STARPLUS® DHS™

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Installation & Maintenance Manual Feature Package 2

Table of Contents

Revision History

Revision	Affected entry	Description:
Revision 1	N/A	First commercial revision for distribution.
Revision 1a	Key Telephone Features Description & Operation	Corrected DISA feature operation discrepancy. All other contents of Revision 1 are unaffected.
	Configuration	Corrected formatting (point size and margins).
	Appendix A	Corrected various spelling errors. Added "Tone Det. Time" to ABR of Call Handling data form. Added "CO LN Preset FWD" to Call Handling data form.
Revision 2	Multiple sections.	Corrected numerous errors and implemented Feature Package 2 features into the text.

1. INTRODUCTION

1.1 FCC REGULATIONS

1.1.1 IMPORTANT:

Customers connecting this equipment to the telephone network shall, before such connection is made, give notice to the telephone company of the particular line(s) to which such connections are to be made, and shall provide the telephone company with the following information:

- Complies with Part 68, FCC Rules.
- FCC Registration Number for PBX or hybrid operation (CO Line accessed by means of dial-access-codes or group/pooled CO line access): **D6XTAI-23086-MF-E**
- FCC Registration Number for Key System operation (CO Line access by means of individual CO Line button appearance): **D6XTAI-23085-KF-E**
- Ringer Equivalence Number (**REN**) or service code: **1.0B**
- Type and **USOC** number of the interface jack to be ordered from the telephone company: **RJ21X**

The telephone company should also be given notice upon final disconnection of this equipment from the particular line(s).

It is also the responsibility of the customer to provide the telephone company with registration numbers of any other devices which are configured for connection to the telephone network.

It is prohibited to make connections to party lines.

Under certain circumstances the telephone company may temporarily discontinue service and make changes in facilities and services which may affect the operation of this equipment; however, the customer shall be given adequate notice in writing to allow the customer an opportunity to maintain uninterrupted service.

Users should not adjust, repair, or attempt to service this equipment. In the event that a problem occurs, contact the local authorized factory service representative.

In the event of trouble with the telephone line(s), this equipment must be disconnected from the telephone line(s). If trouble ceases, the equipment must be repaired by an authorized factory service representative. If the trouble continues to occur with equipment disconnected, the telephone company should be notified that they have a problem. If this is the case, repairs or adjustments must be made by the serving telephone company.

NOTICE

THIS SYSTEM INCLUDES HEARING AID COMPATIBLE HANDSETS THAT ARE IN COMPLIANCE WITH SECTION 68.316 OF THE FCC RULES.

WARNING

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the KSU with respect to the receiver.
- Check that the KSU and receiver are not on the same circuit; the KSU must be powered from an isolated, dedicated AC outlet.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet is available from the U.S. Government Print Office, Washington, D.C. 20402, Stock No. 004-000-00398-5.

If RFI problems persist, contact Customer Service.

SAFETY REGULATIONS

The System is certified for safety approval by a Nationally Recognized Testing Laboratory (NRTL). Before installation, check your local electrical codes for installation of telephone and electronic equipment.

The following safety information is reprinted from UL 1459, a product safety specification governing telephone equipment.

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

- Read and understand all instructions.
- Follow all warnings and instructions marked on the product.
- Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

- Do not use this product near water (for example, in a wet basement).
- Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating; these openings must not be blocked or covered. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
- This product should be operated only from the type of power source indicated in the manual. If you are not sure of the type of power source to your building, consult your dealer or local power company.
- This product is equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.
- Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
- Do not use an extension cord with this product's AC power cord. The AC outlet for this product should not be used for any other electrical equipment.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
- To reduce the risk of electric shock, do not disassemble this product, but take it to a qualified servicemen when some service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect re-assembly can cause electric shock when the product is subsequently used.
- Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - When the power supply or plug is damaged or frayed.
    - If liquid has been spilled into the product.
    - If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions because improper adjustment of the controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    - If the product has been dropped or the cabinet has been damaged.
    - If the product exhibits a distinct change in performance.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

SAVE THESE INSTRUCTIONS

CAUTION

To Reduce the Risk of Fire or injury to persons, Read and Follow these instructions:

1. Use only the following type and size battery(ies) listed here as the maximum battery type and size:

   24vdc, 40AH.

2. Do not dispose of the battery(ies) in a fire. The cell may explode. Check with local codes for possible special disposal instructions.
3. 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.
4. 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.
5. 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.
6. Observe proper polarity orientation between the battery(ies) and battery charger.
7. Do not mix old and new batteries in this product (applies to products employing more than one user replaceable secondary battery).
8. 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).

LIMITED WARRANTY

For a period of twelve (12) months from the date of shipment to Buyer, Vodavi Communications Systems, Inc. warrants the equipment (except for fuses and lamps) to be free from defects in material and workmanship. In the event that during the term of the warranty the product should prove to have material or workmanship defects, Vodavi Communications Systems, Inc. will repair, or in its discretion, replace the defective equipment. No equipment of any kind may be returned without prior authorization and specific shipping instruction from Vodavi Communications Systems, Inc. and Vodavi Communications Systems, Inc. cannot accept any responsibility for material returned without such authorization.

This WARRANTY does not apply to defects or malfunctions caused by abuse, accident, modification, negligence, disaster such as fire, flood, wind, and lightning or any other damage not resulting from defects in materials or workmanship or reasons beyond the control of Vodavi Communications Systems, Inc.

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 IMPLIED WARRANTY IS MADE AGAINST UNLAWFUL OR UNAUTHORIZED UTILIZATION WHICH RESULTS IN THE INVASION OF ONE'S RIGHT OF PRIVACY.

THIS WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THIS LIMITED WARRANTY AND IN NO EVENT SHALL VODAVI COMMUNICATIONS SYSTEMS, INC. BE LIABLE FOR LOSS OF ANTICIPATED PROFITS, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF TIME OR OTHER LOSSES INCURRED IN CONNECTION WITH THE OPERATION, POSSESSION OR USE OF THE EQUIPMENT.

For complete information on returning equipment,, refer to the current Vodavi Communications Systems, Inc. Customer Service Policy. This document includes specific information on the following subjects: warranty, procedures to follow when returning equipment, equipment damaged in shipment, insurance, repair policy, and advance replacement policy.

1.2 SYSTEM TECHNOLOGY

The Starplus Digital Hybrid System (DHS) is a fully digital key telephone system comprised of an application configurable, expandable Key Service Unit (KSU) platform. The common system architecture supports three digital telephone models and an expandable D/A, A/D analog device interface. The DHS is designed to meet the telecommunications needs of small to medium sized business offices. The DHS incorporates state of the art digital technology for voice switching and call processing utilizing Pulse Code Modulation and Time Division Multiplexing (PCM/TDM). The Starplus DHS family is engineered to allow migration of the Starplus DHS 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. The DHS is a non-blocking switch, with no loss or degradation of voice signals. The system is stored-program control and utilizes a 16-bit, 8 MHz microprocessor. Memory consists of 512K bytes of ROM (Read Only memory) and 128K bytes of RAM (Random Access Memory).

When analog device interface is required, a 2-port Single Line Telephone (SLT) Adapter may be connected to any one digital station port. The 2B+D technology allows the Starplus DHS to split one digital key telephone port voice channel (B1) and the second voice channel (B2) to provide two independent SLT-type device interfaces. The 2-port SLT Adapter may be expanded with the 2-port SLT Expansion (housed in the 2-port SLT Adapter housing).

The 2-Port SLT Adapter and 2-Port SLT Expansion each require one dedicated digital station port.

Special Note:	**The application of analog devices in the Starplus DHS has the effect of two-to-one port gain. For every single digital port used to interface a 2-port SLT adapter/expansion two analog ports are available.**

The Starplus DHS Basic KSU is shipped equipped to interface three (3) loop start CO lines and eight (8) digital key telephones/2-Port SLT Adapters. The standard 3X8 CO/Station interface module is available separately and called the "3X8 Expansion Module." Two (2) 3X8 Expansion Modules may be added to the Standard 3X8 Module in the Basic KSU for a maximum configuration of 9X24 (CO lines/stations). Alternately, a "6-Port CO Module" may be substituted for one 3X8 Expansion Module allowing for greater flexibility. The maximum capacity of this configuration is 12/16 (CO/Sta). Regardless of the configuration, the system has sufficient resources to allow completely non-blocked access to all facilities (intercom and CO lines).

A Standard Background Music/Music-On-Hold (BGM/MOH) Module is also equipped in the Basic KSU. A external music source may be connected to this interface via a one-eighth inch phono plug for BGM/MOH listening. All system features are supported by the equipment provided in the Basic KSU except External Call Forward (ECF), Direct Inward System Access (DISA), Automatic Busy Redial, Unsupervised CO Line Conference, Dial Tone Detection, Loud Bell Control, External Paging, the second BGM channel, and RS232 serial ports for SMDR and Remote Programming.

When equipped, the Option Module replaces the Standard BGM/MOH Module and provides the resources for the features above. The Option Module provides two (2) DTMF receivers and two (2) Tone Detectors specifically for ECF, DISA, Unsupervised CO Line Conference, and Dial Tone Detection. Note: SLT operations do **NOT** use Option Module resources.

2. CONFIGURATION

2.1 Components

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

CPU Module

Standard 3X8 Module

Standard MOH/BGM Module (equips one music channel)

3X8 Expansion Module(s)

6 Port CO Module

Option Module

In the standard configuration the KSU is equipped to service three (3) CO Lines and eight (8) Starplus® DHS™ digital key telephones. The standard configuration is equipped to service one music channel for use as Background Music and Music On Hold and all system features except Dial Tone Detection, External Call Forwarding, Direct Inward System Access, Automatic Busy Redial, SMDR (Station Message Detail Recording), Loud Bell Control, External Voice Paging, second BGM channel and Unsupervised Conference. These advanced call processing features require the Option Module for operation.

The Starplus® DHS™ is scaleable to meet a variety of applications. The 3X8 Expansion Module and 6 Port CO Module are interchangeable expansions. The 3X8 Expansion Module is identical to the standard 3X8 Module shipped with each Basic KSU. 3X8 modules interface 3 loop start CO lines and 8 Starplus DHS digital key telephones. As implied, 3X8 Expansion Module(s) (2 maximum) may be added to the Basic KSU to increase system capacity in increments of 3 CO lines and 8 stations.

The 6 Port CO Module may be substituted for either expansion 3X8 Expansion Module to interface 6 loop start CO lines. Only one (1) 6 Port CO Module may be installed in the Basic KSU.

The following system configurations are possible:

Equipment installed:	Maximum number of loop start CO lines.	Maximum number of Starplus DHS digital key telephones.
1-3X8 module	3	8
2-3X8 modules	6	16
3-3X8 modules	9	24
1-3X8 module and 1-6 Port CO Module	9	8
2-3X8 modules and 1-6 Port CO Module	12	16

2.1.1 Station apparatus is comprised of the following components:

- Executive Key Telephone
- Enhanced Key Telephone
- Basic Key Telephone
- 2 Port SLT Adapter
- 2 Port SLT Expansion

(Note: key telephones are available in two colors; "Off White" and "Charcoal Gray".)

2.2 System Administration

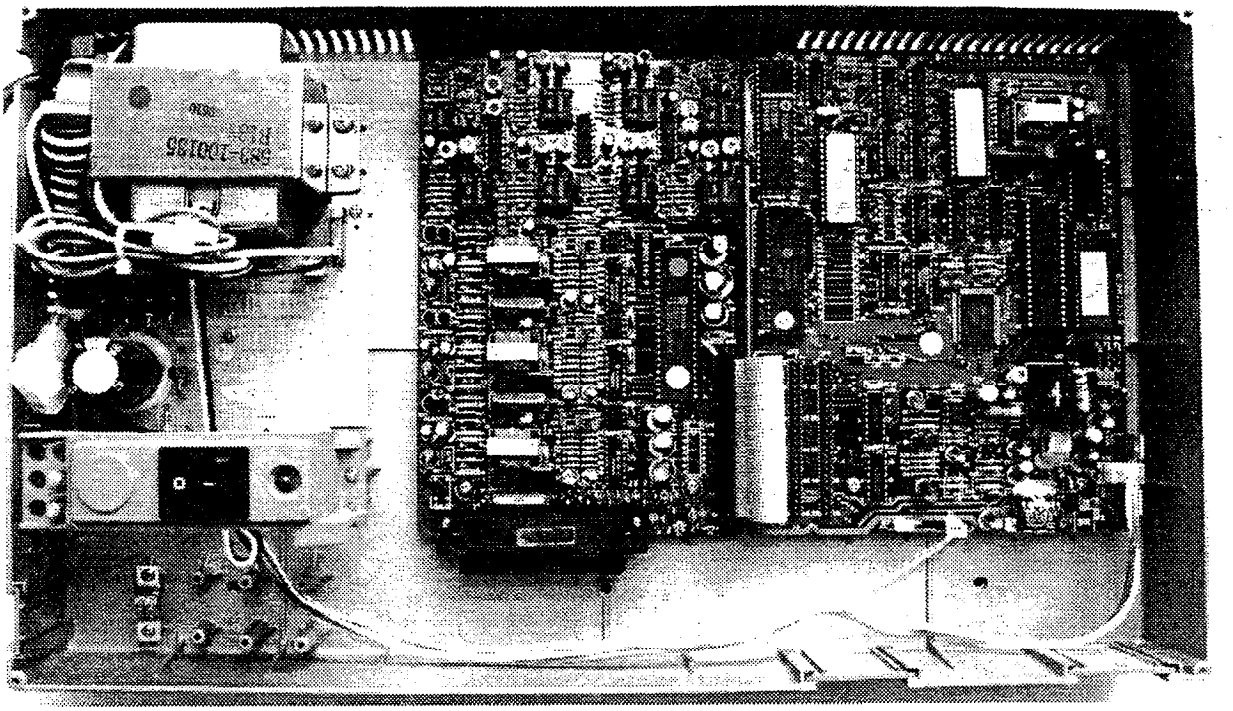
The system's default customer data base can be entered and changed, under password control, from any Executive Key Telephone. All Customer information is protected by an internal rechargeable NiCad battery. Programmable password protection is allowed for each station, system administrator and external (DISA) callers.

2.3 Key Service Unit

The Starplus DHS Basic Key Service Unit (KSU) is a modular flat-pack design. It is a self-contained cabinet with internal power supply, common control circuits (CPU board) and Standard 3X8 Module. The power supply AC transformer is hard-wire selected for either 117vac or 230vac operation. (It is shipped wired for 117vac operation.) The KSU is designed for wall mount and shipped with a wall mounting template. The compact KSU weighs less than 20 pounds and is UL Listed.

Standard panels installed over various KSU openings may be removed or repositioned to accommodate exterior connection requirements. Three such panels are present. One may be removed to route a serial cable through the KSU outer housing for connection of SMDR equipment. Another may be removed to route a serial (NULL Modem) cable through the KSU outer housing for connection of a modem or PC (via a straight-through cable). This serial port is used for remote programming and maintenance. Both serial ports are provided when the Option Module is installed. One KSU opening panel may be removed or repositioned to accommodate cable entry requirements through the outer housing for connection to the MDF.

KSU (cover removed)



2.4 Power Supply

The power supply circuitry of the Starplus® DHS™ incorporates a linear design transformer with a choice of input voltage taps. The transformer primary windings are shipped wired for 117vac applications. A factory insulated tap wire may alternately be connected for 230vac applications. Since the power supply is linear in design the output voltage varies between 21.6vdc and 32vdc depending on load and stability of the input voltage. The output voltage is delivered to the CPU board for distribution and rectified there for logic and control voltages.

Two fuses are equipped on the power supply board, one for ac input over-voltage protection and one for dc output over-voltage protection. A DPDT (Double Pole Double Throw) switch is accessible from outside of the KSU when the KSU cover is in place. The DPDT switch will simultaneously switch AC input and DC output circuits on and off. In the event battery backup operation is desired and equipped via the optional Starplus® BBU (Battery Backup Unit), the KSU switch may be used to switch off/on power from both sources.

The power supply wiring harness is equipped with a Mate-n-lock connector on the DC output for connection of the Starplus® BBU. When equipped the BBU will maintain complete system operation during commercial power outages. A current draw/configuration chart is included in this document for assistance in selecting the appropriate batteries for use in the BBU. Please refer to the BBU manual for installation precautions and proper battery installation.

2.5 CPU

The CPU board is standard in the Basic KSU. This board contains all circuitry required to control the fully equipped Starplus® DHS™. Three buss connectors are provided where the station/CO line interface 3X8 Expansion Module and 6 Port CO Module are connected. The Option Module connector and Standard MOH Module connector are also located on the CPU board. All digital voice switching and call processing data switching is accomplished on the CPU board.

The CPU and common control statistics are as follows:

Processor	**:**	**NEC V20**
speed	**:**	**8MHz**
Memory ROM	**:**	**512K Bytes**
RAM	**:**	**128K Bytes**
Controller	**:**	**Interrupt**
Recovery	**:**	**Watch Dog Timer**
Voice switching	**:**	**PCM (Pulse Code Modulation)**
Data switching	**:**	**TDM (Time Division Multiplexing)**

2.6 Standard 3X8 Module

Installed in the Basic KSU at the factory is the Standard 3X8 Module. This module is in fact exactly the same as the 3X8 Expansion Module.

2.7 3X8 Expansion Module (includes standard 3X8 module)

Provides interface of 3 loop-start CO lines and 8 Starplus DHS Key Telephones or 8 Starplus 2 Port SLT Adapters/Expansions. The 3X8 Expansion Module is shipped with four (4) mounting stand-offs used to install the board into the Basic KSU

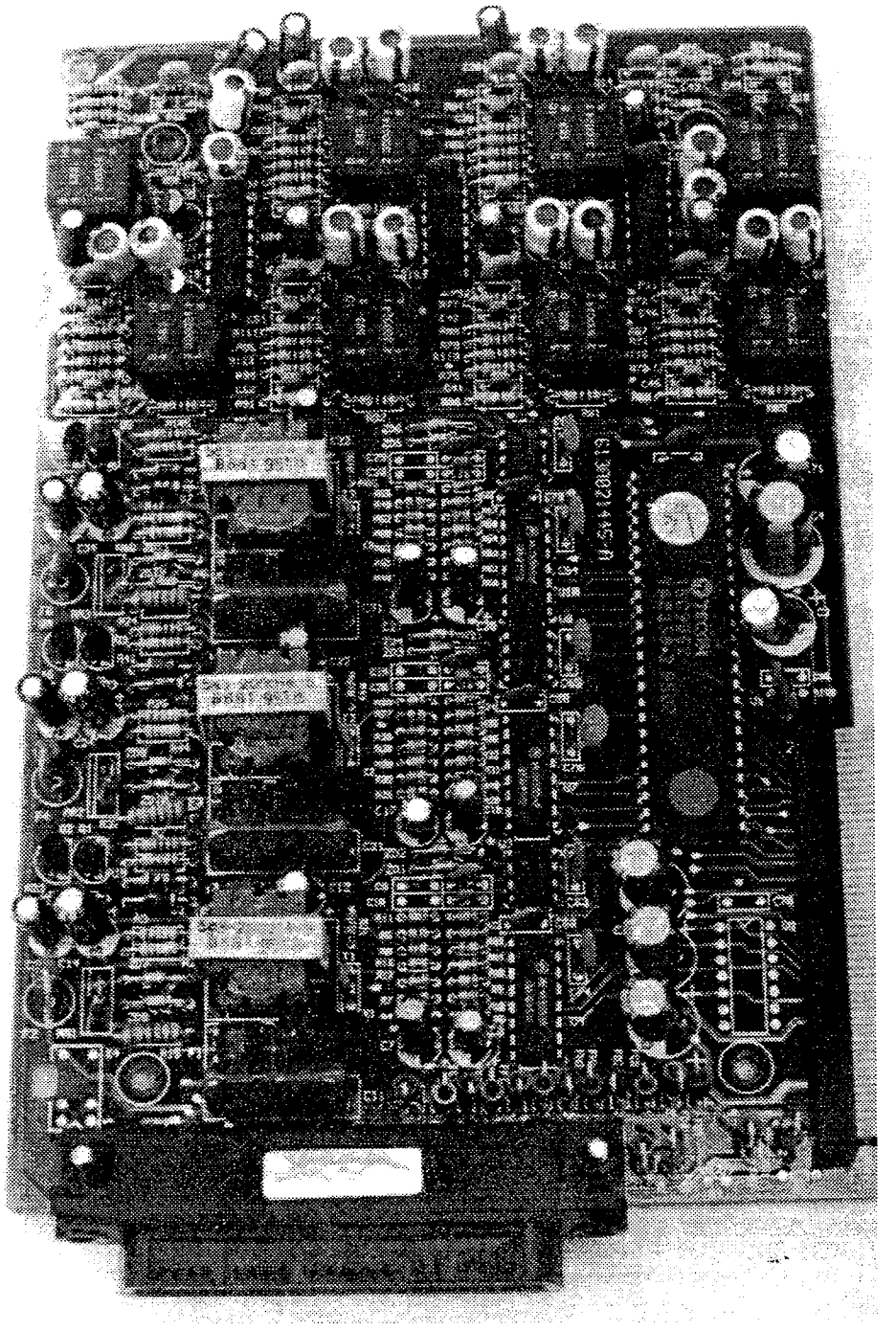
Each CO line circuit incorporates over-voltage protection, ring detector, loop detector, loop/pulse-dial relay, current sink circuit, Coupling/isolation transformer (impedance 600:600), hybrid circuit and COMBO (CODEC & filter) polarity guard circuit and Radio Frequency noise filter.

Each digital key telephone port is comprised of a proprietary octal ASIC (Application Specific Integrated Circuit) transceiver designed using ISDN type 2B+D architecture. At this time the "D" channel is used for call processing control of digital key telephone functions/operations and one "B" channel is used for the digital key telephone voice channel. The second "B" channel is unused at this time for digital key telephone operation. When used in conjunction with the Starplus 2 Port SLT Adapter or Starplus 2 Port SLT Expansion, the "B2" channel is used to provide a digital voice path for a second SLT station. Both 2

port SLT devices have a port gain characteristic that allows two SLT (analog) devices to be operated from one digital key telephone port.

Each digital station interface is protected against circuit wiring shorts by an over-current protection polyswitch. The digital station circuit requires only one cable pair to operate and is not polarity sensitive.

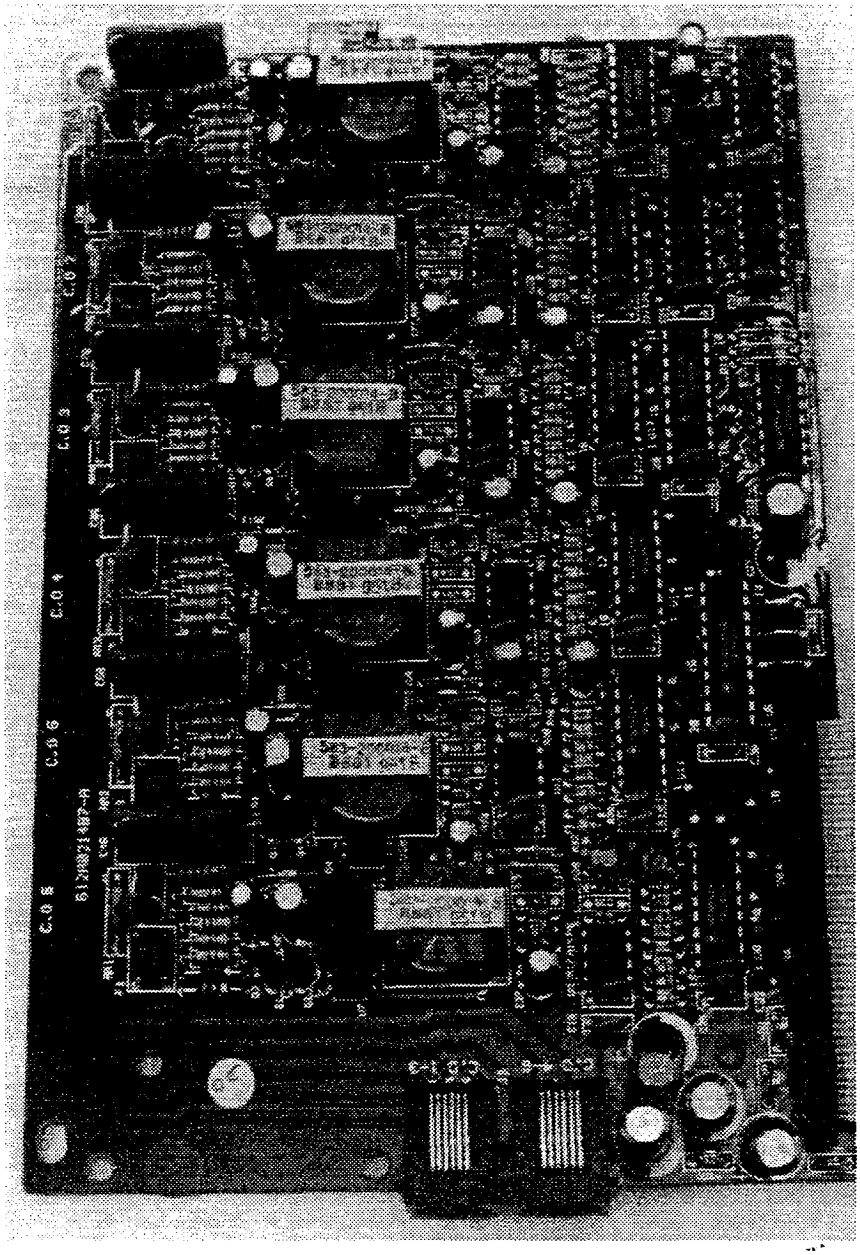
Physical connection of stations and CO lines to the 3X8 module is made through one 25 pair amphenol-type connector to the MDF (Main Distribution Frame). Station power to both digital key telephones and 2 Port SLT Adapter/Expansion is provided by a single twisted pair from the 3X8 module to the MDF.



