval: (default shown)	FROM (10 digits max.)	TO (10 digits max.)	DAY ALLOWED (COS)								NIGHT ALLOWED (COS)							
			0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
076																		
077																		
078																		
079																		
080																		
081																		
082																		
083																		
084																		
085																		
086																		
087																		
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091																		
092																		
093																		
094																		
095																		
096																		
097																		
098																		
099																		
100																		

Table A-7: Resource Data

DATA PARAMETER		RANGE	CUSTOMER DATA	DEFAULT
Ring Scheme		0/1/2/3		2
Letter Type		0/1/2/3/4/5		0
Attendant		201/272 301/372		201 301
Alternate		201/272 301/372		Empty
System Alarm	1	00:00-23:59		Empty
	2	00:00-23:59		Empty
	3	00:00-23:59		Empty
	4	00:00-23:59		Empty
	5	00:00-23:59		Empty
	6	00:00-23:59		Empty
	7	00:00-23:59		Empty
	8	00:00-23:59		Empty
Night Start		00:00-23:59		17:00
Night End		00:00-23:59		08:00
DB Programming Password		xxxxxx x=(0-9)		######

Table A-7: Resource Data

DATA PARAMETER		RANGE	CUSTOMER DATA	DEFAULT
User Password	201	0000-9999		0000
	202	0000-9999		0000
	203	0000-9999		0000
	204	0000-9999		0000
	205	0000-9999		0000
	206	0000-9999		0000
	207	0000-9999		0000
	208	0000-9999		0000
User Names	201	0-9, A-Z, a-z		Null
	202	0-9, A-Z, a-z		Null
	203	0-9, A-Z, a-z		Null
	204	0-9, A-Z, a-z		Null
	205	0-9, A-Z, a-z		Null
	206	0-9, A-Z, a-z		Null
	207	0-9, A-Z, a-z		Null
	208	0-9, A-Z, a-z		Null
Programmed Msgs Outgoing		16 Alphanumeric		Call Operator
		16 Alphanumeric		Call Home
		16 Alphanumeric		Call School
		16 Alphanumeric		Visitors Waiting
		16 Alphanumeric		Urgent
		16 Alphanumeric		Come See Me

Table A-7: Resource Data

DATA PARAMETER	RANGE	CUSTOMER DATA	DEFAULT
Executive Notify	16 Alphanumeric		Out For Lunch
	16 Alphanumeric		Be Back Soon
	16 Alphanumeric		Left For The Day
	16 Alphanumeric		In a Meeting
	16 Alphanumeric		Out Of Office
	16 Alphanumeric		On Vacation
BGM	Y/N		N
Data Link	*(For Future Use)*	N/A	N/A
RMT X_rate PC	110/300/600/1200/2400/ 4800/9600/19200		9600
Program Port BPS	4800/9600/19200		
SMDRx_rate	110/300/600/1200/2400		9600
SMDR Port BPS	4800/9600/19200		
Hour Mode	12/24		12
Dial Tone Detect	Y/N		N
Dial Wait Time	0-8		0
Modem Port	200		200

Table A-8: System Speed Dial

BIN #	Telephone Number	BIN #	Telephone Number	BIN #	Telephone Number	BIN #	Telephone Number
600		625		650		675	
601		626		651		676	
602		627		652		677	
603		628		653		678	
604		629		654		679	
605		630		655		680	
606		631		656		681	
607		632		657		682	
608		633		658		683	
609		634		659		684	
610		635		660		685	
611		636		661		686	
612		637		662		687	
613		638		663		688	
614		639		664		689	
615		640		665		690	
616		641		666		691	
617		642		667		692	
618		643		668		693	
619		644		669		694	
620		645		670		695	
621		646		671		696	
622		647		672		697	
623		648		673		698	
624		649		674		699	

B Part Numbers

This chapter contains the basic and optional part numbers used for the *STARPLUS®* *DHS-L™* Systems.

Basic/Optional Equipment

The following table lists the part numbers for the equipment that may be used with the *DHS-L* system:

Table B-1: *DHS-L* Part Numbers

DHS-L Basic KSU	SP7000-20
Master Processor Board	SP7030-00
Loop Start CO Board, 8-circuit	SP7031-00
T-1 Interface Board	SP7031-31
Digital Telephone Interface Board, 8 circuit	SP7032-08
Digital Telephone Interface Board, 16 circuit	SP7032-00
Single Line Interface Board, 16 circuit	SP7033-16
Single Line Interface Board, 16 circuit, w/msg waiting lamp	SP7033-00
Miscellaneous Service Board	SP7035-00
DTMF Receiver/Tone Detect Card	SP7035-10
Power Supply Unit	SP7071-00
2-Port Analog Adapter	SP7420-00
2-Port Analog Expansion	SP7440-00
Dark Gray-Executive Key Telephone	SP7314-71
Dark Gray-Enhanced Key Telephone	SP7312-71
Off-White-Executive Key Telephone	SP7314-08
Off-White-Enhanced Key Telephone	SP7312-08
DSS Console - Dark Gray	SP7310-71
DSS Console - Off White	SP7310-05
Caller ID Module - 4 port	1440-00
Caller ID Module - 8 port	1480-00
Caller ID Module - 9 port	7480-00

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