2.8 6 Port CO Module

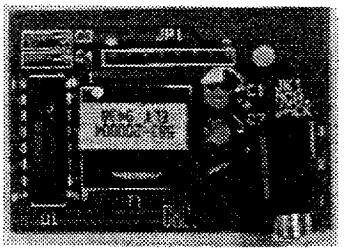
The 6 Port CO Module may alternately be equipped in place of either 3X8 Expansion Module. The 6 Port CO Module interfaces 6 loop-start CO lines only. No station interface is provided on this module. The 6 Port CO Module is shipped with four (4) mounting stand-offs used to install the board into the Basic KSU, two(2) six-conductor modular line cords and two (2) six-conductor modular blocks. The mounting cords and modular blocks are used to extend the CO line interface circuits to the MDF for connection.

Each CO line circuit consists of an over-voltage protector, ring detector, loop detector, loop/pulse-dial relay, current sink circuit, isolation transformer, hybrid circuit and COMBO (CODEC & filter).



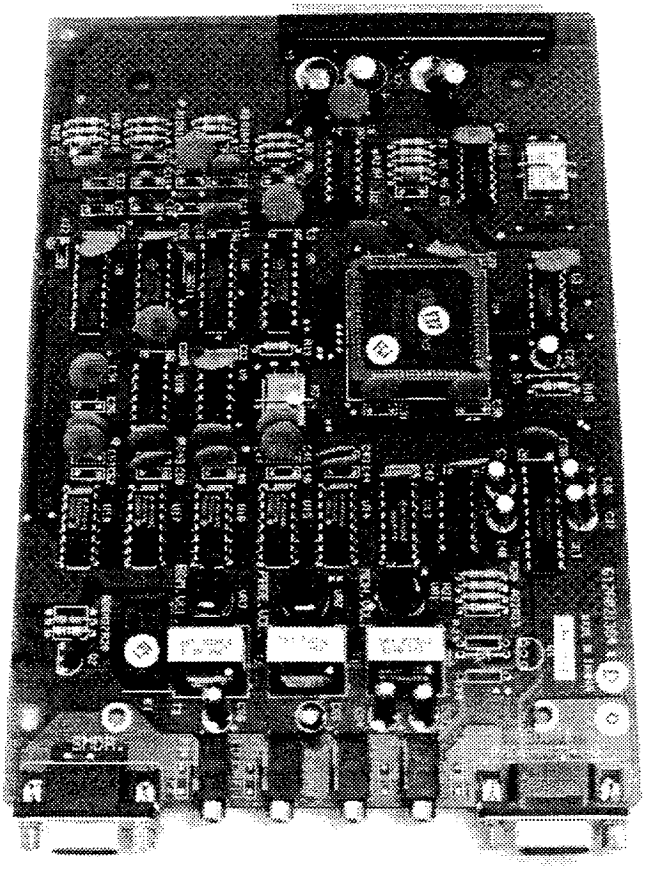
2.9 Standard MOH/BGM Module

The standard MOH/BGM Module is pre-installed at the factory and used to interface one external music source that will be used for callers who are placed on hold and station users who activate BGM listening. Connection of the external music source to the MOH/BGM Module is made via an eighth-inch phono type connector.



2.10 Option Module

The Option Module replaces the standard MOH/BGM Module. This module comprises all additional system resources required to make all system features operational. The Option Module contains 2 DTMF receivers and 2 Tone Detectors that facilitate the following features; Dial Tone Detection, External Call Forwarding, Direct Inward System Access, Automatic Busy Redial and Unsupervised Conference. Interface circuits and hardware connectors for SMDR (Station Message Detail Recording), PC Programming, Caller ID, Loud Bell Control, External Voice Paging and two music sources are also provided. Connectors for SMDR and PC Programming are standard 9-pin RS-232 (serial) connectors. Connectors for Loud Bell Control, External Voice Paging, MOH/BGM and BGM2 are eighth-inch phono type connectors.



2.11 Digital Key Telephones

The Starplus DHS supports three proprietary digital terminal models and an 2 Port SLT Adapter/Expansion. All key telephone models operate on one single twisted pair and provide D/A, A/D conversion at the terminal.

2.11.1 Basic Key Telephone:

The Basic Key Telephone is equipped with a speaker for monitoring call progress and receiving Call Announcements but is not equipped with a microphone for Hands-Free reply. The Basic Key Telephone has 16 buttons, 8 of which are fixed function buttons to control settings and primary key telephone call processing operations. These buttons are; HOLD, TRANS (transfer), FEAT (Feature), CLEAR, MUTE, SPKR (Speaker), and Volume UP/DN.

Eight (8) buttons are user Programmable Feature Buttons equipped with dual color LED's that are pre-assigned default settings for quick power up operation. These buttons are arranged in two rows and four columns. Beginning at the top left button they are assigned the following default values; CO line 1, CO line 2, CO line 3, CO line 4, CO line 5, CO line 6, HF/Tone and Message Waiting.

The Basic 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.

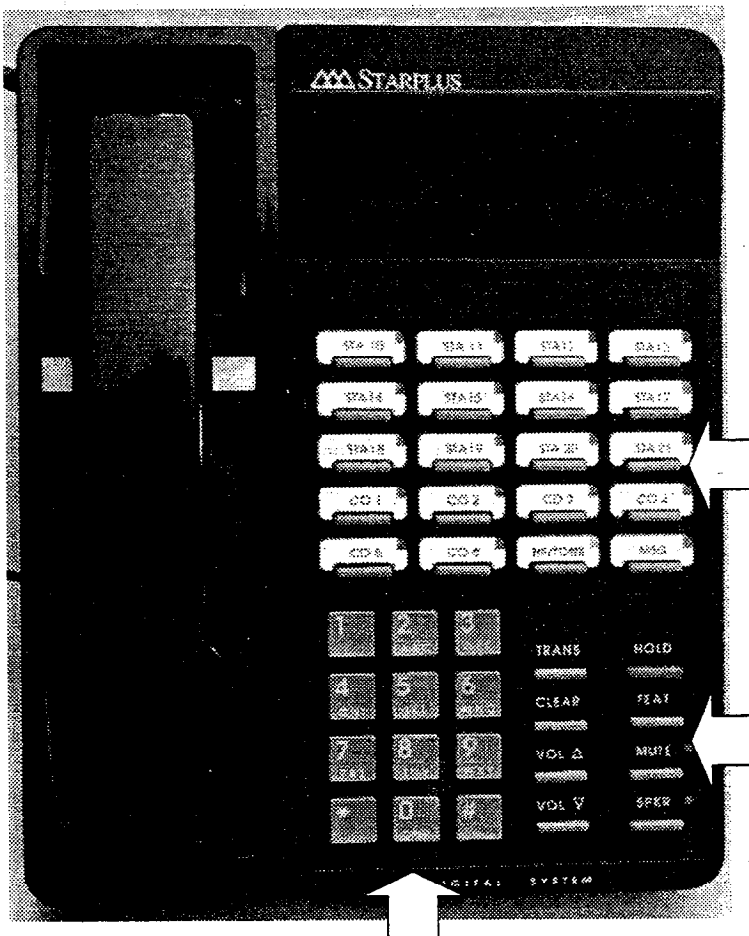
(Note: the Basic Key Telephone is not pictured.)

2.11.2 Enhanced Key Telephone:

The Enhanced Key Telephone is fully equipped for hands-free, speakerphone operation. The Enhanced Key Telephone may make and receive calls hands-free. This key telephone is expanded to twenty-eight (28) buttons. 8 fixed function buttons remain consistent with those of the Basic Key Telephone.

Twenty (20) buttons are user Programmable Feature Buttons equipped with dual color LED's that are 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 10 - 21, CO line 1 - 6, 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.



Each telephone is equipped with an ADP (Additional Device Port) 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.)

Programmable Feature buttons. At default (as shipped) these keys are from upper left:
DSS (station call/status) buttons for stations 10-21.
Starting at button 13 buttons are CO line 1-6, HF/Tone and Message Waiting.
Shown is the Enhanced Key Telephone. The Basic Key Telephone has buttons 13-20 only (CO line1-6, HF/Tone and Message Waiting.)

Fixed Feature Buttons (can not be changed). From upper left are:
TRANS Ttransfer)
HOLD
CLEAR
FEAT (Feature)
VOL ^ (Volume Up)
MUTE
VOL v (Volume Down)
SPKR (Speaker)

Standard 12-key Dial Pad

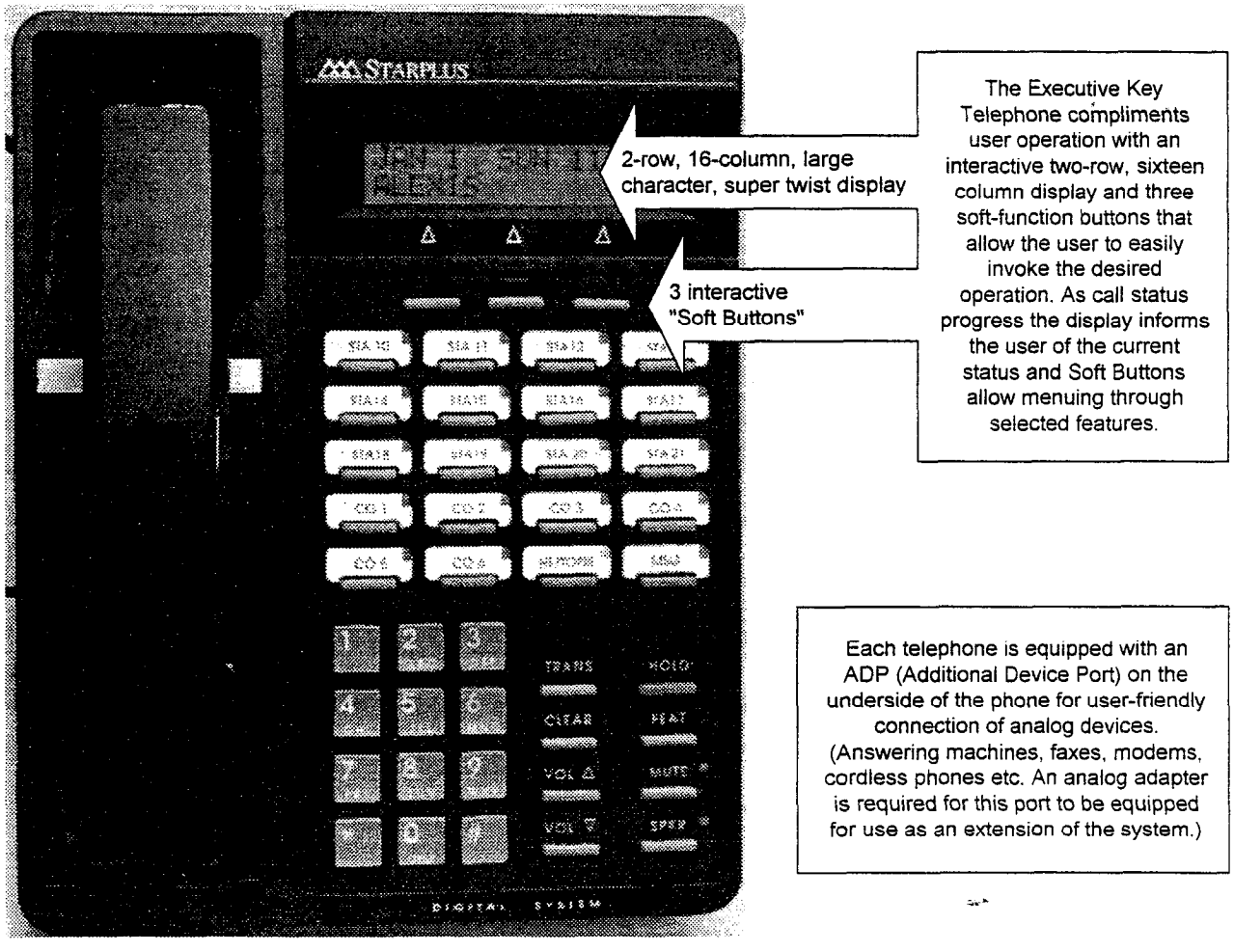
2.11.3 Executive Key Telephone:

The Executive Key Telephone model has a two-row by sixteen column (32-character) dot-matrix 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. The display provides a visual reference to call progress and call duration, as well as time and date information. The display also enables the Executive Key Telephone user to send and receive visual advisory and call-back messages. Users may select from six "canned" messages (i.e. "IN A MEETING," "OUT OF OFFICE"), or they may create a custom message. Incoming calls from display telephones to such a station will receive the visual advisory message on their LCD display. In addition display telephone users may leave one of seven call-back messages (i.e. "CALL OPERATOR," "URGENT") on the display of another user's telephone.

The Executive model telephone is fully equipped for hands-free, speakerphone operation. The Executive Key Telephone may make and receive calls hands-free.

The Executive Key Telephone has the same twenty (20) Programmable Feature Buttons as the Enhanced model, but includes three (3) additional interactive Soft Buttons. 8 fixed function buttons remain consistent with those of the Basic Key Telephone .



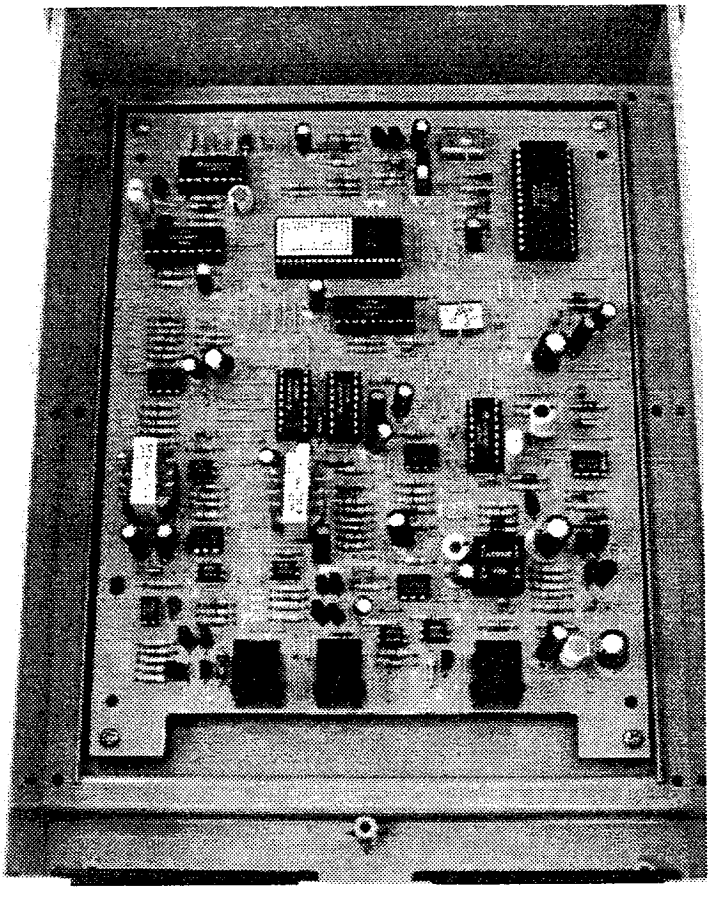
2.12 2 Port SLT (Single Line Telephone) Adapter

A 2 Port SLT Adapter is optionally available which will support most auxiliary equipment found on the business premises such as fax machines, answering devices and single line telephones. Each adapter requires an unused digital station port and will yield two (2) analog device interfaces.

The 2 Port SLT 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 SLT Adapter generates -30VDC and 20-25Hz, 50V square wave ringing for operation of single line telephones, fax machine, answering device, modem, etc. All termination's are by RJ-11 connection.

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). Ancillary analog devices connected to the 2 Port SLT Adapter must generate DTMF signaling. (Pulse dial (rotary-dial) telephones/equipment are not supported.)

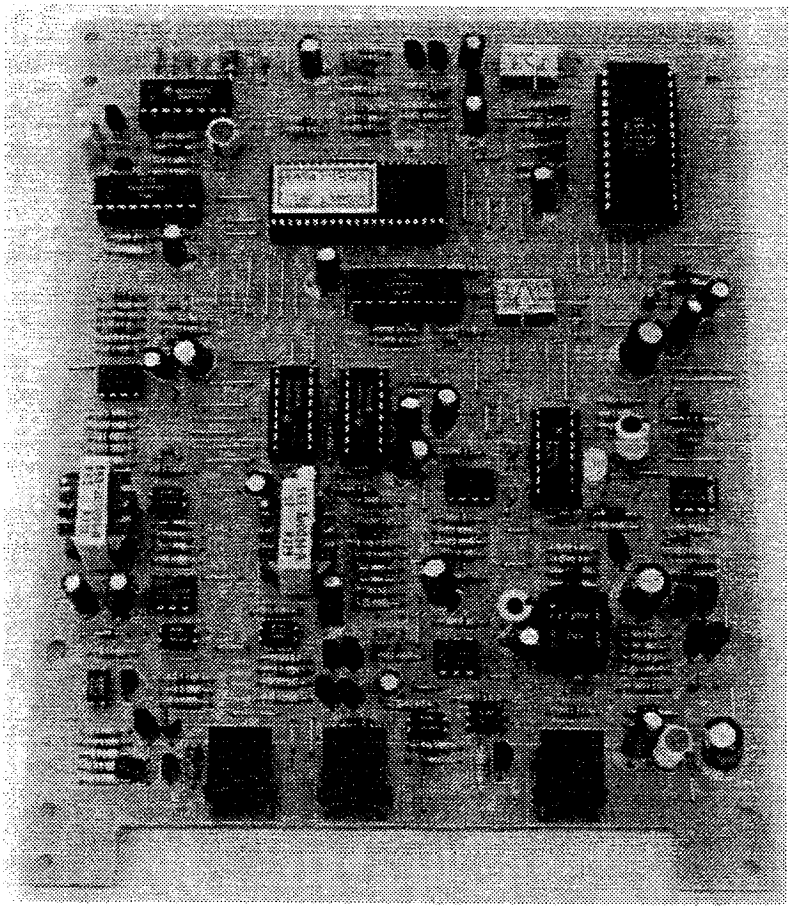
The 2 Port SLT Adapter provides adequate housing space for one 2 Port SLT Expansion.



2.13 2 Port SLT Expansion

A 2 Port SLT Expansion module is optionally available and is designed to be installed inside the 2 Port SLT Adapter housing. The 2 Port SLT Expansion provides the same interface capabilities of the 2 Port SLT Adapter and is in fact comprised of the same circuit board used inside the 2 Port SLT Adapter. The 2 Port SLT Expansion is shipped without a mounting enclosure and is installed inside of the 2 Port SLT Adapter to expand analog device interfaces to the Starplus DHS.

Important: the 2 Port SLT Expansion requires its own, dedicated digital Starplus DHS port for operation.



3. SPECIFICATIONS

Digital Hybrid System Capacities	
Time Slots:	PCM - 32 time slots x 4 Highways (128 voice channels) TDM 64 Time Slots (data processing)
Customer Database memory protection	300 hours on a fully charged battery (the internal Nicad battery requires 14 continuous powered hours of system operation to become fully charged.)
Ports: CO/PBX/Centrex Lines Digital Stations Standard Single Line Telephones	 12 (Note: 16 Stations max. with this configuration.) 24 (Note: 9 CO lines max. with this configuration.) 46 (Note: one digital port must be reserved for digital station operation. One digital station port is used for every two SLT ports required.)
DTMF Receivers: 2 Port SLT Adapter 2 Port SLT Expansion Option Module	 2 (One for each SLT port.) 2 (One for each SLT port.) 2 (Shared for advanced call processing system features; DISA, ECF)
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 Tone, Ring-back Tone, etc.)	2 (Shared for advanced call processing system features; DISA, ECF, ABR. etc.)
Contacts:	1 LBC contact is available via the Option Module.
Conference circuits:	8 - 4 party conference circuits.
DISA circuits:	Any number of CO lines may be programmed for DISA operation.
System Attendants:	1 + 1 Alternate Position for overflow call handling.
Hunt Groups: Members per group: Group Types:	8 24 Pilot Hunt Group or Voice Mail Group

Digital Hybrid System Capacities (cont.)	
Voice Mail Groups: Members (ports): Integration Method: VM Message Waiting: VM Control codes:	1 (Selected as VM type from HG.) 24 In-band #96 + station number to turn VM button LED on. #*96 + station number to turn VM button LED off. Disconnect Digit(s): 8 digits max. Prefix for intercom calls: 4 digits max. Prefix for transferred calls: 4 digits max. Record Digits for Voice Recorder function: 4 max. Suffix for intercom calls: 2 max. Suffix for transferred calls: 2 max.
CO Line Loop Current sensing:	Interrupt programmable from 50ms to 2500ms.
Paging:	8 Internal Page Extension Groups 1 External Page Port(via Option Module) 1 Internal All Call 1 System (Internal/External) All Call
System Speed Dialing:	80 Total, 16 digits per bin.
Station Speed Dialing (DKT & SLT):	20 Total per station, 16 digits per bin.
Last Number Redial:	16 digits per station
Save Number Redial:	16 digits per station
User Saved Number (Memo):	20 digits per station
Callback request per station:	1
Camp On by a busy station:	1
Stations Camped on to a station:	1
Stations Camped on to a busy line:	1
Message - Executive Notification:	6 preprogrammed 1 personal per station
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.
CDB Programming Password:	6 digits ("000000" at default).
System Reminder Alarm:	8 time settings.
Station Alarm:	1 per station.
Ring Schemes:	3
Distinctive Ring Tones:	4 per station.
External Call Forward:	1 incoming line, 1 outgoing line.

Electrical Specifications	
AC Power source:	Dedicated 117/230vac ± 15%, 47-63Hz single phase
Power consumption:	1.5A maximum @ 120vac (180 watts)
Power Supply fuse: AC input: DC output:	 2A 250v 1A 125v
Idle Channel Noise	-74 dB
Cross Talk Attenuation	75 dB (@ 1kHz)
Ringing Sensitivity	40v RMS 25 Hz
Ringer Equivalence Number	1.5
CO Line Signaling	DTMF amplitude (-5 dB,-7 dB) +- 2 dB, @ approx. 2 Vpp Pulse Dialing ratio 60/40 @ 10 PPS
Music source / Background Music	0 dBm at 600 ohm input impedance 1/8th inch phono jack
Contact rating (Option Module LBC):	1A @ 30VDC 0.5A @ 90VAC 30Hz 1/8th inch phono jack
External Page Port	0 dBm at 600 ohms 1/8th inch phono jack

Environmental Specifications	
Operating Temperature:	0° to 40° C, 32° to 104° F
Recommended Operating Temperature:	70° to 78° F
Storage Temperature:	-40° to 185° F
Operating Relative Humidity:	5% to 90% (non-condensing)
Heat Dissipation (BTU):	300

Unit Specifications

Part Number	Description	Dimensions:			Weight
SP7000-00	Basic KSU	L W H	460 mm 270 mm 105 mm	18.4 in. 10.8 in. 4.2 in.	4.0Kg 8.8in.
SP7110-00	Option Module	L W H	212 mm 140 mm 22 mm	8.48 in. 5.6 in. 0.88 in.	0.4Kg 0.88in.
SP7100-00	3X8 Expansion Module	L W H	215 mm 130 mm 22 mm	8.6 in. 5.2 in. 0.88 in.	0.4Kg 0.88in.
SP7100-10	6 Port CO Module	L W H	215 mm 130 mm 22 mm	8.6 in. 5.2 in. 0.88 in.	0.3Kg 0.66in.
SP7420-00	2 Port SLT Adapter	L W H	320.5 mm 184.5 mm 65 mm	12.82 in. 7.38 in. 2.6 in.	0.4Kg 0.88in.
SP7440-00	2 Port SLT Expansion	L W H	198 mm 149 mm 22 mm	7.92 in. 5.96 in. 0.88 in.	0.7Kg 1.54in.
SP7314-71	Dark Gray – Executive Key Telephone	L W H	234 mm 188 mm 64.5 mm	9.36 in. 7.52 in. 2.58 in.	1.2Kg 2.64in.
SP7312-71	Dark Gray – Enhanced Key Telephone	same as above			
SP7311-71	Dark Gray – Basic Key Telephone	same as above			
SP7314-08	Off-White – Executive Key Telephone	same as above			
SP7312-08	Off-White – Enhanced Key Telephone	same as above			
SP7311-08	Off-White – Basic Key Telephone	same as above			

Maximum Cable Length

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

Dialing Specifications

DTMF Dialing mode:	
Frequency deviation:	± 1%
Rise time:	3ms
Duration of DTMF signal:	programmable 50-150ms (70ms default)
Inter-digit time:	programmable 50-150ms (70ms default)
VM Port DTMF duration:	programmable 60-150ms (120ms default)
VM Port Inter-digit time:	programmable 60-150ms (120ms default)
Pulse Dialing mode:	
Pulse dial rate:	10 pulses per second
Pulse Make/Break ratio:	60/40

FCC Registration Numbers

For systems configured for Key System operation (each CO line appears on its own dedicated button).	D6XTAI-23085-KF-E
For systems configured for hybrid operation (CO lines may be accessed by dial codes and Pool/Loop buttons).	D6XTAI-23086-MF-E

Audible Signals

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

Environmental Conditions		
REQUIREMENTS	IN OPERATION	IN STORAGE
Temperature KSU	32° to 104° F 0° to 40° C	-40° to 185° F -40° to 85° C
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%
Altitude	Up to 10,000 ft. (3,048 m.)	Up to 40,000 ft. (12,192 m.)

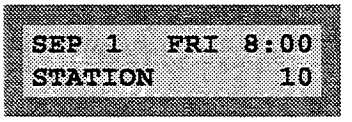
Mean-Time Between Failure Analysis - System components	
Case Assembly	100.0
Power Supply Unit	193.0
CPU Module	3095.0
Standard Music On Hold Module	325.7
Standard 3X8 Module & 3X8 Expansion Module	5744.0
6-Port CO Line Module	7201.2
Option Module	2866.0
Basic Key Telephone	2988.3
Basic & Enhanced Key Telephone	4205.3
Executive Key Telephone	4275.3
2-Port SLT Adapter & 2-Port SLT Expansion	5000.9
Method: 1. Use the figures above for each unit installed (or to be installed) and calculate the total for this system configuration. 2. Use the total from step 1 in place of the variable "x" in the formula at the right to calculate MTBF for this system configuration.	**$(1 \div x)(10^9)$ = MTBF hours**

4. KEY TELEPHONE FEATURES DESCRIPTION & OPERATION

4.1 General Conventions:

- Press the CLEAR button to cancel the current operation.
- The FEAT button joined with dial key codes will appear throughout the text. This button (Feature) is used to access most system features.
- System resources are accessed using directory numbers to dial access the resource (station numbering, Hunt Group numbering, etc.)
- Any feature or resource code may be stored for one-button access under an available Programmable Feature Button.
- "Operation" steps are oriented for the Executive Key Telephone since the interactive LCD prompts encompass all Executive Key Telephone functions.
- Specific "Operation" steps for the Basic and Enhanced Key Telephone are enclosed in brackets "{}" to distinguish operational differences. If there are no specific operation steps listed ({}) the operation of that feature is identical for all key telephone models.
- Database Programming can be executed at any idle Executive Key Telephone. Only one station may enter the Database Programming mode at any time.
- 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.
- Valid programming is confirmed with a single beep tone from the speaker. Invalid programming is alerted with a double beep tone.

The following is an example of the LCD display at an idle Executive Key Telephone. Throughout the manual the LCD will be shown with the associated Soft Button prompts, the actual Soft Buttons are immediately below the bottom line of the display oriented at left, center and right positions.



4.2 Soft Button prompts:

bksp (Backspace): When the new programming data entry is not desired, the station user may press the **bksp** button to erase the last data entered and return to the immediately preceding prompt.

save (Store): When the new data are entered, the system will check the entered data automatically. If the entry is invalid, the prompt will be refreshed. If the entry is valid, the station user must press the **save** button to confirm entry and continue with the next prompt item.

chg (Change): Press the **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 (Display): Press the **show** button to enter into detailed feature item programming of a specific category, or to display current programmed content of the feature.

4.3 Feature Listing

Feature	Key Telephone model: Basic	Enhanced	Executive
Account Code Tracking	x	x	x
ADP Jack	x	x	x
Alarm Clock	x	x	x
Attendant Administration	-	-	x
Authority Code	x	x	x
Auto Busy Redial	o	o	o
Auto Hold	x	x	x
Auto Line Select	x	x	x
Background Music	x	x	x
Busy Lamp Field	x	x	x
Call Attendant	x	x	x
Call Back	x	x	x
Caller ID (Feature Package 2 only)	-	-	x
Caller ID Unanswered Call Table (FP 2)	-	-	x
Call Forward	x	x	x
Call Park	x	x	x
Call Pick Up	x	x	x
Call Waiting	-	-	x
Camp On	x	x	x
Clear	x	x	x
Conference	x	x	x
DISA	x	x	x
DSS/BLF	x	x	x
Distinctive Ringing	x	x	x
Do Not Disturb (DND)	x	x	x
Flash	x	x	x
Flex Button Inquiry	-	-	x
Flexible Button Programming	x	x	x
Forced Tone Ringing	x	x	x

Feature	Basic	Enhanced	Executive
Hands-free Answer-back	-	x	x
Headset Mode	x	x	x
Hold	x	x	x
Holding Call Answer/Select	x	x	x
Hold Reminder	x	x	x
Intercom	x	x	x
Last Number Redial	x	x	x
Meet Me Page	x	x	x
Message	x	x	x
Message Waiting	x	x	x
Mute	x	x	x
Night Service	FP2	FP2	x
On Hook Dialing	x	x	x
Paging	x	x	x
Phone Lock/Unlock	x	x	x
Privacy	x	x	x
Pulse to Tone Conversion	x	x	x
Ringing Line Priority	x	x	x
Save Dialed Number	x	x	x
Speed Dialing	x	x	x
Station Feature Status Check	-	-	x
Transfer	x	x	x
Transfer Recall	x	x	x
Voice Announce	x	x	x
Voice Mail Integration	x	x	x
Voice Mail Monitor (FP 2 only)	**x**	**x**	**x**
Voice Over Busy	x	x	x
Voice Recorder (Feature Package 2 only)	**x**	**x**	**x**

Refer to Appendix A for Feature Access Codes Table and System Numbering Plan.

4.4 Feature Operation

4.4.1 Account Code - Forced Verified

4.4.1.1 Default Setting: N/A

4.4.1.2 Related Feature(s):

Station Toll Restriction
Auto Line Select
SMDR (Station Message Detail Recording)

4.4.1.3 Related Programming:

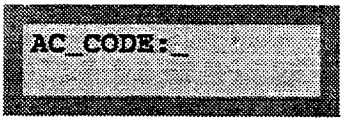
RESOURCE - AC_CODE TABLE
STATION - DAY/NITE CLASS

4.4.1.4 Description:

When enabled. you must dial an account code in order to make an outgoing call on a CO line. The system compares the code you dialed with those in the Account Code Table. If a match is found you can make the outgoing call.

4.4.1.5 Operation:

1. Press an idle CO line button.
2. When you hear a tone, dial a valid account code. An Executive telephone will show the following on the display:



3. Upon hearing confirmation tone and dial tone, you may now dial on the line.

When you hang up, the account code that you dialed will be displayed in the SMDR call record printout.

Notes:

a. If you dial an invalid account code you will hear error tone and will not be able to access the line. An Executive telephone will display "CALL RESTRICTED".

b. If an error occurs you may re-dial a new account code by returning to Step 1 above.

c. When you dial a valid account code your telephone is still monitored for toll restriction according to the Class of Service (COS) assigned to your telephone.

4.4.2 Account Code Unforced/Unverified FEAT 7 PRS 1

4.4.2.1 Default Setting: N/A

4.4.2.2 Related Feature(s):

Station Toll Restriction
Auto Line Select
SMDR (Station Message Detail Recording)

4.4.2.3 Related Programming:

RESOURCE - AC_CODE TABLE
STATION - DAY/NITE CLASS

4.4.2.4 Description:

You may dial a personal or departmental account code for future tracking of time spent on customer accounts.

4.4.2.5 Operation:

1. Press an idle line button.
2. Press FEAT.
3. Dial 7 PRS 1.
4. Dial account code.
5. Dial *. At an Executive Telephone, press "**save**".

At an Executive Telephone you may press "**bksp**" to erase each number in the account code, or press "**chg**" to erase the entire account code.

Note: If an error occurs you may re-dial a new account code by returning to Step 1 above.

4.4.3 ADP™ Jack

4.4.3.1 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 MDF 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, two-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. The ADP jack allows complete flexibility of system resources. Used in conjunction with the SLT Adapter and the port gain characteristics of that unit, ADP open wiring allows complete adaptation of the application requirements.

4.4.4 Alarm Clock (Station) FEAT 9 WXY 2 ABC

4.4.4.1 Default Setting: Empty

4.4.4.2 Related Feature(s):

None

4.4.4.3 Related Programming:

Attendant System Mode - Time

4.4.4.4 Description:

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

If you desire the alarm to sound at the same time everyday you must program it each day.

4.4.4.5 Programming: Basic and Enhanced Telephones

While your telephone is idle;

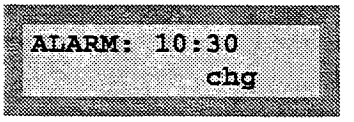
1. Press FEAT.
2. Dial 9 WXY 2 ABC...
3. Dial the desired alarm time as Hour/Hour:Minute/Minute in 24 hour format. For instance, dial 0930 for 9:30am, 1500 for 3:00pm, etc.

4.4.4.6 Programming: Executive Telephone

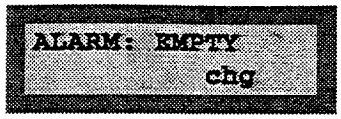
While your telephone is idle;

1. Press FEAT.

Dial 9 WXY 2 ABC. The display will show an alarm time previously programmed or will show "EMPTY".



OR



3. Press "**chg**".
4. Dial the desired alarm time as Hour/Hour:Minute/Minute in 24 hour format. For instance, dial 0930 for 9:30am, 1500 for 3:00pm, etc.
5. Press "**save**".

4.4.4.7 Operation Basic and Enhanced Telephones Turn Off a signaling Alarm:

When the alarm time is reached you will hear tone ringing.

1. Press FEAT.
2. Dial * 9 WXY 2 ABC.

4.4.4.8 Operation Executive Telephone To Turn Off a signaling Alarm:

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

- Press "**ack**".

4.4.4.9 To Cancel a Programmed Alarm:

1. Press FEAT.
2. Dial * 9 WXY 2 ABC. An Executive Telephone will display "ALARM DELETE".

Notes:

a. The alarm clock will be canceled automatically after the alarm time is reached.
b. The Executive Telephone display will be unchanged until "**ack**" is pressed or when the telephone is used for another call.
c. The Alarm Clock feature code may be programmed on any programmable feature button.

4.4.5 Alarm Clock (System)

4.4.5.1 Description:

The system administrator may establish system-wide alarm notifications through Customer Database Programming for various desired events. There are eight (8) system alarms times that are maintained in the Database Programming. These alarms occur continuously, for the desired times, seven days a week. For instance, if a system alarm is set once for 12:00PM (lunch break), this alarm will occur every day at 12:00PM and does not have to be re-programmed for the following day. The alarm alerting is actually a one minute period of Background Music played over every station's speaker.

4.4.5.2 Default: Empty

4.4.5.3 Related Feature(s):

Music On Hold
Background Music

4.4.5.4 Related Programming:

Attendant System Mode - Time

Notes:

a. An external music source is required for this operation. The same music source used for Background Music is applied to the System Alarm Clock.
b. Stations monitoring BGM will not realize any change when a System Alarm is reached.
c. If a station user is on a call (using the handset or speakerphone) during the alarm period, or in Do-Not-Disturb (DND) mode, the music alarm will not play at that busy station.
d. Alarm sound is reset at station if station goes off hook and back on hook.

4.4.6 Alpha-Numeric Display

4.4.6.1 Description:

The Executive Digital Key Telephone provides a two line Super Twist LCD that supports thirty-two (32) alpha-numeric characters. Super Twist technology provides greatly enhanced viewing from most viewing angles and eliminates the need for contrast adjustment. The LCD is very useful for sending and receiving outgoing and Executive Notify messages. Since user names may be programmed in the system, the display will help identify incoming callers by displaying the user's name instead of a station directory number. Any LCD equipped key telephone may be used for System Database Programming.

The LCD is interactive and will prompt the user with various choices concerning call set-up, handling and completion. The LCD provides help screens for feature button programming, password and security control, and status of incoming calls. All messages, call status, operation prompts and related indications will be displayed in a logical, preset order and priority.

The LCD is complemented by three (3) dynamic soft buttons that support the various interactions between the user and system. The LCD type is super-twist and provides superior viewing at most angles. Every Executive Key Telephone that has an LCD also has twenty (20) programmable feature buttons and speakerphone.

Notes:

a. Display messages each have their own display priority depending on various call/feature operations.
b. The message with the highest priority will be displayed on the LCD at any time.
c. In reference to the time and date message display, the station number or station name will be displayed in the Day service mode; otherwise, the message "night" will be substituted, indicating Night service mode.

4.4.6.2 Alternate Answering Position (Overflow Attendant)

4.4.6.3 Description:

A second station can be programmed as the alternate attendant. The alternate answering position serves as a back-up position to the primary attendant. CO ringing will forward to the alternate answering position after the preprogrammed Ring Alternate Position time.

4.4.6.4 Related Feature(s):

Recall

4.4.6.5 Related Programming:

CALL HANDLING -RING ALTERNATE POSITION
RESOURCE - ALTERNATE

Notes:

a. Any incoming CO line call ringing more than the programmed Ring Alternate Position time will also ring the overflow attendant, automatically.
b. Any key telephone may serve as the Alternate Answering Position.
c. CO lines that are recalling a the attendant position following a transfer operation will not be directed to the Alternate Answering Position.

4.4.7 Attendant

4.4.7.1 Description:

One primary attendant is provided in the system for support of necessary services like Line Recall, Forced Incoming ICM Call Forward and manual night service operation.

A second, or alternate, attendant position may be established for common sharing of incoming CO calls or load sharing during peak traffic periods. The attendant position may be occupied by any key telephone type. However, maximum efficiency is gained by use of an Executive Key Telephone, since call handling is enhanced by use of system prompts and messages.

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. The attendant will receive all intercom calls directed to the Attendant Directory Number, as programmed. The attendant station may be connected to any one system station port and be assigned any two-digit ICM station number in the system dialing directory.

One valid station number must be assigned to serve as the attendant. The customer may assign any one station as the attendant through database programming.

4.4.7.2 Related Feature(s):

Do Not Disturb (i.e. Forced DND)
System Service Mode
Time Of Day
System Speed Dial
User Password (F97)
Intercom Call Attendant

4.4.7.3 Related Programming:

RESOURCE - ATTENDANT
CALL HANDLING - OPERATOR CODE
Attendant Administration (F#0)
User Password (F97)

Notes:

a. 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).
b. Station 10 is the default Attendant Position.
c. Station 10 is assigned CO line ringing for all CO lines at default.

4.4.8 Attendant Administration FEAT # 0 OPER

4.4.8.1 Default Setting: 0000

4.4.8.2 Related Feature:

Night Service
System Speed Dial
Toll Restriction
DISA
Time of Day, Date settings

4.4.8.3 Related Programming:

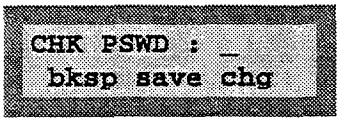
STATION PASSWORD
ATTENDANT STATION PROGRAMMING

4.4.8.4 Description: [Executive Model only]

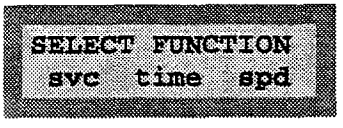
Attendant Administration is used to set the features; Service Mode (Day/Night/Time), System Date and Time, and System Speed Dial. You may enter into Attendant Administration using the password of the assigned system Attendant telephone.

4.4.8.5 Operation:

1. Press FEAT.
2. Dial # 0 OPER. The display shows:



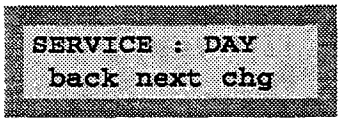
3. Dial the password.
4. Press "**save**". The display shows:



5. You have three (3) programming choices:

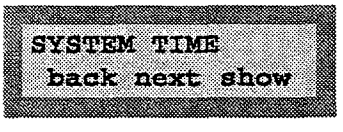
- System Service Mode

a. Press "**svc**". The display shows:



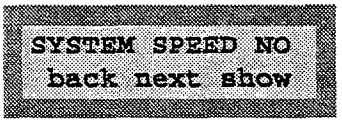
- System Date and Time

b. Press "**time**". The display shows:



- System Speed Dial Numbers

c. Press "**spd**". The display shows:



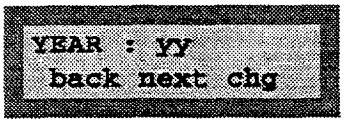
4.4.8.5.1 System Service Mode

6. Press "**chg**" to select between DAY, NITE, and TIME.
7. Press CLEAR to exit programming or "**back**" to change other features.

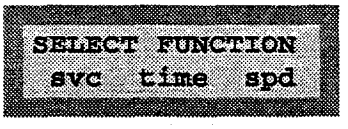
4.4.8.5.2 System Date and Time

6. Press "**show**". The display indicates:

7. If the year is correct press "**next**".

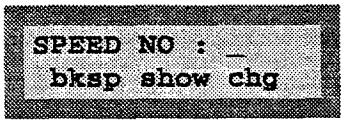


8. If you are programming a new year, dial the numbers for the current year.
9. Press "**save**".
10. Press "**next**" to continue programming System Date and Time.
11. Press "**back**" or "**next**" to return to the main Attendant Administration menu. The display will show:

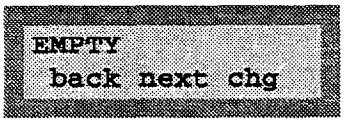


4.4.8.5.3 System Speed Dial

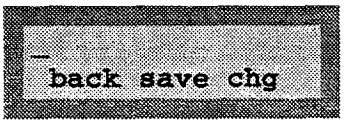
6. Press "**show**". The display will show:



7. Dial the System Speed Dial bin number (20-99) to be changed.
8. Press "**show**". The display will show the contents of the speed bin:



9. Press "**chg**". The display will show:



10. Dial the numbers to be stored in the bin.
11. Press "**save**".
12. Press "**back**" to return to Step 7 and continue programming speed dial numbers or press "**next**" to return to the main menus or press "**chg**" if the speed dial number was incorrectly dialed.

Notes:

a. Press CLEAR at any time to exit the programming mode.
b. The Attendant Administration code may be programmed on any programmable feature button.

4.4.9 Authority Code FEAT 5 JKL 5 JKL

4.4.9.1 Default Setting: 0000

4.4.9.2 Related Feature:

Class Of Service

4.4.9.3 Related Programming:

STATION - DAY/NITE COS
RESTRICTION - CO LN CALL DISCRIMINATION

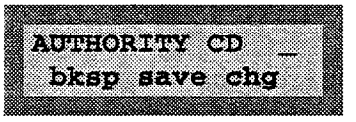
4.4.9.4 Description:

This feature is also known as Traveling Class of Service (COS). If you have extended dialing privileges, you may access your same COS at a telephone without extended dialing privileges. Long distance and restricted CO line calls can be made from telephones that are normally restricted.

4.4.9.5 Operation:

At the telephone without extended dialing privileges:

1. Press FEAT.
2. Dial 5 JKL 5 JKL. An Executive Telephone will display:



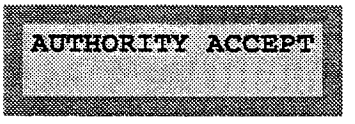
3. Dial your station number.

4.4.9.5.1 Basic and Enhanced Telephones

4. Dial your password. You may now dial according to your COS.

4.4.9.5.2 Executive Telephone

4. Press "**save**".
5. Dial your password.
6. Press "**save**". The display shows:



You may now dial according to your COS.

Notes:

a. When setting COS Roaming, the temporary COS accessed will be effective for one (1) minute before the original station COS is restored.

b. Features and programming such as line access/ring/receiving assignment are not transferred with temporary COS use.

4.4.10 ‡ Automatic Busy Redial FEAT 7 PRS 8 TUV

4.4.10.1 Default Setting: N/A

4.4.10.2 Related Feature(s):

None

4.4.10.3 Related Programming:

CALL HANDLING - AUTO BUSY REDIAL - ABR ATTEMPTS
CALL HANDLING - AUTO BUSY REDIAL - ABR INTERVAL

---

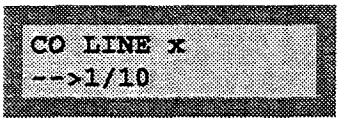
‡ ABR requires the Option Module for operation.

4.4.10.4 Description:

Automatic Busy Redial (ABR) may be used to dial the last number dialed. 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 number of attempts designated in programming is reached.

4.4.10.5 Operation:

1. Press FEAT.
2. Dial 7 PRS 8 TUV. An Executive Telephone will display:



(1/10 represents the first attempt of ten total attempts).

Notes:

a. 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.

b. The ABR feature only operates when the Option Module is installed.

4.4.11 Automatic Hold FEAT 9 WXY 4 GHI

4.4.11.1 Default Setting: Disabled

4.4.11.2 Related Feature(s):

Call Transfer
Direct Station Selection
Exclusive Hold

4.4.11.3 Related Programming:

CALL HANDLING - REMIND TIME
CALL HANDLING - RECALL TIME

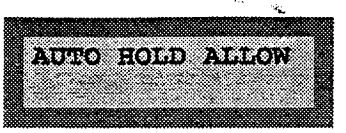
4.4.11.4 Description:

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, if you 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.

4.4.11.5 Programming:

1. Press FEAT.
2. Dial 9 WXY 4 GHI. Automatic Hold is now enabled. An Executive Telephone will display:



Use Steps 1 and 2 above to also disable the feature. An Executive Telephone will display "AUTO HOLD DENY" when you disable the feature.

4.4.11.6 Operation:

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.

Notes:

a. If you access an idle line and skip to another line before dialing, the first line will not be automatically placed on Hold.

b. The Automatic Hold feature places a call on Exclusive Hold.

c. If you have the Automatic Hold feature programmed on a feature button, the feature button lamp will light when the feature is enabled.

4.4.12 Automatic Line Selection FEAT 9 WXY 5 JKL

4.4.12.1 Default: Enable Intercom

4.4.12.2 Related Feature(s):

Private Line
Ringing Line Preference

4.4.12.3 Related Programming:

STATION - CO LINE ASSIGNM.
See Setup below

4.4.12.4 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.

4.4.12.5 Programming to Enable: Basic and Enhanced Telephones

1. Press FEAT.
2. Dial 9 WXY 5 JKL.
3. Dial the following codes to select the item you want the telephone to access automatically:

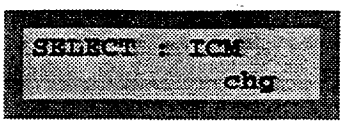
   0 - intercom

   1 - any outgoing line

   2 + x - any specific line, where "x" is that line (dial "0" for line 10, "*" for line 11, "#" for line 12).

4.4.12.6 Programming to Enable: <u>Executive Telephones</u>

1. Press FEAT.
2. Dial 9 WXY 5 JKL. The display will show:



3. Press the "**chg**" button to select between ICM, OUTG LN (any outgoing line), CO LN * (for each of the equipped lines).

4.4.12.7 Programming to Cancel: Basic and Enhanced Telephones

1. Press FEAT.
2. Dial * 9 WXY 5 JKL.

4.4.12.8 Programming to Cancel: Executive Telephones

Select "**EMPTY**" during Step 3 of the programming sequence.

Notes:

a. A line programmed for Automatic Line Selection must be programmed as available for access in the system programming.

b. When Automatic Line Selection is set to "EMPTY" you will not hear dial tone when you lift the handset or press SPKR.

c. The selection "OUTG LN" (for any outgoing line) is only available when the System Type is set for "PBX" in customer database programming.

4.4.13 Background Music FEAT 5 JKL 2 ABC

4.4.13.1 Default Setting: Disabled

4.4.13.2 Related Feature(s):

Alarm Clock - System
Music On Hold

4.4.13.3 Related Programming:

RESOURCE - BGM Y/N

4.4.13.4 Description:

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

4.4.13.5 Operation:

1. Press FEAT.
2. Dial 5 JKL 2 ABC.

Note:

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.

4.4.14 Battery Back-Up (Memory)

4.4.14.1 Description:

The system KSU is internally equipped with a rechargeable Ni-Cad battery for maintaining volatile system database programming and station programming during commercial AC power interruption. The memory

back-up will maintain the database programming, time and date displays, personal speed dial numbers, feature button programming, etc. for up to seven (7) days of continuous AC power loss. When system AC power is restored, the system will resume operation and the memory battery will be recharged. A discharged battery can require up to 14 hours to reach a fully charged condition.

During AC power interruption, the system will not operate unless System Battery Back-Up is equipped.

When the initialization switch on the CPU Module is operated to the "OFF" position, with the KSU AC power turned off, the Ni-Cad battery is removed from the volatile memory and the system is initialized with a factory configured default program.

4.4.15 Battery Back-Up (System)

4.4.15.1 Description:

External batteries may be connected to the KSU via the optional Starplus® VC61101 Battery Back-up Unit (BBU). This unit may be equipped with batteries sized to meet the particular customer requirements. The approximate time, in back-up hours, is located in the Battery Sizing chart in the Installation section. In the event of a commercial power outage, the BBU will provide the necessary system voltage (24 volts) 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. This threshold is approximately 21 volts to 21.5 volts.

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
- For further information, see Specifications and Installation sections.

4.4.16 Busy Lamp Field

4.4.16.1 Description:

Depending on user requirements, any Programmable Feature Button can be programmed as a BLF button to monitor a station's status. When the programmed station is off hook or in Do-Not-Disturb, 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.

4.4.16.2 Related Feature(s):

Direct Station Selection
Do Not Disturb
Programmable Feature Buttons

4.4.16.3 Related Programming:

None

4.4.16.4 Operation:

The ICM call and DND status for each station is indicated by the red LED associated with the programmed feature button at the key telephone. This same BLF button can be used for one-button ICM calling (DSS) to a specific station.

Note: Each station has a default feature button mapping, refer to the Configuration & Specifications section to determine the default map of the telephone models.

4.4.17 Call Back FEAT 9 WXY 1

4.4.17.1 Default Setting: N/A

4.4.17.2 Related Feature(s):

ICM Ring & Voice Call Interchanging (*)
Direct Station Selection
Voice Announce Handsfree

4.4.17.3 Related Programming:

None

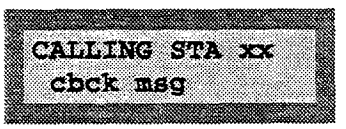
4.4.17.4 Description:

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.

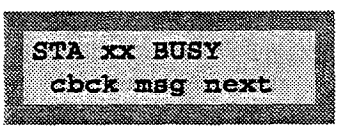
When the Call Back process begins you will hear bursts of tone signaling you to pick up the handset or press SPKR. Then the queued station begins ringing.

4.4.17.5 Operation:

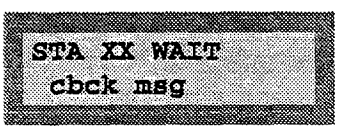
1. Call the station that you want to queue. An Executive Telephone will display the following according to the status of the telephone you are calling:



Station you are calling is in Tone Ringing mode.



Station you are calling is busy.



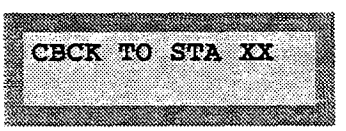
Station you are calling is busy with Call Wait enabled.

4.4.17.5.1 Sending a Call Back: Basic and Enhanced Telephones

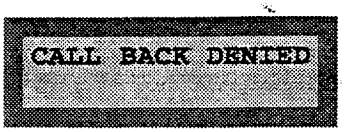
2. Press FEAT
3. Dial 9 WXY 1.

4.4.17.5.2 Sending a Call Back: Executive Telephones

2. Press "**cbck**". The display will show either:



OR

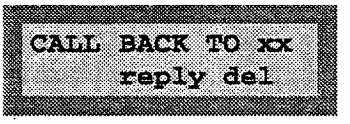


4.4.17.5.3 Answering a Call Back: Basic and Enhanced Telephones

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

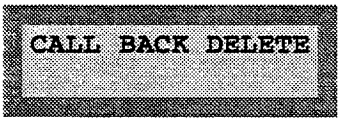
4.4.17.5.4 Answering a Call Back: Executive Telephones

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



2. Lift the handset or press SPKR.
3. Press "**reply**" to continue the Call Back. The display will show:

If you press "**del**" in Step 3 the Call Back will be canceled and the display will show:



You will hear ringback tone as the called station begins to ring.

4.4.17.6 To Cancel a Call Back:

1. Press FEAT
2. Dial * 9 WXY 1.

Notes:

a. The station you are calling must be busy, in DND, or in the Tong Ringing mode.

b. 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.

c. To invoke Call Back at a station in Voice Call Allow mode you must first Force Tone Ringing.

d. 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**".

e. The Call Back process begins when both your telephone and the called party's telephone are hung up.

4.4.18 Call Forward FEAT 2 ABC

4.4.18.1 Default Setting: Call Forward is disabled at default.

4.4.18.2 Related Feature:

Do -Not-Disturb
Message Waiting

4.4.18.3 Related Programming:

STATION - CO RING ASSIGNMENT
STATION - RECEIVE ASSIGNMENT

4.4.18.4 Description:

There are many Call Forward choices:

- You can have your calls forwarded when your telephone is idle,
- You can have your calls forwarded when your telephone is busy,
- You can forward all your calls,
- You can use the "follow me" feature to receive calls at a temporary location. You can activate the feature remotely from another station.
- You can have your calls forwarded when there is no answer.
- You can combine the busy and no answer call conditions for forwarding calls.

Intercom calls, incoming CO and transferred CO calls may be forwarded.

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.

4.4.18.5 Programming: Basic and Enhanced Telephones

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

Idle Call Forward - FEAT 2 ABC 0 OPER + station number

Busy Call Forward - FEAT 2 ABC 1 + station number

All Call Forward - FEAT 2 ABC 2 ABC + station number

Follow Me Call Forward - FEAT 2 ABC 3 DEF + station number + password

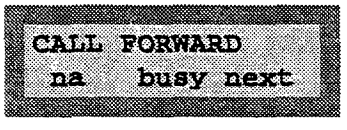
No Answer Call Forward - FEAT 2 ABC 4 GHI + station number + x

Combined Busy/No Answer - FEAT 2 ABC 5 JKL + station number + x

("x" = 0,1,2,3 or 4 where 0=10 seconds, 1=20 seconds, 2=30 seconds, 3=40 seconds, and 4=50 seconds).

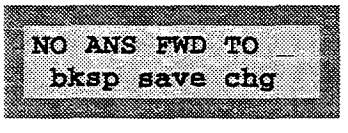
4.4.18.6 Programming: Executive Telephone

1. Press FEAT.
2. Dial 2 ABC. The display shows:



No Answer Call Forward:

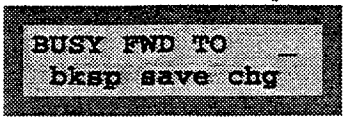
3. Press "**na**". The display will show:



4. Dial the station number where calls will be forwarded then press "**save**".

Busy Call Forward:

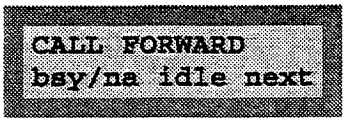
3. Press "**busy**". The display shows:



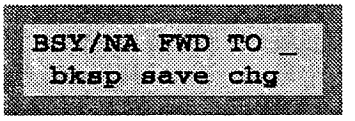
4. Dial the station number where calls will be forwarded then press "**save**".

Busy/No Answer Call Forward:

3. For more forward options press "**next**". The display shows:



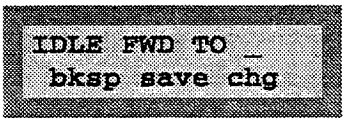
4. Press "**bsy/na**". The display shows:



5. Dial the station number where calls will be forwarded then press "**save**".

Idle Call Forward:

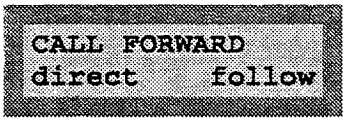
4. Press "**idle**". The display shows:



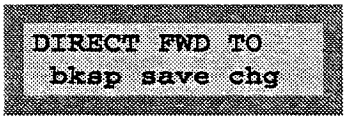
5. Dial the station number where calls will be forwarded then press "**save**".

Direct (All Call) Forward:

4. For more forward options press "**next**". The display shows:



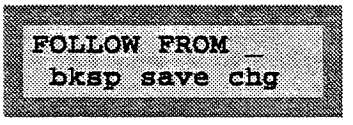
5. Press "**direct**". The display shows:



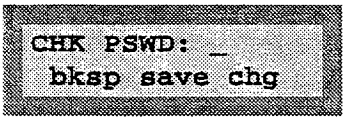
6. Dial the station number where all calls will be forwarded then press "**save**".

Follow Me Call Forward:

5. Press "**follow**". The display shows:

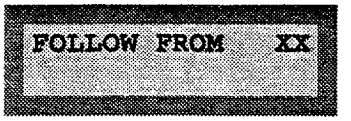


6. Dial the station number from which calls are to be forwarded.
7. Press "**save**". The display shows:



8. Dial the password for that station.

9. Press "**save**". The display will momentarily display the following message while confirmation tone is heard.



If the station identified is in Do Not Disturb or has messages waiting, Follow Me Call Forward will not be allowed and the message "OUT OF SERVICE" will be displayed:

4.4.18.7 To Cancel Call Forward:

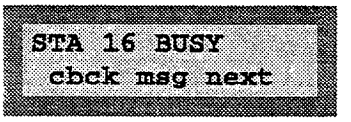
Any call forward mode can be canceled at the station that is forwarded by pressing FEAT 2 ABC. The display will indicate "DELETE FORWARD". (See note "n" below.)

4.4.18.8 Operation:

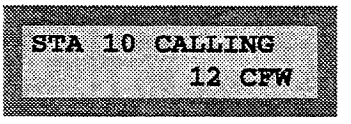
Let's assume that you are Station 10 and Station 12 is Busy Call Forwarded to Station 16.

1. Call Station 12, which is busy on another intercom call.
2. Your call is forwarded to Station 16 and you hear ringback tone. At an Executive Telephone, your display shows:

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



4. At Station 16 ringing is heard and the display reads:



Notes:

a. Call Forward can be pre-programmed on any feature button.

b. When active, the lamp on the assigned CALL FORWARD button will light. On an Executive Key Telephone, the display will also indicate that the feature is active and what station is assigned to receive the incoming calls.

c. When Call Forward is active at any telephone, Special (stutter) Dial Tone is heard when the user accesses intercom dial tone.

d. Call Forward can't be activated at a telephone in Do Not Disturb (DND). If DND is currently active you will hear error tone and the display on an Executive Telephone will show "RELEASE DND".

e. Only one type of Call Forward can be active at a station at any time.

f. If Call Forward has been enabled, the original Call Forward setting will be deleted prior to new Call Forward programming.

g. Call Forward, Do Not Disturb, and Message Waiting are mutually exclusive. Only one of these three features may be active at the same time.

h. After programming Call Forward, the Call Forward message will be displayed depending on its specific display priority.

i. Call Forward cannot be programmed for more than three (3) stations in series. For instance, if Station A forwards to Station B and Station B forwards to Station C, Station C cannot forward calls.

j. Any number of stations may be programmed for Call Forward to the same destination, simultaneously.

k. All Call Forward will forward all intercom calls, regardless of busy/idle state.

l. 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.

m. Follow Forwards must be canceled at the station from where calls were forwarded.

4.4.19 Caller Identification

4.4.19.1 Default Setting: N/A

4.4.19.2 Related Feature:

Alpha-numeric display
Call Transfer

4.4.19.3 Related Programming:

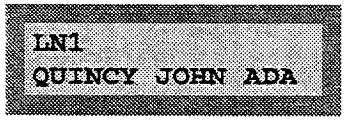
CO LINE - ICLID PORT#
CALL HANDLING - WAIT-ICLID

4.4.19.4 Description: [Executive Model Only]

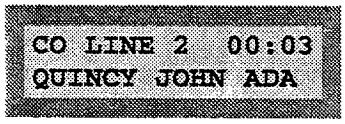
Incoming Caller Identification is facilitated by the local telephone company that provides telephone line service. When properly equipped the Starplus DHS will display this caller ID information when delivered from the telephone company. Executive telephones that are assigned to ring for this incoming line will display the caller data while the call is ringing.

4.4.19.5 Operation:

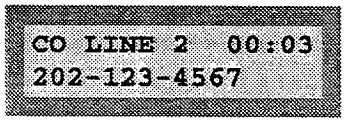
When equipped, Caller ID is automatic. In the following example the caller name is John Quincy Adams. Since the telephone company can only provide 15 characters for any caller's name the likely resulting display would be:



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



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.



When the name is displayed the Starplus DHS 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. (Important: no soft button prompt is present in the display since the area above all Soft buttons is filled with caller ID data.) The current Caller ID mode is changed with each depression of the right Soft Button.

Notes:

a. Caller ID data is also output to a SMDR (Station Message Detail Recording) device when equipped.

b. The right Soft Button may be used to select caller data to display. (Name/Number)

4.4.20 Caller ID - Unanswered Call Table FEAT * 9 WXY

4.4.20.1 Default Setting: Empty

4.4.20.2 Related Feature:

Incoming Caller Identification

4.4.20.3 Related Programming:

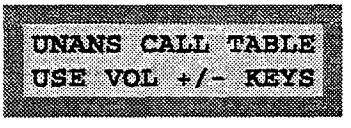
RESOURCE - ATTENDANT

4.4.20.4 Description: [Executive Model Only]

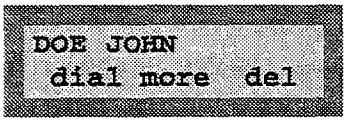
Caller Identification information for one-hundred (100) unanswered calls is stored in an Unanswered Call Table. While reviewing the unanswered calls you will have the option to dial a number, obtain more information for a particular call, delete a call, etc.

4.4.20.5 Operation:

1. Press FEAT.
2. Dial # 9 WXY. The display will show

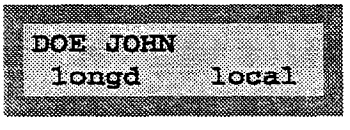


3. Press either the volume up or volume down button to begin reviewing calls.



4.4.20.6 To Dial the Name/Number Displayed (long distance call):

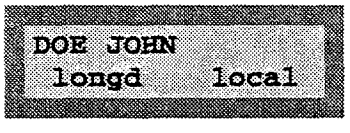
4. Press "**dial**".



5. Press "**longd**". The number "1" will be dialed followed by the telephone number.

4.4.20.7 To Dial the Name/Number Displayed (local call):

4. Press "**dial**".



5. Press "**local**". The area code will not be dialed.

4.4.20.8 To Review Additional Information for a Call:

4. Press "**more**". Continue pressing the button to review information such as the telephone number of the caller, the date and time of the call, and the name of the caller).

Notes:

a. You can press CLEAR at any time to exit the Caller ID Unanswered Call Table mode.

b. Any Executive telephone user can review the Caller ID Unanswered Call Table, but the table can reviewed by only one telephone at a time.

4.4.21 Call Operator 0 OPER (Call Attendant)

4.4.21.1 Description:

The station that is programmed as the attendant may receive intercom calls by a one-digit code. The Call Operator code is programmable as either 0 or 9. The code is in addition to the assigned two-digit intercom number for the station. The attendant two-digit station number can be assigned to any feature button.

4.4.21.2 Related Feature:

SLT CO Line Group Access

4.4.21.3 Related Programming:

CALL HANDLING - OPERATOR CODE
RESOURCE - ATTENDANT

4.4.21.4 Operation:

Any station accesses the intercom and dials 0 OPER.

Notes:

a. One station must be assigned as the attendant.
b. The code to call the operator is programmable, either 0 or 9. (At default the code is "0".)
c. The Operator Code is mutually exclusive with the SLT CO Line Access Code (0 or 9).
d. At default station 10 is designated as the primary attendant.

4.4.22 Calling Party Identification

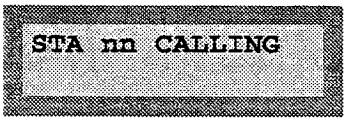
4.4.22.1 Description:

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.

4.4.22.2 Operation:

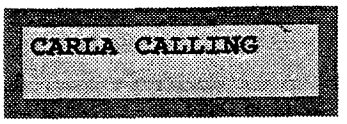
At an Executive Key Telephone place an intercom call to station xx. As ringback tone is heard the following display is seen:

At the Executive Key Telephone receiving this intercom call the following message is displayed:



Internal ring, the calling party's number "nn" is displayed.

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



4.4.23 Call Park FEAT 7 PRS 3 DEF

4.4.23.1 Default Setting: N/A

4.4.23.2 Related Feature:

System Hold
Call Park Answer

4.4.23.3 Related Programming:

CALL HANDLING - PARK REMIND

4.4.23.4 Description:

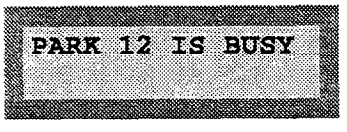
This feature allows you to have calls parked at your telephone that can be retrieved from any telephone in the system. Calls are parked and retrieved by dialing the Call Park code followed by the pre-assigned station number.

4.4.23.5 Operation: During a call on Line 1:

1. Press FEAT.
2. Dial 7 PRS 3 DEF. At an Executive Telephone the display will show:

3. Dial the station number. For example, if station 12 is dialed the display at an Executive Telephone will show:

If a call is currently parked at station 12 the display will show:



Notes:

a. Each telephone/station has one personal station number used to park one CO line call.
b. From your telephone you can park a call at any station number, even if a key telephone is not assigned to that park number.
c. The Call Park feature code may be programmed on any programmable feature button.
d. Calls can be retrieved from any station, regardless of model or button assignments.
e. CO lines that have been parked are on System Hold and may be accessed by any station.

4.4.24 Call Park Answer FEAT 7 PRS 3 DEF

4.4.24.1 Default Setting: N/A

4.4.24.2 Related Feature:

System Hold
Call Park

4.4.24.3 Related Programming:

CALL HANDLING - PARK REMIND

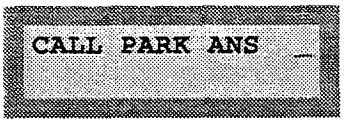
4.4.24.4 Description:

You may retrieve a parked call by using one of three methods:

1. Dial FEAT 7 PRS 3 DEF followed by the associated station number, or
2. Dial FEAT 7 PRS 3 DEF followed by the CO line number in two-digit format (01-12), or
3. Press the flashing CO line button (if the CO line for the parked call appears on the telephone).

4.4.24.5 Operation:

1. Press FEAT.
2. Dial 7 PRS 3 DEF. At an Executive Telephone the display will show:



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

Notes:

a. 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.
b. 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 the call on hold and retrieve the call from hold.
c. The Call Park Answer feature code may be programmed on any programmable feature button.

4.4.25 Call Pick Up (Direct/Group) FEAT 5 JKL 3 DEF / FEAT 5 JKL 4 GHI

4.4.25.1 Default Setting: All Stations are members of Station Group 1.

4.4.25.2 Related Feature:

Station Group
Call Transfer

4.4.25.3 Related Programming:

STATION - STA GROUP

4.4.25.4 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 dialing the station number of the ringing station. Group Call Pick Up allows you to retrieve calls within the same station group. See STATION Groups.

If multiple calls are ringing at a station a priority list (shown below) determines which call will be answered first.

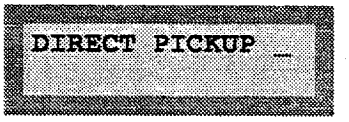
Call Pick Up Priority List

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.

4.4.25.5 Operation - Direct Call Pick Up:

1. Press FEAT.
2. Dial 5 JKL 3 DEF. An Executive Telephone will display:



4.4.25.6 Operation - Group Pick Up:

1. Press FEAT.
2. Dial 5 JKL 4 GHI.

Notes:

a. If the call at the dialed station has stopped ringing, you will hear error tone and the display on an Executive Telephone will show "PICKUP FAILURE".

b. A station that doesn't have the outside line appearing on a button or doesn't have CO Line Receive programmed may still answer the ringing line by the Call Pick Up procedure.

c. The Call Pick Up feature code may be programmed on any programmable feature button.

4.4.26 Call Waiting FEAT 6 MNO 8 TUV

4.4.26.1 Default Setting: Disabled

4.4.26.2 Description: [Executive Model only]

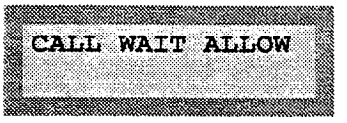
You will hear one burst of warning tone through the speaker whenever an inside caller is waiting and this feature is enabled. You may accept or reject the call using the display soft buttons.

This feature affects the Voice Over Busy feature. When you prefer off-hook tone signaling, activate the Call Waiting feature to prevent inside parties from invoking the Voice Over Busy feature (unless there is another ICM call currently waiting for the same station).

4.4.26.3 Programming:

You may enable Call Waiting at any time.

1. Press FEAT.
2. Dial 6 MNO 8 TUV. The display will show:

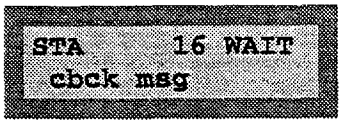


Follow Steps 1 and 2 above to also disable the feature. The display will show "CALL WAIT DENY".

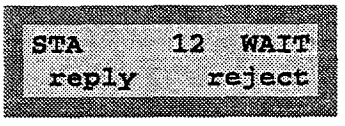
4.4.26.4 Operation:

Let's use Stations 12 and 16 as an example. While Station 16 is busy:

1. Station 12 makes an intercom call to Station 16.
   - Station 12 hears ringback tone and the display shows:



   - Station 16 hears one ring tone and the display shows:



2. Station 16 can either reply or reject the call:

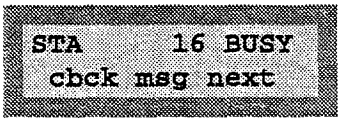
To Reply:

- Press "**reply**". The display at Station 16 shows:

- The original call at Station 16 is placed on Hold automatically if Auto Hold Allow is enabled.
- The display at Station 12 shows:

To Reject:

- Press "**reject**". Station 12 hears busy tone and the display shows:



Notes:

a. If a feature button is programmed for Call Wait Allow, the programming status of this feature will be indicated on its associated red lamp. A steady red light indicates that the feature has been enabled.
b. Call Waiting does not operate when the called station is dialing or no longer connected to a call but has not yet hung up.
c. The Call Waiting feature code may be programmed on any programmable feature button.

4.4.27 Camp On (Busy Station)

4.4.27.1 Default Setting: N/A

4.4.27.2 Description:

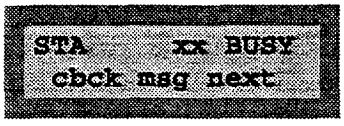
Camp-On is used to privately alert a busy station for immediate consultation. Camp-On alert tone is heard at the busy station every 30 seconds as a reminder. The party currently speaking with the busy station does not hear the tone.

4.4.27.3 Operation Basic and Enhanced Telephones:

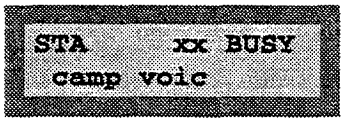
1. While listening to busy tone after calling a station dial 2 ABC.

4.4.27.4 Operation Executive Telephone:

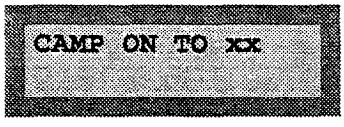
While listening to busy tone after calling a station the display will show:



1. Press "**next**". The display will show:



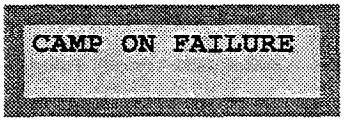
2. Press "**camp**". The display will show:



You will hear 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.

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



Note:

Each station can have only one Camp On at the same time.

4.4.28 Camp On (Busy CO Line) FEAT 9 WXY 3 DEF

4.4.28.1 Default Setting: N/A

4.4.28.2 Related Feature:

Privacy Release

4.4.28.3 Related Programming:

STATION - RECEIVE ASSIGNMENT

4.4.28.4 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.

4.4.28.5 Operation:

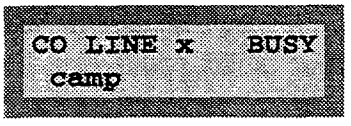
To Activate: <u>Basic and Enhanced Telephones</u>

1. Press the busy line button. You will hear busy tone.
2. Press FEAT.

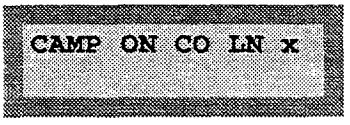
3. Dial 9 WXY 3 DEF. You will hear error tone if the line is already camped-on. You will hear ringing when the line becomes available and the lamp for the line will flash.
4. Press the line button or lift the handset.

To Activate: Executive Telephone

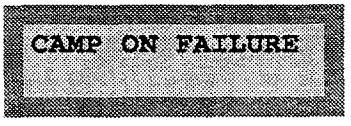
1. Press the busy line button. The display shows:



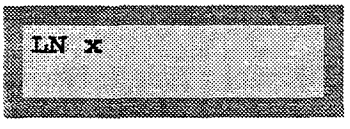
2. Press "**camp**". The display shows:



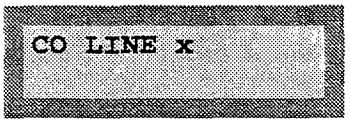
If the line is already camped-on the display shows:



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

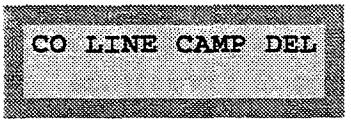


3. Press the line button or lift the handset. The display shows:



To Cancel:

1. Press FEAT.
2. Dial 9 WXY 3 DEF. At an Executive Telephone the display will show:



Notes:

a. Every CO line can be camped by only one station at the same time.
b. Every station can camp only one busy CO line at the same time.
c. 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.
d. 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 doesn't answer within 30 seconds.
e. 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.
f. 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.

4.4.29 Class Of Service (Day/Night)

4.4.29.1 Description:

The system provides eight (8) Classes of Service (COS) 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 COS.

System Speed Dial is specially linked with Class of Service such that all speed dial bins override toll restriction programming in the toll restriction tables. It should be noted that stations assigned COS 0-5 have access to all System Speed Dial Bins (20-99). 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 Privacy Release. Stations with equal or greater levels of COS may join a busy CO line conversation when Privacy Release is enabled. For example, a station assigned COS 1 may join a CO line conversation with a station assigned COS 1 or lower.

Note: the highest level COS is 0 and the lowest COS level is 7.

4.4.29.2 Related Features:

System Speed Dial
Do-Not-Disturb
Override
Privacy Release

4.4.29.3 Related Programming:

STATION - DAY/NITE COS
RESTRICTION - CO LN CALL - DISCRIMINATION

4.4.29.4 Operation:

Station COS is assigned in Database 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.

4.4.30 Clear CLEAR

4.4.30.1 Default Setting: N/A

4.4.30.2 Description:

Press the CLEAR button to hang up the telephone. The button is also used to clear a previous operation or exit the programming mode.

Note: Used in conjunction with the Headset Mode and the SPKR button, the CLEAR button may be used to cancel and disconnect calls, whereas, the SPKR button becomes an "answer" button.

4.4.31 CO Line Group Assignment

4.4.31.1 Description:

The system provides four (4) 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 two-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.

4.4.32 CO Line Interface

The system provides loop start CO line interface with built-in gas over-voltage protection. Either pulse (rotary) or DTMF signaling is provided. Abandoned call supervision is provided for all CO lines.

The maximum system configuration provides for either nine (9) CO lines or twelve (12) CO lines depending on the specific application requirements and the configuration. Refer to the Configuration section for more details.

4.4.33 CO Line Pool

4.4.33.1 Description:

The CO Line Pool assignment preserves feature buttons and reduces the number of individual CO line appearances required at a key telephone. The CO Line Pool allows random CO line outgoing access and becomes a virtual "answer" button, with illumination, for receiving incoming or transferred calls. A CO Line Pool button can be assigned to access CO Line Group 1, CO Line Group 2, CO Line Group 3, CO Line Group 4, or All CO Line Groups. Alternatively, CO Line Groups 1- 4 can be assigned to separate distinct feature buttons. If the system is installed as a key system, and not as a hybrid PBX, CO Line Pool buttons and CO Line Group access by code (dial "9") or button are not allowed.

Note: Certain states and telephone companies prohibit PBX-type equipment operation behind Centrex lines.

4.4.33.2 Related Features:

Programmable User Feature Buttons.

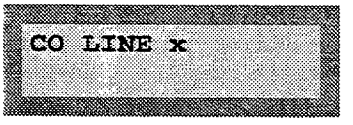
4.4.33.3 Related Programming:

CO LINE - CO LINE GROUP

4.4.33.4 Operation:

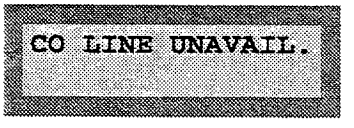
Press the Feature Button programmed for CO Line Group operation.

An idle CO line in the associated group will be accessed. (The last CO line in the group is always accessed first. When the feature button is programmed for All Group operation, the last CO line in the highest group number is accessed first.)



The Group button LED is green and blinking.

If CO Lines are camped-on by other key telephones or busy, busy tone will be heard and the display will show the following.



Notes:

a. Any Programmable Feature Button may be programmed as a CO Line Group button
b. If a station has multiple CO Line Group buttons programmed without any individual CO line buttons, Incoming calls will be indicated on only one idle CO Line Group button to which the CO line is assigned.

c. An incoming call can only be indicated on its associated CO Line Group button. For example, if CO Line 1 belongs to CO Line Group 1, its incoming status can be indicated either on CO Line Group 1 button or on general CO Line Group button, whichever is pressed.
d. If a station has group button and individual CO line button:
e. An incoming CO line call will be indicated only on an individual CO line button.
f. When pressing an individual CO line button, the LED indication on an assigned group button will not be affected.
g. Pressing an idle CO Line Group button to originate/answer a CO line call, will affect the LED indication of an individual CO line button, (i.e. CO line status will be indicated on both CO line group button and individual CO line button).
h. The LED indication on a CO line group button and an individual CO line button will be treated in the same way.
i. When all CO lines in a certain group are busy, any attempt to access an idle CO line by pressing the CO line group button will receive busy tone, and the system will assign any busy CO line for the station to establish Camp-On Busy CO Line.
j. Special Note: Even if a key telephone has no CO Line or CO Line Group buttons assigned, an outside CO line call can be transferred to the station. There will be no visible LED indication at the called station.

4.4.34 CO Line Signaling

4.4.34.1 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.

There are three (3) different Ring Schemes that can be selected in the customer database programming, which affect both CO Line and ICM ringing. See Ring Schemes for additional details.

4.4.34.2 Related Feature:

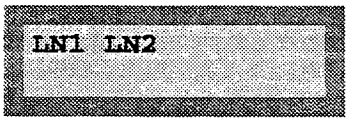
DND
Call Forward

4.4.34.3 Related Programming:

RING ASSIGNMENT
RECEIVE ASSIGNMENT

4.4.34.4 Operation:

There are incoming calls signaling on CO Line 1 and CO Line 2:



Notes:

a. Only those stations with corresponding CO Line ring and receive assignments will display the current incoming CO line call status. CO Line Receive must be enabled for the station.
b. 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 seconds, depending on the connected Central Office.
c. At default only the attendant is allowed to receive external CO line ring and can answer all incoming CO line calls.

4.4.35 CO Line Type Assignment

4.4.35.1 Description:

Each CO line can be assigned as "PBX CO Line" or "Open". The Open assignment is reserved for CO lines equipped on the system, but not connected to telephone company network facilities. The Open type indication alerts the system that this CO line shouldn't be used to place outgoing calls when system features are invoked which initiate automatic CO line selection.

The PBX CO Line type indication 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 that station's Class of Service. The programmed PBX Trunk access code also notifies the system that a pause should be inserted when re-dialing 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.

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.

4.4.35.2 Related Feature:

None

4.4.35.3 Related Programming:

CO LINE TYPE
PBX CODE

Note: At default CO Line Type is set to "CO" for all CO Lines.

4.4.36 Conference (Supervised) FEAT 6 MNO 0 OPER

4.4.36.1 Default Setting: N/A

4.4.36.2 Related Feature:

Hold

4.4.36.3 Related Programming:

CALL HANDLING - UNS CNF TIME
CALL HANDLING - UNS CONFERENCE

4.4.36.4 Description:

The system can accommodate eight (8), 4 member (party) conferences, simultaneously. Conference combinations may consist of 2 CO lines maximum and any number of stations to a maximum of 4 parties (members). One inside key telephone station is the controller of the conference and constitutes one conference member.

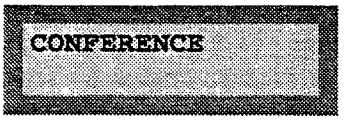
Note: Before a conference can be established with a maximum of 4 members, a 3-member conference must first be established.

4.4.36.5 Operation: To Establish a Conference:

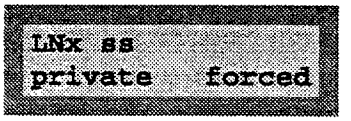
While on a line;

1. Press HOLD. The current call is placed on hold and intercom dial tone is heard.
2. Press another line button (or dial a DHS system station and go to step 4).
3. Dial the second party. (Repeat Steps 1-3 to add a third party).
4. To join the parties in a conferenc. Press FEAT.

5. Dial 6 MNO 0 OPER. The display shows:



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



4.4.36.6 Operation: To add a fourth party :

6. Press HOLD.
7. Dial the fourth party.
8. Press FEAT.
9. Dial 6 MNO 0 OPER.

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

4.4.36.7 To Force-Release - Basic and Enhanced Telephones:

1. Press FEAT.
2. Dial 7 PRS 4 GHI.
3. Dial the station number or press the line button to release.

4.4.36.8 To Talk Privately - Basic and Enhanced Telephones:

1. Press FEAT.
2. Dial 5 JKL 7 PRS.
3. Dial the station number or press the line button to talk privately.

4.4.36.9 Executive Telephone Forced Release/Talk Privately:

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

Notes:

a. 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.
b. 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.
c. When the controlling party exits a conference, the most recently invited internal party will be designated as the new controlling party.
d. Each of the calls involved in a holding conference will be placed on Exclusive Hold.
e. When a conference is established, each party will hear a burst of conference tone.
f. Any conference feature code may be programmed on any available programmable feature button.
g. Conference can only be established at a key telephone.

4.4.37 ‡ Conference (Unsupervised) FEAT 7 PRS 7 PRS

4.4.37.1 Default Setting: N/A

4.4.37.2 Related Feature:

Hold

4.4.37.3 Related Programming:

CALL HANDLING - UNS CNF TIME
CALL HANDLING - UNS CONFERENCE

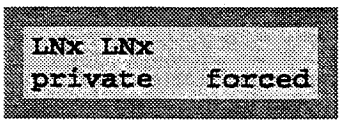
4.4.37.4 Description:

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.

4.4.37.5 Operation To Establish an Unsupervised Conference:

Two (2) CO lines are conferenced at your station:



1. Press FEAT.
2. Dial 7 PRS 7 PRS. At an Executive Telephone the following display will be seen momentarily.

If no further action is taken the display returns to idle status. At this time the two (2) lines are conferenced.

4.4.37.6 To Rejoin the Unsupervised Conference:

1. At your station, press FEAT.
2. Dial 6 MNO 0 OPER.

Note:

New conference parties may only be added when the conference controller is a member of the conference.

4.4.38 Database Programming FEAT # *

4.4.38.1 Description:

All customer unique database is entered from any Executive Key Telephone. During programming, incoming calls will still ring at the Executive Key Telephone being used as the program input device. It is very easy to exit the programming mode, answer the incoming call, and re-enter the programming mode without cumbersome database storage routines.

All customer database programming is battery protected in the event of system AC power loss. The Database Programming password is a six-digit, changeable number that is factory defaulted as (000000).

The customer specific database is entered during installation and affects overall system operation.

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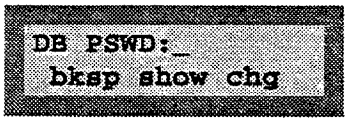
‡ Unsupervised Conference requires the Option Module for operation.

4.4.38.2 Operation:

Press the FEAT (Feature) button then dial # * on the dial pad



Enter the six-digit Password - ("000000" is default).

Press the center Soft Button corresponding to the "**show**" prompt on the display.

You are now at the beginning of Database Programming, "**SYSTEM TYPE**" for selecting Key System or PBX hybrid type operation. For detailed instructions concerning sub-categories and the sequence of programming exercises, refer to Database Programming.

Depending on the initial setup, the system may operate as a key system only according to the key system (KF) FCC Registration Number, or as a hybrid PBX system which requires the unique (MF) FCC Registration Number.

The selection of Key or PBX is made by the installing company and requires proper notification to the telco regarding the type of service to be provided by the local exchange carrier.

4.4.39 Dial Access To Feature FEAT

4.4.39.1 Description:

Most of the system provided features may be accessed by entering specific codes, if extra Feature buttons are not available or if some features are infrequently used. The Executive Key Telephone also provide visual prompts and "soft button" entry that eliminate the need to remember certain feature access codes or to unnecessarily assign these features to feature buttons.

All feature codes and certain fixed dual feature buttons (HOLD/EXCLUSIVE) are preceded by the FEAT button. Refer to the Programmable Feature Button section.

4.4.40 Dialing Type Selection

4.4.40.1 Description:

The dialing type for an outgoing CO line call can be selected through the Database Programming in the CO Line Programming category. The system will dial the telephone number in DTMF or Pulse (rotary) mode according to the programmed Dialing type selection of the associated CO line. Refer to the Database Programming section.

4.4.40.2 Related Feature:

CO line dialing

4.4.40.3 Related Programming:

CO LINE - DIALING

Note: At default all CO lines are assigned DTMF dialing.

4.4.41 Dial Intercom (Non-Blocking)

4.4.41.1 Description:

All intercom call are made by dialing the station's unique two-digit intercom number. If a station feature button is programmed as a DSS/BLF 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 Hands-free mode, Voice Announce Privacy mode, or Tone Ringing. The intercom calling station can force the called station

from Voice Announce mode to Tone Ring mode by dialing the asterisk * key after dialing the station number.

Intercom dial tone may be automatic upon lifting the handset or after pressing the SPKR (speaker) button, if enabled under the Auto Line Select (FEAT 9 WXY 5 JKL) station feature.

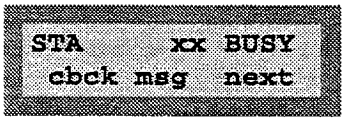
4.4.41.2 Operation:

To place an ICM call:

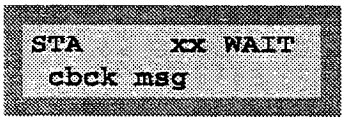
Dial the station number on the telephone dial pad.

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

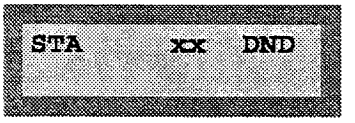
If the called station is busy. busy tone is heard.



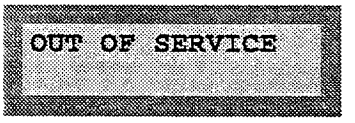
If the called busy station has Call Wait enabled, ringback tone is heard.



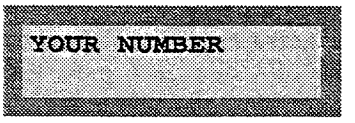
Various other displays and conditions:



...when the station is in DND.



...if the station number dialed is not connected.



...if the called station is your own station number.

Note:

Intercom calls to key telephones selected for Voice Announce - Hands-free or VA - Private (via code FEAT 9 WXY 8 TUV) are "logically" answered by the system at the called station.

4.4.42 Dial Pulse To DTMF Conversion

4.4.42.1 Description:

When making an outside call on a CO line with Pulse (Rotary) dialing, the digits following * will be sent in DTMF tone mode. Pulse-to-tone changeover can be programmed into any Speed Dial bin, if desired.

4.4.42.2 Related Feature:

System Speed Dial

4.4.42.3 Related Programming:

CO LINE - DIALING

4.4.43 ‡ Direct Inward System Access (DISA)

4.4.43.1 Default Setting:

Inactive for all CO lines

4.4.43.2 Related Feature:

System Speed Dial
Dial Intercom

4.4.43.3 Related Programming:

CALL HANDLING - DISA

4.4.43.4 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, Always).

Talk time can be manually extended by the outside DISA party.

There are 24 passwords available, each 4-digits in length. These passwords correspond to the system station numbers. Since your password is only 4-digits, caution should be exercised when permitting unauthorized use of the DISA facilities.

4.4.43.5 Operation:

Let's assume CO Line 1 is programmed for DISA operation.

When you call into CO line 1 your call is automatically answered and you will hear DISA dial tone.

4.4.43.6 Using DISA To Make a Station Call

When DISA dial tone is heard, dial the two digit station intercom number.

Note: If you do not dial the station number within the 10 second time-out period, your call will be transferred to the attendant station.

4.4.43.7 Using DISA To Call the Attendant

When the first dialed digit is the Operator Code, your call will be directly transferred to the attendant.

4.4.43.8 Using DISA To Access CO Lines:

When you hear DISA dial tone:

1. Dial #.

‡ DISA requires the Option Module for operation.

2. Dial one of the DISA passwords (24 possible).

3. Dial #.

Once your password is verified a second dial tone is presented. You may access three(3) types of features: speed dialing, CO line access, and intercom calling.

4.4.43.8.1 Using System Speed Dialing

4. Dial 1

5. Dial the System Speed Dial Bin (20-99).

The system will select an idle CO line and dial the stored speed dial number.

4.4.43.8.2 To Access a CO Line

4. Dial 2 ABC.

5. Dial a line number (1-12). (1 - 9 WXY = Line 1-9, 0 OPER = Line 10, * = Line 11, # = Line 12).

If the CO line selected is idle DISA will connect the line for dialing.

4.4.43.8.3 To Place an Intercom Call

4. Dial 3 DEF.

5. Dial the Station Number.

4.4.43.9 Disconnecting a CO Line DISA call:

6. Dial 0 OPER # .

Note: a programmed Talk Time will disconnect all DISA-CO Line calls when it expires.

4.4.43.10 To Extend the DISA Talk (Conversation) Time:

When the DISA call is in progress;

6. Dial 0 OPER * to extend the preset conversation time.

Notes:

a. The option board must be installed for DISA to function.

b. Two DISA CO lines may be used simultaneously. If more than two DISA CO lines are signaling for answer, the subsequent calls will receive internal busy tone.

c. The default Class of Service (COS) of day and night for DISA CO line is 0. Each DISA CO line has its own COS for dialing privileges.

d. DISA CO line (COS) assignment coincides with Toll Restriction COS Tables.

e. The activation time for a DISA CO line is programmable for "Never", Day", "Night" or "Always".

f. If you dial a station number which is non-existent your call will be directly transferred to the attendant.

g. The CO Line-to-CO Line Conference time is programmable for 1, 2, 3, 5, 10, and 15 minutes (default is 1 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.

h. System CO Line-to-CO Line Conference does not have to be enabled in Database Programming.

4.4.44 Direct Station Selection/Busy Lamp Field

4.4.44.1 Default Setting: N/A

4.4.44.2 Related Feature:

Call Transfer
Programmable Feature Buttons

4.4.44.3 Related Programming:

None

4.4.44.4 Description:

Any feature button may be programmed as a combination Direct Station Selection (DSS) and Busy Lamp Field (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.

Typically, the button is labeled with your name and/or your two-digit intercom number. Refer to Programmable Feature Buttons to assign a DSS button.

4.4.45 Distinctive Ringing (Station) FEAT # 7 PRS

4.4.45.1 Default Setting: Ringing Tone 1

4.4.45.2 Related Feature:

Distinctive Ringing

4.4.45.3 Programming:

RESOURCE - RING SCHEME

4.4.45.4 Description:

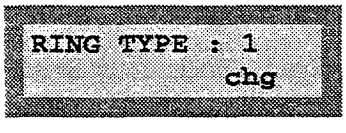
You may choose from four distinctive ringing tones to signal incoming calls. This allows you to easily distinguish your calls from calls ringing at other stations near you.

4.4.45.5 Programming: Basic and Enhanced Telephones

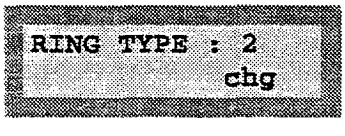
1. Press FEAT.
2. Dial # 7 PRS.
3. Dial a ringing tone code (1-4).

4.4.45.6 Programming: Executive Telephone

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



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



Note:

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

4.4.46 Do Not Disturb (DND) FEAT 4 GHI

4.4.46.1 Default Setting: Disabled

4.4.46.2 Related Feature:

Call Forward
Call Wait
Dial Intercom
DND Override
Forced Intercom Call Forward

4.4.46.3 Related Programming:

None

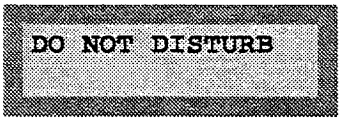
4.4.46.4 Description:

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 higher Class Of Service may override a station's DND condition.

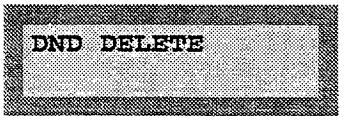
When you have activated DND you will hear special intercom (stutter) reminder tone when you lift the handset or use the speakerphone. If you have assigned a button on your telephone specifically for DND, that button will light whenever you activate the feature.

4.4.46.5 Operation:

1. Press FEAT.
2. Dial 4 GHI. You will hear confirmation tone and an Executive Telephone will display:



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



Notes:

a. Do Not Disturb cannot be enabled if you have activated Call Forward.
b. 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.
c. Your DSS/BLF button on other key telephones will flash when you activate DND.
d. The DND feature code may be programmed on a programmable feature button.

4.4.47 DND Override

4.4.47.1 Default Setting: N/A

4.4.47.2 Related Feature:

Do Not Disturb

4.4.47.3 Related Programming:

STATION - DAY/NITE COS

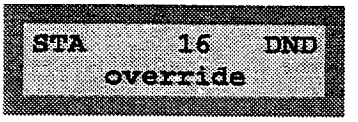
4.4.47.4 Description: [Executive Model only]

If you have an Executive Telephone you may override a station in DND if your Class Of Service is higher. When you override a station in DND that station will hear tone ringing.

4.4.47.5 Operation:

Let's assume Station 16 is in DND:

1. Call Station 16. You will hear DND tone and your display will show:

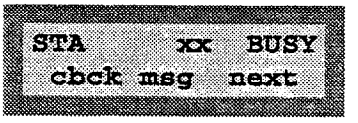


The Override option is displayed only if your COS is higher than Station 16's COS.

2. Press "**override**". If Station 16 is idle your display will show:

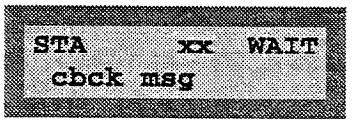
OR

If Station 16 is busy your display will show:



OR

If Station 16 is busy with Call Wait enabled your display will show:



4.4.48 Drop Time-Out

4.4.48.1 Description:

This feature is enabled in the Database Programming on a per station basis. When enabled, any outgoing CO line will be automatically timed and then dropped, after the system "Warning Tone Timed" is exceeded. This feature is normally used to control outgoing call traffic.

4.4.48.2 Related Feature:

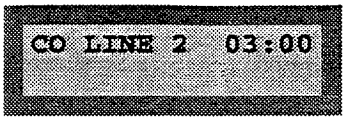
Warning Time
Warning Tone

4.4.48.3 Related Programming:

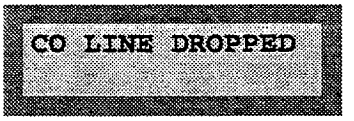
CALL HANDLING - WARNING TIME
STATION - DROP TIMEOUT
STATION - WARNING TONE

4.4.48.4 Operation:

If the Warning Time is set at 3 minutes and station x is set to Drop Timeout = "Y", the active CO line call will be as usual until 3 minutes of conversation has elapsed.



changes to:



then back to idle.

Notes:

a. The time limit of Drop Time-out is closely associated with Warning Tone Time programming. If the station's Warning Tone Time is set for 5 minutes and the Drop Time-out feature is enabled, after 5 minutes have expired, the outgoing CO line call in progress will be released automatically. A double beep is also heard.

b. If Drop Time-out is enabled, only outgoing CO line calls at that station are affected.

c. At default no Drop Time-out is enabled.

4.4.49 DTMF Receivers

4.4.49.1 Description

When the optional Option Module is installed the system provides two (2) DTMF receivers for decoding DTMF signals dialed by outside parties connected to incoming DISA lines. The receivers are also used for External Call Forward and CO Line-to CO Line Conference . During DISA line operation, receivers are released once the DISA ICM call is placed. During External Call Forward and CO Line-to-CO Line Conference, the DTMF receiver is retained on the line to respond to extended Talk Time Length (0 OPER *) (DISA only) or disconnect (0 OPER #) codes entered by the calling parties.

Note: the Option Module must be installed to provide the two available DTMF receivers.

4.4.50 Emergency Numbers (FEAT 1)

4.4.50.1 Description:

The Starplus DHS System Speed Dial feature provides use of emergency number calling at stations that may be otherwise restricted from dialing. All 80 System Speed Dial bins functionally override a station's COS. This capability allows easy adaptation in applications where restriction is required.

The System Speed Dial Emergency Number function is further partitioned by station COS. Station assigned COS 0-5 have access to all 80 System Speed Dial bins, Stations assigned COS 6 have access to System Speed Dial bin 20-39 only and COS 7 stations have no access to System Speed Dial.

In all cases, stations that have access to System Speed Dial can override restrictions that have been established for manually dialed calls for Emergency Numbers. Since the System Speed and Emergency Numbers are controlled by the system administrator, via Database Programming, certain stations may be allowed to use these pre-programmed numbers for business purposes only, while restricting other unauthorized or personal calls.

4.4.50.2 Related Feature:

System Speed Dial
Attendant Administration
Toll Restriction

4.4.50.3 Related Programming:

STATION - DAY/NITE COS
RESOURCE - ATTENDANT
RESTRICTION - CO LN CALL DISCR

4.4.50.4 Operation:

See System Speed Dial

Note: At default all stations have COS 0 and may access the Emergency System Speed Bins.

4.4.51 End-To-End Signaling

4.4.51.1 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 SLT Adapter/Expansion that are programmed as a "VM PORT".

4.4.51.2 Related Feature:

Voice Mail

4.4.51.3 Related Programming:

STATION - VM PORT
CALL HANDLING VM DIALING RATIO
SYS APPLICAT. - STA HUNT GROUP

4.4.52 ‡ External Call Forward (ECF)

4.4.52.1 Default Setting: Disabled

4.4.52.2 Related Feature:

System Speed Dial
Attendant Administration

4.4.52.3 Related Programming:

CALL HANDLING - EXTERNAL FORWARD

4.4.52.4 Description:

ECF allows you to forward calls after business hours. One line is designated for incoming call handling and another line is designated for forwarding the call. Calls are forwarded to the telephone number stored in System Speed Dial bin 99.

4.4.52.5 Operation:

Assuming that one line has been programmed as the ECF Incoming CO line and another line has been programmed as the ECF Outgoing CO line and System Speed Dial bin 99 contains a telephone number where calls will be forwarded:

When the ECF Incoming CO line is ringing:

1. The system answers the incoming call.
2. The system seizes the outgoing CO line.
3. The system dials the telephone number stored in System Speed bin 99.
4. The system will make a CO Line-to-CO Line Conference. A system DTMF receiver is connected to detect any service request from the external party.

Notes:

---

‡ External Call Forward requires the Option Module for operation.

a. The Option Module is required for ECF operation.

b. The activation time is programmable ("Never", "Day", "Night" or "Always").

c. The CO Line-to-CO Line Conference time is programmable(1, 2, 3, 5, 10, and 15 minutes).

d. The default conversation time is 1 minute.

e. The system maintains the forwarded connection until the "conversation time" expires or the forwarded party releases the connection by dialing 0 OPER #.

f. The System CO Line-to-CO Line Conference does not have to be enabled in the Database Programming.

g. ECF is greatly enhanced when Call Abandon is set to "yes" for CO lines that are to be used with ECF. With this setting enabled, the system will disconnect and terminate an ECF CO Line-to-CO Line Conference if either outside party goes on hook.

4.4.53 External Music Source

4.4.53.1 Description:

The system provides a dedicated phono jack type input to connect an external music source. This single source of music can be monitored at key telephone stations using the Background Music activation code. This source of music is also used for Music-On-Hold. Any CO line party placed on Hold will hear this music source. When the option card is equipped, the original external music source connector and interface board are removed and replaced by similar circuitry for two external music sources. When the option board is installed, the Background Music activation code can be used to listen to the Background Music channel only or the Background Music channel and the Music-On-Hold channel, depending on Database Programming.

The external music source volume can be attenuated at the KSU by use of an adjustable gain control screw. The external music source may be a radio tuner, tape deck, CD player or other source for the system Music-On-Hold and Background Music option.

4.4.54 External Paging FEAT 5 JKL 0 OPER 1

4.4.54.1 Default Setting: N/A

4.4.54.2 Description:

The system provides one-way, dedicated paging access to a paging amplifier. The External Paging Zone may be accessed individually or with all eight (8) Internal Paging Zones as an All Call Page.

Note: the External Page access code may be programmed on any feature button.

4.4.55 Feature Cancellation FEAT *

4.4.55.1 Default Setting: N/A

4.4.55.2 Description:

Features that you once enabled but now no longer require may be easily canceled using feature cancellation.

The features which can be canceled are:

FEAT * 9 WXY 1 — Call Back Delete

FEAT * 9 WXY 2 ABC — Set Alarm Clock Delete

FEAT * 9 WXY 3 DEF — Camp on Busy CO Line Delete

FEAT * 9 WXY 5 JKL — Auto Line Selection Delete

FEAT * 9 WXY 6 MNO Sn — Message Waiting Delete ("Sn" = station number where the message was left.)

FEAT * 9 WXY 0 OPER — Premises Message Delete

4.4.56 Flash FEAT 3 DEF

4.4.56.1 Default Setting: 700 ms

4.4.56.2 Related Feature:

Speed Dial (System and Station)
Last Number Redial
Programmable Feature Buttons

4.4.56.3 Related Programming:

CO LINE - CO LINE TYPE
CALL HANDLING - FLASH TIME
CALL HANDLING - PBX CODE

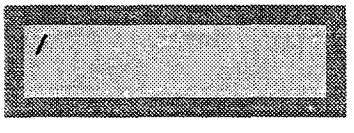
4.4.56.4 Description:

When Flash is accessed the system will generate a timed, open loop flash condition on any CO line. The 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.

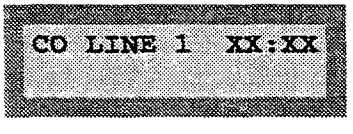
4.4.56.5 Operation:

While on a CO line call:

1. Press FEAT.
2. Dial 3 DEF. An Executive Telephone will display:



CO line loop is opened for the programmed Flash Time. At an Executive Telephone the display returns to the CO line connected display following the flash time-out or 10 seconds later.



Notes:

a. The Flash code may be stored in any speed dial bin.

b. The Flash code may be stored in the Last Number Redial buffer. When you activate redial, an Executive Telephone display will show a "/" to indicate the Flash code.

c. The Flash time is programmable from 100ms to 1500ms in increments of 100ms (1/10th of a second).

d. At an Executive Telephone. when the flash code is dialed a "\" will be displayed temporarily and then the display will return to the previous message unless other digits are dialed.

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

4.4.57 Flexible Button Inquiry

4.4.57.1 Default Setting: N/A

4.4.57.2 Related Feature:

Flexible Button Programming

4.4.57.3 Related Programming:

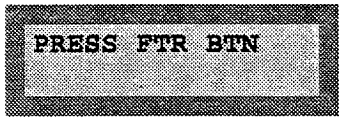
None

4.4.57.4 Description: [Executive Model only]

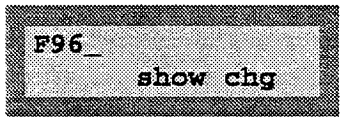
You may review the programming for flexible buttons at an idle Executive Telephone. In order to review the programming you must dial the Flexible Button Programming mode.

4.4.57.5 Operation:

1. Press FEAT.
2. Dial # 3 DEF. The display shows:



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



4. Press "**show**". The name of the feature is displayed.

The display then returns to the previous screen.

Notes:

a. Buttons without feature programming will display "UNASSIGNED BTN".
b. Refer to the key telephone button maps in the Configuration section for default button assignments.

4.4.58 Flexible Buttons Programming FEAT # 3 DEF

4.4.58.1 Default Setting: See key map at the beginning of this guide.

4.4.58.2 Related Feature:

Button Inquiry

4.4.58.3 Related Programming:

STATION - CO LINE ASSIGNM.
STATION - RECEIVE ASSIGNM.
RESOURCE - FEATURE BUTTON COPY

4.4.58.4 Description:

Depending upon the telephone model, eight (8) or twenty (20) programmable feature buttons are available. The Basic model has eight (8) dual-colored feature buttons for CO line, station; or feature access code assignments. The Enhanced and Executive models have twenty (20) dual-colored Programmable Feature Buttons.

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. Refer to Appendix A for a listing of feature codes.

4.4.58.5 Programming: Basic and Enhanced Telephones

1. Press FEAT.
2. Dial # 3 DEF.
3. Press a Programmable Feature Button.

To Program a System Feature:

4. Dial 2 ABC.
5. Press FEAT.
6. Dial the system feature code.
7. Press HOLD.

To Program a DSS/BLF Button:

4. Dial 1.
5. Dial the station number.
6. Press HOLD.

To Program a CO Line:

4. Dial 0 OPER.
5. Dial the CO line number or code for a CO line group. Refer to the table for CO Line Codes.
6. Press HOLD.

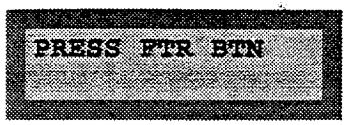
00 =Any Group	4 = CO Line 4
01 = CO Line Grp 1	5 = CO Line 5
02 = CO Line Grp 2	6 = CO Line 6
03 = CO Line Grp 3	7 = CO Line 7
04 = CO Line Grp 4	8 = CO Line 8
05 = ICM (Intercom)	9 = CO Line 9
1 = CO Line 1	10 = CO Line 10
2 = CO Line 2	11 = CO Line 11
3 = CO Line 3	12 = CO Line 12

To Erase the Contents of a Programmable Feature Button:

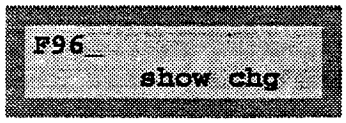
1. Press FEAT.
2. Dial # 3 DEF.
3. Press the Programmable Feature Button.
4. Dial 0 OPER.
5. Press HOLD.

4.4.58.6 Programming: Executive Key Telephone

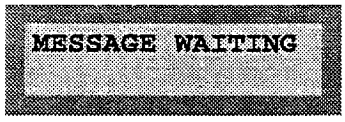
1. Press FEAT.
2. Dial # 3 DEF. The display shows:



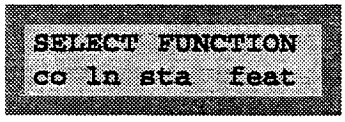
3. Press a Programmable Feature Button. The current contents of that button is displayed. For this example, let's use button 20.



4. Press "**show**". The name of the current feature stored is displayed.



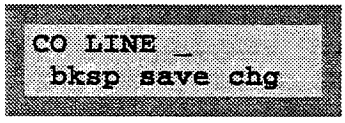
5. Press "**chg**". The display shows the following:



Three feature button categories are available for feature button programming; "**co ln**" (CO lines), "**sta**" (station) and "**feat**" (feature).

To Program a CO Line:

6. Press "**co ln**".



7. Dial the CO line number. Refer to the CO Line Code table above.

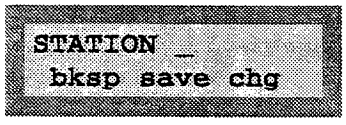
An intercom button may also be assigned in this sequence. The allowable range includes CO lines, CO line Groups and ICM button assignment.

8. Press "**save**".

Repeat Steps 3 through 8 to continue programming other feature buttons.

To Program a DSS/BLF Button:

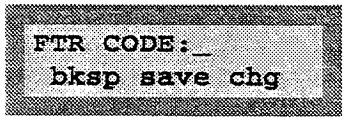
6. Press "**sta**". The display shows:



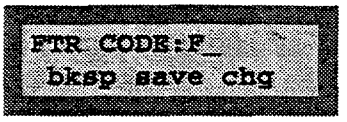
7. Dial the station number.
8. Press "**save**".

To Program a System Feature:

6. Press "**feat**". The display shows:



7. Press FEAT. An "**F**" will appear on the display:



8. Dial the feature code.
9. Press "**save**".

To Erase the Contents of a Programmable Feature Button:

- Press "**save**" instead of dialing a code

Notes:

a. If you dial an invalid code you will hear error tone and an Executive Key Telephone display will show "CODE UNAVAILABLE".
b. In some cases a user may program a feature button for a specific CO line although access is restricted to that line via database programming. In this situation, the telephone is still governed by database programming and would still be unable to access the CO line if restricted.
c. Valid feature codes must be in the form of either "Fn" or "Fnn" where "F" is the feature button and "n" is either a single-digit or two-digit code, including asterisk (*) and pound (#) dialed from the dial pad.
d. Any feature button programmed with a code previously assigned to a different feature button will cause the previously programmed feature button to become unassigned.
e. Programmable Feature Buttons cannot be programmed for CO Line Group operation when the system is configured for "KEY" system operation.

4.4.59 Flexible Line Assignment

4.4.59.1 Description:

In Station Database Programming, the station may be assigned outgoing access to any or all of the system CO lines. The user may program any CO line or Line Group to appear under any one of eight (8)/twenty (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. Refer to the Database Programming.

4.4.59.2 Related Feature:

CO line ringing

4.4.59.3 Related Programming:

STATION - RECEIVE ASSIGNMENT

Note: The number of dual-color LED buttons available depends on the key telephone model.

4.4.60 Flexible Receive Assignment

4.4.60.1 Description:

Stations may be allowed to answer or retrieve from hold, specific CO lines assigned in Database 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. Refer to the Database Programming.

4.4.60.2 Related Feature:

CO line ringing

4.4.60.3 Related Programming:

STATION - RECEIVE ASSIGNMENT

4.4.61 Flexible Ring Assignment

4.4.61.1 Description:

Any 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, with no method 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. Refer to Database Programming.

4.4.61.2 Related Feature:

CO line ringing
Flexible Receive Assignment

4.4.61.3 Related Programming:

STATION - RECEIVE ASSIGNMENT
STATION - CO LINE ASSIGNMENT

4.4.62 Forced Intercom Call Forward FEAT 4 GHI

4.4.62.1 Default Setting: N/A

4.4.62.2 Related Feature:

DND, Call Forward

4.4.62.3 Related Programming:

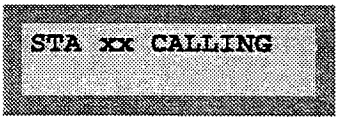
None

4.4.62.4 Description:

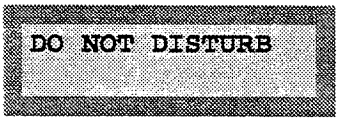
Tone ringing intercom calls can be immediately forwarded to the attendant by pressing the DND button.

4.4.62.5 Operation:

When your telephone is set to Tone Ring and another station is calling you: An Executive Telephone will display:



1. Press FEAT.
2. Dial 4 GHI. An Executive Telephone will display:



Notes:

a. 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.
b. If forced DND is activated, the operation is treated as if the calling party makes a new ICM call to the attendant.
c. You cannot activate Forced Intercom Call Forward if Call Forward is already enabled.

4.4.63 Forced Tone Ringing *

4.4.63.1 Default Setting: N/A

4.4.63.2 Related Feature:

Dial Intercom
Intercom Signal Mode Selection

4.4.63.3 Related Programming:

None

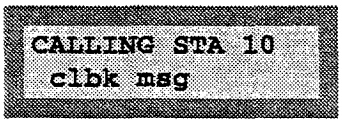
4.4.63.4 Description:

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.

4.4.63.5 Operation:

You have just placed an intercom call to a station in Voice Announce mode (Handsfree or Private) and cannot get a response. At an Executive Telephone the display shows:

- Dial * to change the alert signal at the called station from Voice Announce to Tone Ringing. At an Executive Telephone the display shows:



A Tone Ringing alert signal is sent and continues at the call station until answered.

If your call remains unanswered, you may dial * again to return to Voice Call Announce mode.

Notes:

a. It is not possible to force a station from Tone Ring mode to Voice Announce mode if that is the mode they have selected.
b. If you want to leave a Callback request at a called station that doesn't answer, the alert signal must be set for Tone Ringing.

4.4.64 Headset Mode FEAT 9 WXY

4.4.64.1 Default Setting: Disabled

4.4.64.2 Related Feature:

Speakerphone
Programmable Feature Button

4.4.64.3 Related Programming:

None

4.4.64.4 Description:

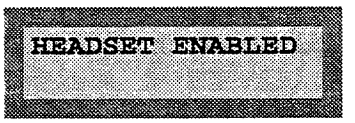
When the headset is installed the SPKR button is used to turn the headset on and off (switch between headset and speakerphone modes).

If the SPKR button is pressed while the telephone is idle, the headset is turned on. When the SPKR button is pressed again, the speakerphone mode is activated. At any time during any of these modes the handset may be lifted to disengage the headset or speakerphone mode.

4.4.64.5 Operation:

4.4.64.5.1 To Turn on the Headset:

1. Press FEAT.
2. Dial 9 WXY #. An Executive Telephone will display the following and you will hear confirmation tone.:



Once engaged, the headset is operated using the SPKR button.

4.4.64.5.2 To Answer an Incoming Call Using the Headset:

- Press SPKR. The SPKR lamp flashes to indicate that the headset is active.

4.4.64.5.3 To Switch From Headset to Speakerphone Mode:

- Press SPKR again. The SPKR lamp will light steady to indicate that you are now using the speakerphone.

4.4.64.5.4 To Return to Headset Mode:

- Press SPKR again.

4.4.64.5.5 To Switch From Headset/Speakerphone Mode to Handset Mode:

- Lift the handset.

4.4.64.5.6 To Switch From Handset Mode to Headset/Speakerphone Mode:

1. Press SPKR until the desired mode is active (you can determine which mode is active by observing the SPKR lamp).
2. Hang up the handset.

4.4.64.5.7 To Turn Off the Headset:

1. Press FEAT.
2. Dial 9 WXY #. An Executive Telephone will display the following and you will hear confirmation tone.

Notes:

a. You may assign a feature button with the Headset feature code and use the button to turn the headset on and off. When the headset is enabled that button will light.

b. While using the headset, you may pick up Intercom Voice calls by pressing SPKR.

c. Incoming CO line calls may be answered by pressing SPKR (for automatic priority ring selection) or by pressing the specific CO line button.

d. Other features like background music and muted ring continue to operate in the same manner while you are off-hook.
e. Non-amplified headsets may be powered directly from the key telephone. In most cases this interface permits the key telephone to control the Volume Up/Down and Mute features. Some headsets may require the use of the headset adapter keys to adjust the volume, mute and other headset functions.
f. Pressing CLEAR will disconnect calls when the Headset mode is active.

4.4.65 Hold Abandon

4.4.65.1 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.

Note: the CO line must have loop supervision interrupt signal from the local carrier upon disconnect by the outside party.

4.4.65.2 Related Feature:

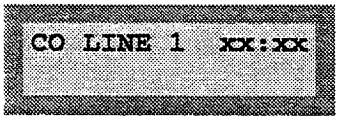
Hold (System)
Hold (Exclusive)

4.4.65.3 Related Programming:

CO LINE - CALL ABANDON
CALL HANDLING - CALL ABANDON TIM

4.4.65.4 Operation:

While connected to any CO line,



press HOLD, the CO line goes on hold.

Notes:

a. All types of Hold like System Hold, Exclusive Hold, and Conference Hold are related to the Hold Abandon feature.
b. Certain Central Offices do not provide loop supervision.
c. At default Call abandon is enabled for all CO lines.
d. If the outside, held party disconnects, the system will automatically release the held CO line.

4.4.66 Holding Call Answer/Select

4.4.66.1 Default Setting: N/A

4.4.66.2 Related Feature:

Hold (System)
Hold (Exclusive)

4.4.66.3 Related Programming:

CO LINE - CALL ABANDON
CALL HANDLING - CALL ABANDON TIM

4.4.66.4 Description:

Holding 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, Holding Call Answer will access the CO line that has been holding for the longest period of time while placing the current call on hold. Holding Call Answer works for all CO lines regardless of the station CO line button programming.

4.4.66.5 Operation:

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

Notes:

a. Holding Call Answer will also operate for intercom calls placed on hold.
b. If the person on Hold hangs up, the system will automatically release the held CO line.

4.4.67 Hold - Exclusive

4.4.67.1 Default Setting: 4 Minutes

4.4.67.2 Related Features:

Hold

4.4.67.3 Related Programming:

CALL HANDLING - EX_HOLD TIME

4.4.67.4 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.

4.4.67.5 Operation:

1. Press FEAT.
2. Press HOLD.

Notes:

a. 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.
b. 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.
c. Exclusive Hold is used only for CO line calls.
d. The Exclusive Hold duration is programmable from 1-8 minutes in the Database Programming.

4.4.68 Hold - System

4.4.68.1 Default Setting: N/A

4.4.68.2 Related Feature:

Call Transfer
Hold Abandon
Hold Reminder

4.4.68.3 Related Programming:

CALL HANDLING - REMIND TIME

4.4.68.4 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.

Notes:

a. If you have Auto Hold Allow enabled a line will be placed on system hold automatically whenever you switch from one CO line to another or when you press a DSS button.
b. Calls placed on Exclusive (private) Hold which have exceeded the Exclusive Hold programmed time, and calls recalling from a CO line transfer, will be placed on System Hold automatically.
c. There is a distinctive flash rate for a CO line that is on System Hold.

4.4.68.5 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.

Notes:

a. Pressing HOLD will place a conference on Exclusive Hold if you are the controlling party and you temporarily exit to add another party.
b. When an intercom call (conference) is placed on Hold, the steady lamp indication of the other station(s) will not change.
c. Any party who is placed on Hold will hear music only if available through the external music source connection.

4.4.69 Hold Reminder

4.4.69.1 Default Setting: 30 Seconds

4.4.69.2 Related Feature:

Hold (System/Exclusive)

4.4.69.3 Related Programming:

CALL HANDLING - REMIND TIME

4.4.69.4 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.

Notes:

a. The Hold Reminder time is system programmable and can be set for: 0 (disabled), 10/30/60/90 seconds.
b. Hold Reminder applies to both intercom and CO line calls.
c. Hold Reminder applies to CO line calls that are on System Hold, Exclusive Hold, or Screened Transfer Hold.

4.4.70 Hour Mode Selection

4.4.70.1 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 database programming along with the Hour Mode Selection, from any Executive Key Telephone station using the database programming password. The "AM" and "PM" indications are not displayed.

4.4.70.2 Related Features:

Attendant Administration
Station and System Alarm
Day/Night Service Mode

4.4.70.3 Related Programming:

RESOURCE - ATTENDANT
RESOURCE - NITE START
RESOURCE - NITE END
RESOURCE - SYSTEM ALARM
RESOURCE - SYSTEM TIME
RESOURCE - HOUR MODE

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

4.4.71 I-Hold Indication

4.4.71.1 Default Setting: N/A

4.4.71.2 Description:

I-Hold Indication allows you to easily 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.

4.4.72 I-Use Indication

4.4.72.1 Default Setting: N/A

4.4.72.2 Description:

When you are using an intercom or 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.

4.4.73 Intercom - Making An Intercom Call (non-blocking)

4.4.73.1 Default Setting: N/A

4.4.73.2 Description:

You can place an intercom (ICM) call by dialing the two-digit ICM number associated with the station you wish to call. If a Direct Station Selection/Busy Lamp Field (DSS/BLF) button is programmed, it can be used to place an ICM call. Intercom calls can be placed hands-free without lifting the handset.

You can determine how you receive intercom calls; either in Voice Announce Handsfree mode, Voice Announce Privacy mode, or Tone Ringing.

When you call a station which is in Voice Announce mode you can change the mode to Tone Ringing by dialing an asterisk  after the station number.

4.4.73.3 Operation:

Dial the desired station number (10-89).

Notes:

a. Intercom calls to telephones in Voice Announce - Hands-free or Voice Announce - Private (via code ) are "logically" answered by the system at the called station.

b. Intercom dial tone may be heard automatically upon lifting the handset or after pressing the  button, if enabled under the Auto Line Selection station feature.

4.4.74 Last Number Redial FEAT 8 TUV

4.4.74.1 Default Setting: Empty

4.4.74.2 Related Features:

Automatic Busy Redial

4.4.74.3 Related Programming:

RESOURCE - DIAL TONE DET.
RESOURCE - DIAL WAIT TIME

4.4.74.4 Description:

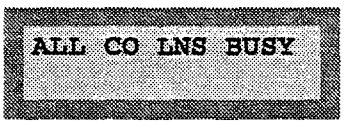
The Last Number Redial (LNR) feature automatically dials the last number dialed from your telephone. LNR will repeat a hook-flash in the same sequence as it was first dialed. If a speed dial number was first dialed, LNR will dial the speed dial number and any subsequent manually dialed digits. A maximum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

4.4.74.5 Operation:

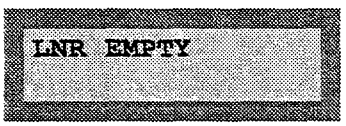
You may either choose a specific CO line for use with LNR by first pressing that CO line button or you may allow the line to be selected automatically by the LNR feature.

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

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



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



Notes:

a. Last Number Redial cannot be applied to intercom calls.
b. 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".
c. The database 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 preprogrammed period of time before digits are dialed from the LNR memory on the CO line.
d. 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.
e. The LNR feature code may be programmed on a programmable feature button.

4.4.75 Letter Scheme

4.4.75.1 Description:

Station User Names (programmed into the customer database) may be enhanced for special requirements using the choices available in the Letter Schemes. The end user may select from six different lettering schemes that can be programmed for use at any one installation. While User Names are being entered (in database programming) and while the user is editing an Outgoing Message, the chosen Letter Scheme characters will be accessible with successive depressions of the "1" dial pad key. Use the table at right to determine what letter scheme best suits this installation.

	Character for nth depressions of dial key "1".					
	1st	2nd	3rd	4th	5th	6th
Scheme 0						
Scheme 1						
Scheme 2						
Scheme 3						
Scheme 4						
Scheme 5						

4.4.75.2 Related Features:

User Names
Message - Outgoing

4.4.75.3 Related Programming:

RESOURCE - LETTER TYPE
RESOURCE - USER NAMES

4.4.76 Loud Bell Control (Optional)

4.4.76.1 Description:

When equipped with the optional Option Module, the system provides one 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 database programming (data field Ring Scheme). The external loud bell ringing device is customer provided. It is recommended that a 24 vdc device be used. An external power source is required.

4.4.76.2 Related Features:

None

4.4.76.3 Related Programming:

CO LINE - LOUD BELL
RESOURCE - RING SCHEME

4.4.77 Meet Me Page FEAT 5 JKL 9 WXY

4.4.77.1 Default Setting: N/A

4.4.77.2 Related Features:

Group Paging
All Paging
External Paging
Page Allow/Deny

4.4.77.3 Related Programming:

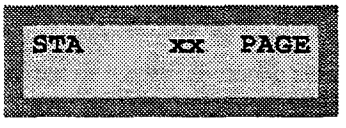
None

4.4.77.4 Description:

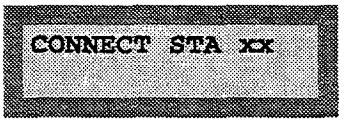
Anyone paging internally or externally may be answered for a private "Meet Me" connection. After hearing the page, you can dial the Meet Me Page code from any telephone and be connected to the person paging. During a Meet Me Page the internal and external paging zones are released and new pages may be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

4.4.77.5 Operation:

While a page is currently in progress, an Executive Telephone displays:.



1. Press FEAT.
2. Dial 5 JKL 9 WXY. The display shows:



Notes:

a. A page may be answered at any telephone using the Meet Me Page code, even if the page announcement is not heard over the telephone speaker.
b. The page may be any zone page or all page.
c. The Meet Me Page code may be programmed on any available flexible button.

4.4.78 Message - Outgoing

4.4.78.1 Default Setting: Not set

4.4.78.2 Related Features:

Message Waiting

4.4.78.3 Related Programming:

RESOURCE - PREPROG MESSAGE - OUTGOING MESSAGE

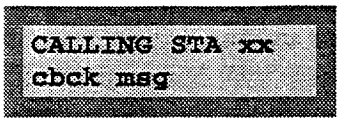
4.4.78.4 Description: [Executive Model only]

You may send a message waiting, a customized message, or one of six (6) preprogrammed messages to other Executive Key Telephone users on the system.

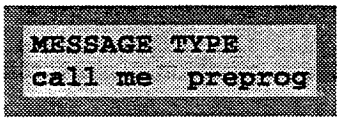
A basic message waiting is sent by pressing the soft "call me" button. You may customize the first message by using the dial pad and selecting letters (16 characters maximum) to spell your message. You can send one (1) of the remaining six (6) messages by simply pressing the send button (soft button) when the desired message is displayed.

4.4.78.5 Operation:

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



1. Press "**msg**" and the display changes to:

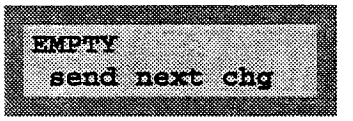


To Send a Message Waiting:

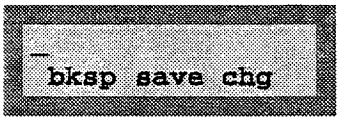
2. Press "**call me**".

To Send a Customized Message:

2. Press "**preprog**".



3. Press "**chg**".



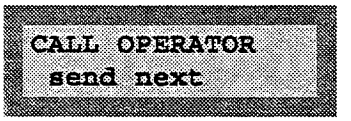
4. Spell the message (16 letters/symbols maximum) using the dial pad keys.

Use the dial pad keys as illustrated in the table below to select letters. For instance, to select the letter "H" press dial pad key "4" twice.

Dial Pad Key Alphanumeric Value for Name Programming												
Depressions:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*****	**0**	**#**
1st	note a	A	D	G	J	M	P	T	W	note b & c	Q	note d
2nd		B	E	H	K	N	R	U	X		Z	
3rd		C	F	I	L	O	S	V	Y			

To Send a Preprogrammed Message:

3. Press "**next**". The display shows:



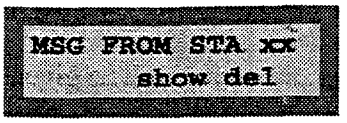
4. Continue pressing "**next**" until the desired message is displayed. The preprogrammed messages are as follows:

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

5. Press "**send**".

Receiving a Message:

The Message Wait button will flash and the display shows:



- Press "**show**" to display the message sent to you.

Notes:

a. Dial Key 1 is used to select special characters. Refer to the Letter Scheme feature. Depending on the Letter Scheme selected (programmed) the dial key "1" may be used to insert various special characters.
b. Dial "*" before a dial key to insert the number on the dial pad key instead of a letter in this character position.
c. When "*" is pressed after a letter has been selected for this character position, the selected letter is forced to lower case.
d. 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 "8666#6".
e. Dial "#" to insert a space.

4.4.79 Message - Executive Notify FEAT 9 WXY 0 OPER

4.4.79.1 Default Setting: None set

4.4.79.2 Related Feature:

ICM Calling

4.4.79.3 Related Programming:

RESOURCE - PREPROG MESSAGE - EXECUTIVE NOTIFY

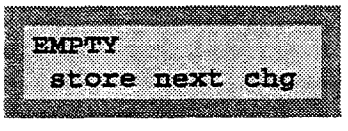
4.4.79.4 Description: [Executive Model only]

Executive Notify provides you with a method to inform callers of the reason you are away from your telephone. An Executive Notify message can be preprogrammed in the system database and may contain up to 16 characters or digits. There are six (6) preprogrammed messages and one (1) 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.

4.4.79.5 Programming:

1. Press FEAT.
2. Dial 9 WXY 0 OPER. The display will show:

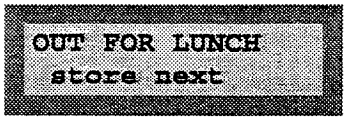


To Customize Your Message:

3. Press "**chg**".
4. Use the dial pad keys to spell your personalized message. Refer to the table provided in the Message - Outgoing section to determine how to select desired letters.

To Select a Preprogrammed Message:

3. Press "**next**".



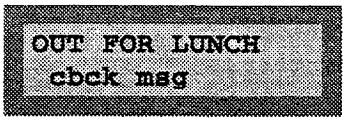
4. Continue pressing "**next**" until the desired message is displayed. The preprogrammed messages are as follows:

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

5. Press "**store**".

4.4.79.6 Operation:

Let's use "OUT FOR LUNCH" as an example. When another Executive Key Telephone user calls you the message "OUT FOR LUNCH" will be displayed on the caller's telephone display:



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

Note: the Executive Notify feature code may be programmed on a programmable feature button.

4.4.80 Message Waiting FEAT 9 WXY 6 MNO

4.4.80.1 Default Setting: Programmable Feature Button 20 is message waiting.

4.4.80.2 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 preprogrammed message.

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

4.4.80.3 Operation: Basic and Enhanced Telephones

Sending a Message Waiting:

1. Press FEAT.
2. Dial 9 WXY 6 MNO.
3. Dial the station number where the message is to be left.

Answering a Message Waiting:

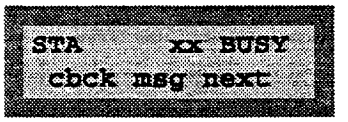
1. Press FEAT.
2. Dial 9 WXY 6 MNO or press a flashing MESSAGE WAIT button (if a flexible button has been programmed for Message Wait).

4.4.80.4 Operation: Executive Telephone

Sending a Message Waiting:

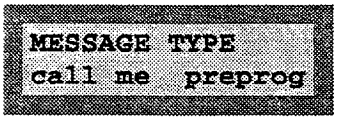
Upon calling Station xx and receiving no answer or busy:

or

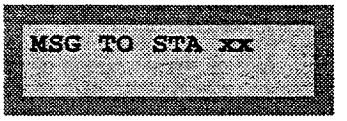


Note: "**cbck**" won't be displayed unless called station is in tone mode.

1. Press "**msg**".

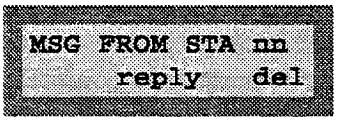


2. Press "**call me**". You will hear confirmation tone.



Answering a Single Message Waiting:

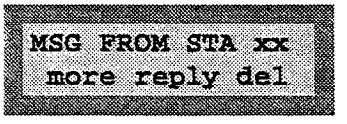
Your telephone display shows the following and the Message Waiting lamp (if a button is programmed) will flash:



- Press "**reply**" to answer the message or "**del**" to delete the message without replying.

Answering Multiple Message Waitings:

Your telephone display shows the following:



- Press "**more**" to review the other messages.

Canceling a Message Waiting Left at Another Station:

1. Press FEAT.
2. Dial * 9 WXY 6 MNO.
3. Dial the station number where the message was left.

Notes:

a. The system will allow a total of forty-eight (48) message waitings in the system at any one time.
b. At Executive Key telephones, the message waiting indication will not be removed until "**reply**" or "**delete**" is pressed.
c. Each station can leave only one message waiting at any one station. (i.e. Station A cannot leave two message waitings at Station B).
d. Each station may receive more than one message waiting from various stations.
e. A flexible button must be assigned on the Basic and Enhanced models in order to receive visual Message Waiting indication.
f. Multiple messages are retrieved in the order that they were left.

4.4.81 Music On-Hold

4.4.81.1 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. There is one music source interface connector in the standard configuration. When equipped, the optional Option Module provides interface for two music sources. One source may be used exclusively for BGM, and the other for BGM and Music-On-Hold.

4.4.82 Mute

4.4.82.1 Default Setting: N/A

4.4.82.2 Description:

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

4.4.82.3 Operation:

- Press MUTE to enable or disable.

Note: the MUTE button may also be used for Push-to-Talk operation during a Voice Over Busy call connection.

4.4.83 Muted Ringing

4.4.83.1 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 VOL ▲ / VOL ▼ buttons.

4.4.84 Name In Display

4.4.84.1 Description:

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.

4.4.84.2 Related Feature:

None

4.4.84.3 Related Programming:

RESOURCE - USER NAME

Notes:

a. When a User Name is programmed for stations the "STA" normally displayed at that idle station will be replaced with the programmed name.
b. Names may be seven (7) or fewer characters in length.

4.4.85 Night Service FEAT # 2 ABC

4.4.85.1 Default Setting: DAY Mode

4.4.85.2 Related Feature:

Attendant Administration

4.4.85.3 Related Programming:

none

4.4.85.4 Description:

The system can be programmed for Night Service operation which affects incoming CO line ringing and receive assignments. Any station 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.

4.4.85.5 Operation:

At any telephone, while in the idle state;

1. Press FEAT
2. Dial * 2 ABC.

Notes:

a. Each time the Night Service code is entered the system mode of operation changes to the opposite mode.
b. When the system is in the Night Service mode, all Executive Key Telephones will display "night".

4.4.86 On Hook Dialing

4.4.86.1 Default Setting: N/A

4.4.86.2 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 Basic key telephone can monitor outside calls and receive one-way paging announcements, but cannot reply unless the handset is lifted. The Enhanced and Executive models provide full hands-free speakerphone operation in addition to On-Hook Dialing.

4.4.86.3 Operation:

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

Note: 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). Refer to Automatic Line Selection.

4.4.87 Page Allow/Deny FEAT * 9 WXY 9 WXY / FEAT 9 WXY 9 WXY

4.4.87.1 Default Setting: Page Allow

4.4.87.2 Related Feature:

Page Announcements

4.4.87.3 Related Programming:

None

4.4.87.4 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.

4.4.87.5 Operation:

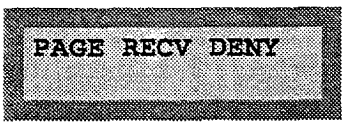
To Allow Page Announcements:

1. Press FEAT.

2. Dial * 9 WXY 9 WXY. The display will show:

To Deny Page Announcements:

1. Press FEAT.
2. Dial 9 WXY 9 WXY. The display will show:



Note:

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

4.4.88 Paging FEAT 5 JKL 0 OPER

4.4.88.1 Default Setting: All stations are in zone 1.

4.4.88.2 Related Feature:

DND

Meet Me Page

4.4.88.3 Related Programming:

STATION - STA GROUP

4.4.88.4 Description:

You can perform several types of pages:

Internal Paging - you can page a group or place a system-wide internal page.

External Paging - you can access external/ancillary paging equipment.

All Call Paging - you can 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.

4.4.88.5 Operation: Basic and Enhanced Telephones

Internal Paging:

1. Press FEAT.
2. Dial 5 JKL 0 OPER 0 OPER.

External Paging:

1. Press FEAT.
2. Dial 5 JKL 0 OPER 1.

All Call Paging (Internal and External):

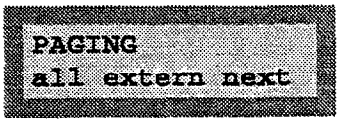
1. Press FEAT.
2. Dial 5 JKL 0 OPER 2 ABC.

Group Paging:

1. Press FEAT.
2. Dial 5 JKL 0 OPER 3 DEF.
3. Dial Group Number. (1-8)

4.4.88.6 Operation: Executive Key Telephone:

1. Press FEAT.
2. Dial 5 JKL 0 OPER. This display will show:



Internal Paging:

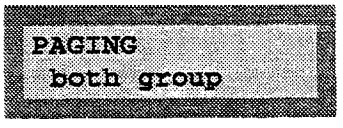
3. Press "**all**".

External Paging:

3. Press "**extern**".

All Call Paging (Internal and External)

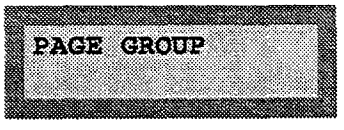
3. Press "**next**" The display shows:



4. Press "**both**".

Group Paging:

3. Press "**group**". The display shows:



4. Dial the group number.

Notes:

a. The display will show "PAGE FAILURE" if a page fails due to no available idle station or a busy external amplifier.
b. Various types of paging may be answered from any idle station. (Refer to Meet Me Page.)
c. Page Groups coincide with Station Groups. There are eight (8) possible Station Groups.
d. Any of the paging codes may be stored on a programmable feature button.

4.4.89 Pause FEAT 7 PRS 0 OPER

4.4.89.1 Default Setting: N/A

4.4.89.2 Related Features:

Last Number Redial
Speed Dial (System & Station)
Automatic Busy Redial
Pulse-to-Tone Switch-over

4.4.89.3 Related Programming:

CALL HANDLING - PAUSE TIME

4.4.89.4 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.

4.4.89.5 Operation:

During dialing on any CO line or when programming a Speed Dial bin:

1. Press FEAT.
2. Dial 7 PRS 0 OPER.

Note: pause may be stored on a programmable feature button.

4.4.89.6 Operation:

During dialing on any CO line or when programming a Speed Dial number, a pause can be inserted by entering code FEAT 7 PRS 0 OPER.

4.4.90 PBX Compatibility

4.4.90.1 Description:

Any CO line in the system may be programmed as a PBX type facility. Station users may use that PBX facility via a CO line button. To make a PBX call, that CO line button is accessed and the PBX station number is dialed. To use the PBX facility to make an outgoing call, the PBX Trunk code must be dialed to receive outside Central Office dial tone. This code may be programmed into the system as a PBX Trunk access code. Once programmed, the system will identify these codes when dialed and adjust feature operation accordingly.

4.4.90.2 Related Feature:

Last Number Redial
Automatic Busy Redial

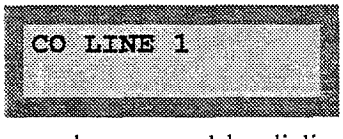
4.4.90.3 Related Programming:

CO LINE - CO LINE TYPE
RESOURCE - PBX CODE
RESOURCE - PBX AUTO PAUSE

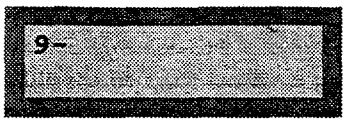
4.4.90.4 Operation:

CO Line x is connected to a PBX for PBX feature access. The PBX uses the code "9" to access a PBX trunk for out call dialing. (The code "9" has been programmed into the Starplus DHS as the PBX CODE for trunk access.)

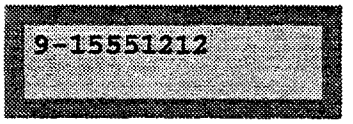
When CO line x is accessed.



PBX dial tone is heard. Any PBX feature may be accessed by dialing the PBX feature code. If the digit "9" is dialed, the Starplus is aware that this call is being placed on a PBX trunk (outgoing call).



A hyphen ("-") is inserted automatically after the dialed digit "9" for better display clarity. Subsequent digits dialed are displayed after the hyphen.



Notes:

a. When the PBX CODE is programmed, the Starplus DHS will apply station toll restriction when the code is dialed.
b. LNR and ABR will recognize the code and automatically insert a pause following the code when used.
c. The PBX access code may be one or two digits.
d. After the entering PBX access code, the system will automatically stop dialing for a specified time (1 - 9 seconds programmable) and then continue the dialing process.
e. At default no CO line is type PBX.
f. At default the PBX access code is 9.
g. At default the PBX Auto Pause Insertion time is 1 second.

4.4.91 Phone Lock/Unlock FEAT 9 WXY 7 PRS

4.4.91.1 Default Setting: Unlocked

4.4.91.2 Description:

You may use this feature to prevent unauthorized outside calling from your telephone. The feature code is also used to program your private four-digit password number.

4.4.91.3 Programming: Basic and Enhanced Telephones

To Lock the Telephone:

1. Press FEAT.
2. Dial 9 WXY 7 PRS.
3. Dial your password.
4. Dial *.

To Unlock the Telephone:

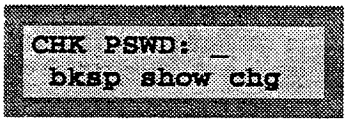
1. Press FEAT.
2. Dial 9 WXY 7 PRS.
3. Dial your password.
4. Dial *.

To Change Your Password:

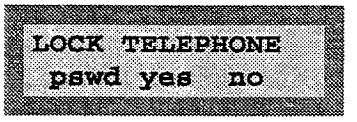
1. Press FEAT.
2. Dial 9 WXY 7 PRS.
3. Dial your current password.
4. Dial the new password.

4.4.91.4 Programming: Executive Telephone

1. Press FEAT.
2. Dial 9 WXY 7 PRS. The display shows:

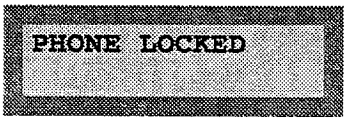


3. Dial your password (at default it is "0000".)
4. Press "**show**". The display shows:



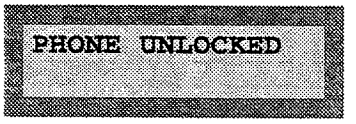
To Lock the Telephone:

5. Press "**yes**". The display shows:



To Unlock the Telephone:

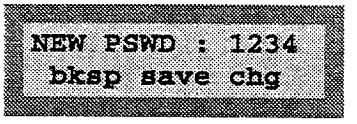
5. Press "**no**". The display shows:



To Change Your Password:

5. Press "**pswd**". The display shows:

6. Dial your new password (up to four digits). The display shows:



7. Press "**save**".

Notes:

a. When your telephone is locked you can only make intercom calls. You may still answer calls and held lines while your telephone is locked.
b. If you accidentally forget your password it may be retrieved through the system database administration password.
c. The Attendant designated station's Private Password is used to enter Attendant Administration.
d. If you try to make a CO line call from a locked telephone you will hear error tone and the display will show "PHONE LOCKED".
e. The Phone Lock feature code may be programmed on a programmable feature button.

4.4.92 Privacy

4.4.92.1 Default Setting: All intercom and CO lines are private

4.4.92.2 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 your Class of Service allows If the Privacy Release and Voice Over Busy features are available to you, as determined by your programmed Class of Service, you may use those features to override the Privacy feature.

4.4.93 Privacy Release

4.4.93.1 Default Setting: Disabled

4.4.93.2 Related Feature:

Privacy

4.4.93.3 Related Programming:

STATION - DAY/NITE COS
CALL HANDLING - PRIVACY RLS
CALL HANDLING - PRIV RLS TONE

4.4.93.4 Description:

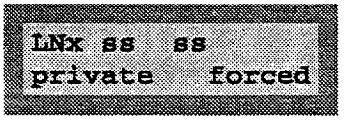
Privacy release may be enabled on a system-wide basis to allow multiple users to join a conversation on busy CO lines. When Privacy Release is enabled through programming you may press a busy CO line button at an idle telephone to join that conversation.

Your programmed Class of Service (COS) determines whether you have access to Privacy Release. If your COS is equal to or greater than that of the station engaged in the conversation on the CO line you will be allowed to join the conversation.

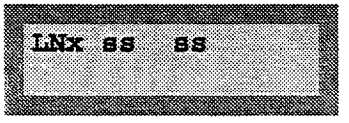
4.4.93.5 Operation:

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

- Press that CO line button. A conference is established and the user that originated the call is the conference controller. The controller's display reads:



Refer to Conference for details of options from the controller's telephone. Your telephone display shows:



("ss" in each display indicates the station numbers that are joined in the call.)

Notes:

a. If there are already four parties joined together further attempts by other stations to join the CO line conversation will receive busy indication.
b. A telephone must have a CO line button appearance of the busy CO line to join.

4.4.94 Private Line

4.4.94.1 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. The Private Line is used exclusively by the station that is assigned the Private To station in Database Programming.

4.4.94.2 Related Feature:

None

4.4.94.3 Related Programming:

CO LINE - PRIVATE TO

Notes:

a. 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 assignments for that station.
b. Other stations programmed to receive ringing are allowed to answer the private line when it is ringing.

4.4.95 Pulse to Tone Switch-Over *

4.4.95.1 Default Setting: N/A

4.4.95.2 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.

4.4.95.3 Operation:

As you dial on a dial pulse CO line;

- Dial *. All subsequent digits will be sent as DTMF digits.

Notes:

a. The dialing conversion can only be from pulse mode to tone (DTMF) mode, not from DTMF back to pulse mode.
b. The Pulse-to-Tone Switch-over code can be programmed in any speed dial bin.

4.4.96 Recall - Transfer Recall

4.4.96.1 Default Setting: 30 seconds

4.4.96.2 Related Feature:

CO Line Call Transfer

4.4.96.3 Related Programming:

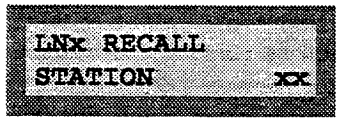
CALL HANDLING - RECALL TIME

4.4.96.4 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 transfer Ring-back tone. During recall, the CO line returns to System Hold allowing any station with normal CO line receive privileges to retrieve the recalling line.

4.4.96.5 Operation:

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



Note:

Recalls are not directed to the programmed Alternate Attendant station.

4.4.97 Reminder Tones

4.4.97.1 Default Setting: N/A

4.4.97.2 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.

4.4.98 Ringing Line Priority

4.4.98.1 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:

Intercom Call Back
Camped CO Line
Recalled CO Line call
Transferring CO Line call
Incoming CO Line call
Incoming ICM call

4.4.98.2 Operation:

When your station is ringing, lift the handset or press the SPKR button to pick up the incoming call.

4.4.99 Save/Redial Saved Number FEAT 5 JKL 1

4.4.99.1 Default Setting: Empty

4.4.99.2 Related Feature:

None

4.4.99.3 Related Programming:

RESOURCE - DIAL TONE DET.
RESOURCE - DIAL WAIT TIME

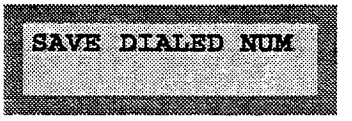
4.4.99.4 Description:

Redial Save Number 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 RSN code, regardless of what feature operations or numbers have been dialed at your telephone since you stored the number.

4.4.99.5 Programming:

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

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



4.4.99.6 Operation:

1. Press FEAT.
2. Dial 5 JKL 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.

Notes:

a. The SDN is a maximum of sixteen (16) digits.
b. If the SDN buffer is empty the display will show "NO SAVED NUMBER".
c. If all CO lines are busy the display will show" ALL CO LINES BSY".
d. The Save Dialed Number feature code may be stored on any feature button for one-button storing or dialing operation.

4.4.100 Single Line Telephone (2-Port SLT Adapter)

4.4.100.1 Description:

A 2-Port SLT Adapter is provided for connection of standard, two-wire, analog telephone equipment to the digital network of the DHS. Common uses of the 2-Port SLT Adapter are voice mail, facsimile machines, modems, and single line analog telephones.

The 2-Port SLT Adapter is a self-contained, system-powered apparatus that creates two (2) separate analog station ports from one system 2B+D digital key telephone port. The housing accommodates the electrical components of the 2-Port SLT Adapter and the 2-Port SLT Expansion. The 2-Port SLT Expansion PCB is exactly the same PCB and function as the 2-Port SLT Adapter PCB function. (One 2-Port SLT Expansion may be added to the 2-Port SLT Adapter housing.)

The 2-Port SLT Adapter and 2-Port SLT Expansion each provide two 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 (25) 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 (SLTs) are not traffic sensitive and do not require special traffic balancing. For more information on the analog adapters, refer to Configuration - Specifications and Installation sections.

4.4.100.2 Related Feature:

Voice Mail

4.4.100.3 Related Programming:

STATION - STA POSITION
CALL HANDLING - SLT_HOOKFLASH

Notes:

a. Any single line (2500 type) telephone equipment can be connected to the system using the 2-Port SLT Adapter and 2-Port SLT Expansion.
b. Directory Numbers (System Numbering Plan) 58-81 are assigned to B2 channels for SLT use at default.
c. Directory Numbers can be changed in Customer Database Programming.

4.4.101 ‡SMDR (Station Message Detail Recording)

4.4.101.1 Description:

This feature allows the system administration to track all incoming and outgoing CO line traffic, chronologically by station number. SMDR is output from the "SMDR" RS232 serial port located on the optional Option Module. 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 database 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 the chart below for data examples.

```
0        1         2         3         4         5         6         7
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789
STA  TRK  DGT_DIALED          RING  DATE  TIME     DURATION   ACCOUNT BR CMT
XX   XX   XXXX...XXXX         MM:SS XX/XX HH:MM:SS HH:MM:SS   XXXXXXXX   XXXX
11   01                       00:00 01/02 11:15:55 00:00:47           $  LNH
```

4.4.101.2 Data Field Description:

MM = minute
HH = hour
SS = second
STA = Station number/Incoming DISA CO line number/Incoming ECF CO line number
TRK = CO line number, 2 digits with prefix 0
DGT_DIALED = Telephone number (outgoing call only, maximum 16 digits, left aligned)
RING = CO Line incoming ringing duration before answer (Incoming call only)
DATE = Day/Month (DD/MM)
TIME = Start time of call conversation
DURATION = Conversation time
ACCOUNT = Account code entered for billing purposes (maximum 8 digits, left aligned)
BR = Battery reversal detected
CMT = Comment

- LNH = CO line call held by another station, later answered and released by the output station number
- LNC = CO line call is invited into conference, but is released by the output station number
- DISA = CO line call is established through DISA feature
- ECF = CO line call is established through ECF feature

A carriage return (CR) is generated after each record output.

The following are sample records.

---

‡ SMDR requires the Option Module for operation.

```
10   03   1234567890123456          01/02 11:10:36 00:02:54  12345678 $  LNC
14   01   5551212                   01/02 11:09:43 00:03:51           $
10   01                        00:32 01/02 11:15:03 00:00:52           $
11   01                        00:00 01/02 11:15:55 00:00:47           $  LNH
11   01   4436000                   01/02 01:53:18 00:00:33           $
21   02   602-443-6000         00:03 01/02 02:53:12 00:00:39           $
21   02   VODAVI COMMUNIC      00:03 01/02 02:53:12 00:00:39           $
```

Unanswered Caller ID SMDR Output Sample Record(Feature Package 2)

```
STA  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  XXXXXXXX
NA   02   PHONE INCORPORATED 00:53 01/01 01:53:12 00:00:00  XXXXXXXX
```

4.4.101.3 Related Feature:

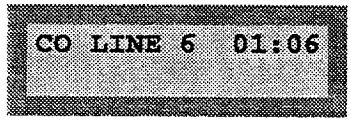
Account Codes Unverified/Forced Verified

4.4.101.4 Related Programming:

RESOURCE-SMDRX_RATE

4.4.101.5 Operation:

Station 10 dials 555-1212 from CO Line 6 and talks 66 seconds:



Press the CLEAR button or go on hook and disconnect the CO line call. A call record is generated. The following call record will be printed out if the connected printer is ready.

```
10   06   5551212                   01/02 11:09:43 00:01:06           $
```

Notes:

a. 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.
b. Data format is no parity, eight (8) data bits, one (1) stop bit. Baud rate is adjustable.
c. At default the SMDR RS232C serial port is set at 9600 BPS.
d. CO line calls must exceed 10 seconds for an SMDR record to be generated.
e. In the last two lines of the SMDR record sample (extension "21" used), caller identification SMDR records are illustrated.

4.4.102 Speed Dialing FEAT 1

4.4.102.1 Default Setting: All bins are empty.

4.4.102.2 Related Feature:

External Call Forward
Attendant Administration

4.4.102.3 Related Programming:

RESOURCE - DIAL TONE DET.
RESOURCE - DIAL WAIT TIME

4.4.102.4 Description:

Speed Dialing allows you to store frequently dialed numbers. These numbers are easily 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 twenty (20) personal (station) speed numbers in memory (bins 00-19). There are also eighty (80) Speed Dial bins allocated for system-wide use (bins 20-99). System Speed Dial is programmed via Attendant Administration or via customer database programming.

4.4.102.5 Programming: Basic and Enhanced Telephones

To Store a Telephone Number in a Personal Speed Dial Bin:

1. Press FEAT.
2. Dial #1.
3. Dial the bin number (00-19) inwhich to store the telephone number.
4. Dial the telephone number.
5. Press HOLD. You will hear confirmation tone.

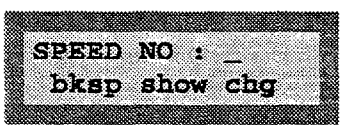
To Erase the Contents of a Speed Dial Bin:

1. Press FEAT.
2. Dial #1.
3. Dial the bin number (00-19) to erase.
4. Press HOLD. You will hear confirmation tone.

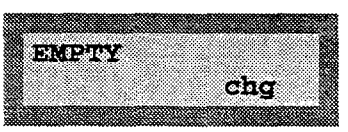
4.4.102.6 Programming: Executive Key Telephone

To Store a Telephone Number in a Personal Speed Dial Bin:

1. Press FEAT.
2. Dial #1. The display shows:



3. Dial the bin number (00-19) 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:

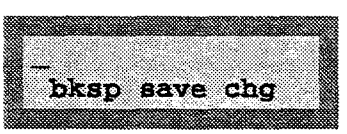


To Accept the Current Contents:

5. Press HOLD to return to the bin entry screen or CLEAR to exit without and changes.

To Change the Contents of the Bin:

5. Press "**chg**". The display shows:



6. Dial the telephone number to be stored (up to 16 digits).
7. Press "**save**".

To Continue Storing Telephone Numbers in Additional Bins:

8. Repeat Steps 3 through 7.

To Erase the Contents of a Speed Dial Bin:

- Press "**save**" instead of dialing a number in Step 6 above.

To Exit Speed Dial Programming:

- Press CLEAR.

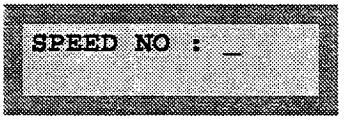
Special Programming Note:	Speed dial bins may be chained together. Enter FEAT 1 + BIN # as part of the number in any speed bin to dial that bin contents after the contents of the current bin.

4.4.102.7 Operation:

To Dial a Number Stored in Speed Dial:

Note: You may choose to first press an idle CO line or you may let the system automatically select the line.

1. Press FEAT.
2. Dial 1. At an Executive Key Telephone the display shows the following:



3. Dial the desired bin number (00-99).

Notes:

a. Only an Executive Key Telephone can program System Speed Dial bins using Attendant Administration.
b. System Speed Bin 99 is used for External Call Forward, when equipped.
c. Speed bins may be chained. Pauses and Flashes may be stored in Speed Dial. Chaining, Pauses and Flashes each occupy one character position.
d. If you access an empty bin the display will show "SPEEDNO IS EMPTY".

4.4.103 Station Feature Status Check FEAT # 8 TUV

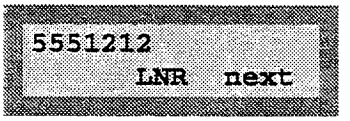
4.4.103.1 Default Setting: None

4.4.103.2 Description: [Executive Model only]

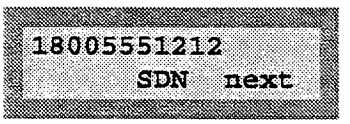
The Executive Key Telephone user can quickly determine the status of all user-controlled features. This feature is useful for the technician as well as the user since some feature conditions may not be evident if they are not programmed on an available programmable feature button. The current status can be observed using the soft interactive buttons.

4.4.103.3 Operation:

1. Press FEAT.
2. Dial # 8 TUV. 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
Day COS
Night COS
Auto Hold mode setting
Phone Lock status
Voice Announce mode setting
Call Wait setting
Page Receive setting
Night Station status

4.4.104 Station Groups

4.4.104.1 Description:

The system provides eight (8) Station 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, via the Group Call Pickup code (FEAT 5 JKL 4 GHI). Unlike Directed Call Pickup, you do not have to know or remember the ringing station's intercom number.

As a Station Group member, you also receive Internal Zone Pages directed to your Station Group. Station Groups are assigned in the Database Programming.

Note: at default all stations are in Station Group 1.

4.4.105 Station Numbering Plan

4.4.105.1 Description:

All stations receive a two-digit ICM number for inside calling. The two-digit directory ranges from 10-81. Before a station can be assigned a directory number already in use, the other station must be re-assigned to a new vacant number. Refer to Database Programming.

4.4.106 System Time

4.4.106.1 Description:

The system provides a built-in timer to track System Time for reference in certain features such as System Night Service Mode Change, SMDR Call Message Recording, Alarm Clock Check, etc. Refer to Database Programming.

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.

4.4.107 Toll Restriction

4.4.107.1 Description:

The Digital Hybrid System provides sophisticated monitoring of digits dialed on CO lines. If a digit or range of digits dialed on a CO line doesn't 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 Classes of Service (COS). Stations may be assigned a separate COS for Day System Mode operation and Night System Mode operation.

4.4.107.2 Related Feature:

COS Assignment
Digit Interval Table Programming
System Speed Dialing
Night Service

4.4.107.3 Related Programming:

RESTRICTION - CO LN CALL DISCR
STATION - DAY/NITE COS
CALL HANDLING - DISA - DAY/NITE COS

4.4.107.4 Operation:

CO line calls placed must appear in the Digit Interval Allow Table and marked for association with the COS assigned the station attempting the call or the attempt will fail.

Notes:

a. At default all stations are assigned with day and night COS 0.
b. The Digit Interval Table is empty except for interval 1 where the number range from 0 to 9 is programmed. (Since COS 0 is marked for use with this Table entry CO line calls are possible at all stations at default.)
c. At default, no user is allowed to dial asterisk (*) or pound (#) as the first dialed digit on the CO lines.
d. There are one-hundred (100) Interval Table entries available for programming.
e. System Speed (20-99) Override assigned toll restriction dialing COS.
f. COS ranking affects the station's ability to override a station in DND and to use the Privacy Release feature to join existing conversations.

4.4.108 Tone Detector

4.4.108.1 Description:

When the Option Board is equipped, the system provides one shared tone detector which is 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.

The logical rules for sharing the tone detector are described below :

- 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 telephone number, if 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.

4.4.109 Tone/Inter-digit Duration Selection

4.4.109.1 Description:

Depending on the outside plant environment, type of Central Office, and customer's specialized dialing requirements, the DTMF "on" time and inter-digit time for manually dialed or system automatically dialed digits may be modified. Typically, no modification of tone inter-digit duration is required. However, in some installation environments, where outside plant equipment is becoming antiquated or line conditions are poor, tone duration and/or inter-digit duration timing may be increased to offset these poor conditions. Tone duration and inter-digit duration may be assigned any value 50 ms to 150 ms.

Notes:

a. A longer tone duration or inter-digit duration time will cause a slower output of manual or automatic system-dialed numbers.
b. 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.
c. At default DTMF duration is set to 70 milliseconds.

4.4.110 Transfer

4.4.110.1 Default Setting: 30 Second Ring Transfer Recall Time

4.4.110.2 Related Features:

Call Waiting (Executive Key Telephone)
Recall

4.4.110.3 Related Programming:

CALL HANDLING - RECALL TIME

4.4.110.4 Description:

There are three (3) types of transfer you may use: system-screened (talk transfer), un-screened, and with FP2 the Vodavi (simplified method). When you complete 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.

4.4.110.5 Operation:

Special Note:	Do not press the CLEAR button when processing an incoming call. This will disconnect the call. The telephone will return to idle condition following the transfer operation.

CO Line / Intercom Call Transfer - Unscreened

During a conversation;

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".

CO Line / Intercom Call Transfer - Screened

During a conversation;

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.

Vodavi simplified method:

During a conversation;

1. Press the DSS button of the desired target station.
2. Hang up to complete the transfer.

or

1. Press the TRANS button and dial the two digit station number of the target station.
2. Hang up to complete the transfer.

Vodavi simplified method: (Transfer to Voice Mail)

1. Press the Voice Mail button.
2. Press the DSS of the desired target station.
3. Hang up to complete the transfer.

Vodavi simplified method: (Transfer to Voice Mail) Cont'd

1. Press the Voice Mail button.
2. Dial the two digit station number of the target mailbox.
3. Hang up to complete the transfer.

Notes:

a. The effective ring transfer recall time for any CO line call is programmable, between 16/30/60/90/120 seconds.
b. When a transferred CO line recalls, the line number and station number where the call was transferred will be displayed.
c. Once the outside line changes from "Hold" to "Transfer" status, the outside party will hear Music-on-Hold change to system-provided Ring-back tone (similar to PBX operation).
d. Intercom calls that are transferred follow the Intercom Mode Selection mode at the destination station (VA-Handsfree/Private or Tone Ring).
e. In screened transfer, if the person that you transferred the call to answers your intercom call in Voice Announce Handsfree 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.
f. With voice mail transfers, if NO VM mailbox digits are entered for transfers, no digits are sent to the VM system.
g. If VM mailbox digits are entered for transfers to voice mail, the XFR Prefix digits are sent then the VM mailbox digits are sent, followed by the XFR Suffix digits being sent.

4.4.111 User Name Programming

4.4.111.1 Description:

An alphanumeric, seven-character title may be assigned to each station in the system. This title will be displayed on Executive Key Telephones in place of the standard "STATION" message.

Station user names are programmed in the customer database programming. The names may consist of upper and lower case letters.

4.4.111.2 Related Features:

Various call processing

4.4.111.3 Related Programming:

RESOURCE - USER NAME

4.4.112 Voice Announce Handsfree/Privacy FEAT 9 WXY 8 TUV

4.4.112.1 Default Setting: Voice Announce mode

4.4.112.2 Description:

The Enhanced and Executive key telephone models provide the ability to receive incoming intercom calls in Voice Announce Handsfree mode. When your telephone is in this mode, you can reply to an intercom call by using the speakerphone.

You may also choose to place your telephone in Voice Announce - Privacy mode. In this mode, you can hear the person intercom calling you but your telephone's microphone remains muted so the person calling cannot hear you. Therefore calls may be announced to your station while maintaining a private environment.

4.4.112.3 Programming:

1. Press FEAT.
2. Dial 9 WXY 8 TUV. You will hear three different tones to confirm the three modes of operation: Voice Announce-Handsfree, Voice Announce-Private, and Tone Ring. You will also see visual indications on a button programmed for this feature. On the Executive Key Telephone model the display will show visual indications.

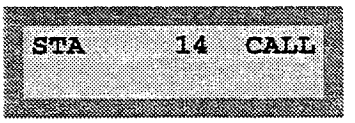
Each time the feature code is dialed, the next mode in sequence is selected, the associated tone is heard and associated visual indications are given. Refer to the table below.

Mode	Button Lamp	Display	Tone Heard
Voice Announce - Handsfree	green lamp	VA-HF MODE	long steady tone
Voice Announce - Private	red lamp	VA-PRIVACY MODE	single burst tone
Tone Ring Mode	no lamp lit	TONE RING MODE	double burst tone

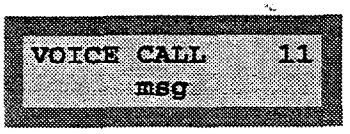
4.4.112.4 Operation:

When your telephone is set for Voice Announce Handsfree mode:

The call is automatically connected and your display shows:



The display at the calling station reads:



Notes:

a. The SPKR button lamp will light during handsfree operation.
b. To receive intercom calls with Handsfree Answer-back, the feature must be enabled.

4.4.113 ‡Voice Mail Integration FEAT 6 MNO 4 GHI

4.4.113.1 Default Setting: None assigned.

4.4.113.2 Related Features:

Call Forward
Hunt Group

4.4.113.3 Related Programming:

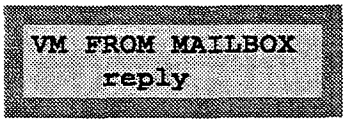
CALL HANDLING - VM DIALING RATIO
SYS APPLICAT - STA HUNT GROUP - VM

4.4.113.4 Description:

A ancillary voice mail device may be connected to the system. You program a button for easy access to this feature. In addition, the button provides an indication of voice messages waiting.

4.4.113.5 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:



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. On Executive Key Telephones, the display will indicate messages waiting in voice mail.

Notes:

a. The Voice Mail system must be programmed to light Voice Mail buttons as follows:

To Turn On the Lamp:
- Dial #96.
- Dial station number.

To Turn Off the Lamp:
- Dial #*96.
- Dial station number.

‡ Voice Mail Integration requires optional ancillary equipment for operation.

b. If you use voice mail regularly, it may be more convenient to program a Programmable Feature Button with the Voice Mail code.

Special Note:	When an answering machine is connected to the system via a 2 Port SLT 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".

4.4.114 Voice Mail Monitor FEAT 6 MNO 4 GHI

4.4.114.1 Default Setting: N/A

4.4.114.2 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.

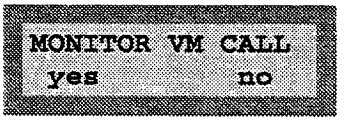
When you forward calls to voice mail, your telephone will alert you when a call is being answered at the voice mail.

4.4.114.3 Operation:

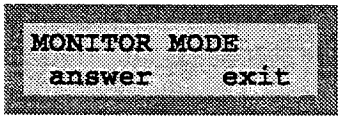
When you hear the alert tone (double beep):
If on a call press HOLD or disconnect (CLEAR) then:

1. Press FEAT.
2. Dial 6 MNO 4 GHI.

An Executive Telephone will display:



3. Press "yes" to monitor the caller leaving a message or "no" to return to idle. (Note: when either "yes" or "no" is selected the caller continues to leave a message, unaware of the monitor feature operation.) If "yes" is selected the display changes to:



4. Monitor mode is established. You may then:
   - Retrieve the caller from Voice Mail by pressing "answer" or,
   - Return to idle and allow the caller to continue leaving a message by pressing "exit"

Basic and Enhanced Telephones - **To Enable Monitoring:**

3. Dial 1. The MUTE lamp will light.
4. Dial 3 DEF to allow the caller to exit or
   dial 1 to be connected to the call.

Basic and Enhanced Telephones - **To Disable Monitoring:**

3. Dial 3 DEF. The telephone returns to an idle condition.

Notes:

a. The feature code may be programmed on a programmable feature button. The green lamp will flash fast to indicate that the Monitor feature is ready.
b. You may press MUTE while monitoring a call to be connected to the caller.
c. When you answer a call the programmed Disconnect Digits table digits are sent to the voice mail port.
d. You will hear the alert tone regardless of whether your telephone is idle or busy or in speakerphone or handset mode.
e. When the new timer "VM MON TIME" expires the opportunity to invoke the feature has past.
f. 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.
g. When you use the Monitor feature, a conference is established between yourself, the voice mail port associated to the call, and the caller leaving the voice mail message.
h. If you are on a call when the Monitor alert tone signals you, you may place the call on hold and then enable the Monitor feature.
i. You may exit the Monitor mode by hanging up the handset, or pressing SPKR, or pressing CLEAR.
j. You may monitor only one call at a time.

4.4.115 Voice Over Busy FEAT 5 JKL 6 MNO

4.4.115.1 Default Setting: Allowed for all stations.

4.4.115.2 Related Features:

Various call processing
Call Waiting

4.4.115.3 Related Programming:

None

4.4.115.4 Description:

If your telephone is busy you may still receive a voice announcement from a calling station. For instance, while you are on the telephone speaking with person A, a person at another telephone on the system (person B) may call you and be heard. Person A will not hear person B's voice announcement to you. Upon receiving the Voice Over Busy, you may choose to speak with person B or reject the Voice Over Busy request.

4.4.115.5 Operation:

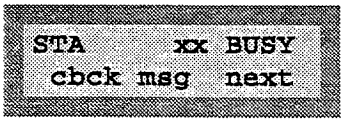
To Place a Voice Over Busy - Basic and Enhanced Telephones:

After dialing a busy station and listening to busy tone:

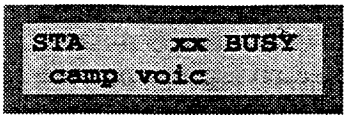
1. Press FEAT.
2. Dial 5 JKL 6 MNO.

To Place a Voice Over Busy - Executive Telephone:

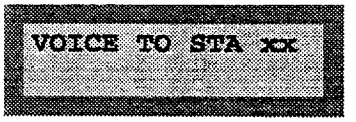
1. Call any busy telephone. You will hear busy tone and your telephone displays:



2. Press "**next**". The display shows:



3. Press "**voice**". The display shows:



If the Voice Over Busy is rejected, the display will read "VOICE REJECTED".

To Accept a Voice Over Busy:

If while listening to the calling party you wish to speak to the Voice Over Busy initiator:

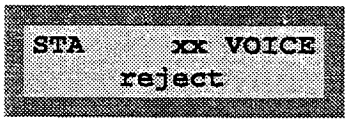
1. Press MUTE. (Use MUTE to switch your transmitter between the original call and the Voice Over Busy initiator.)

To Reject a Voice Over Busy - Basic and Enhanced Telephones:

1. Press FEAT.
2. Dial 5 JKL 6 MNO.

To Reject a Voice Over Busy - Executive Telephone:

The display shows:



Press "**reject**". The display shows:

Notes:

a. Voice Over Busy is not possible when the Call Waiting feature is enabled.
b. Voice Over Busy may be allowed or denied at any station:

   To allow Voice Over Busy calls:

   - Press FEAT.
   - Dial 9 WXY *.

   To deny Voice Over Busy calls:

   - Press FEAT.
   - Dial * 9 WXY *.

c. If you are on a line and have Mute activated, the line will remain muted until the Voice Over Busy is complete.
d. The Voice Over Busy feature code may be programmed on a programmable feature button.

4.4.116 Voice Recorder FEAT 7 PRS 2 ABC

4.4.116.1 Default Setting: N/A

4.4.116.2 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.

4.4.116.3 Operation:

During a conversation:

1. Press FEAT.
2. Dial 7 PRS 2 ABC. An Executive telephone will display "RECORDER SETUP" and then once the Voice Recorder connection is established the display will show; "* RECORDING *".

Notes:

a. 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.
b. Disable the feature at any time by Steps 1 and 2 above or by pressing a Programmed Feature Button.

4.4.117 Volume Control

4.4.117.1 Default Setting: Voice volume is set at level 4.

4.4.117.2 Description:

You can adjust the volume levels for five functions: Background Music, Ringing, Handset, Speaker and Headset. 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 4 (four) volume levels. All other modes allow for 8 (eight) volume levels.

Notes:

a. 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.
b. The Volume Control affects the receive loudness only. The person to whom you are speaking will not detect an increase in volume

4.4.118 Warning Tone

4.4.118.1 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. Related Features:

Drop Time-out

4.4.118.2 Related Programming:

STATION - WARNING TONE, CALL HANDLING - WARNING TIME

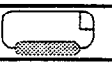
4.4.118.3 Operation:

If a station is set for Warning Tone and the Warning Time is set at 3 minutes, the user will hear Warning Tone when 3 minutes has elapsed. The tone will repeat every 10 seconds until the call is disconnected.

Notes: Not recommended as a "Toll Saver" option (*for specific application use*). Warning Tone is only delivered on outgoing CO line calls.

4.4.119 Feature Access Codes

"F" = FEAT (Features) Key Telephone button

Background Music	F52
Call – Intercom call (2 digits)	10-81
Call - Hunt Group	82-89
Call - Make an outside line call	
Call Back Intercom (idle/busy)	F91
Call Back Intercom Cancel	F*91
Caller ID Unanswered Call Table	F#9
Call Forward Idle	F2+0+ss
Call Forward Busy	F2+1+ss
Call Forward Direct (all modes)	F2+2+ss
Call Forward - Calls From Station ss	F2+3+ss
Call Forward No Answer (x = 0/1/2/3/4)	F2+4+ss+x
♦ Call Forward Busy/No Answer (x = 0-4)	F2+5+ss+x
Call Forward Cancel	F2
Call Transfer (ss = station number)	HOLD +ss+ TRANS
Call Pickup - Directed (ss = station num)	F53+ss
Call Pickup – Group	F54
Call Park by station (ss = station number)	F73+ss
Call Park Answer by CO Line (cc =CO num)	F73+0+cc
Call Waiting -Allow (Executive Stations)	F68
Camp On to busy station	2
Camp On-CO Line	F93
Camp On CO Line Cancel	F*93
Conference	F60
Conference - Talk Privately	F57
Conference - Forced Release	F74
Conference – Unsupervised	F77
Do Not Disturb	F4
Hold - Auto Hold	F94
Hold – Exclusive	F+ HOLD
Hold Retrieve	HOLD
Redial - Last Number Automatic	F78
Redial - Last Number	F8
Redial - Saved Number	F51
Redial - Memo Pad Saved Number	F5*
♦ Line Flash	F#3
Message Waiting - Send	F96

Message Waiting - Cancel	F*96
Message – Executive Notify	F90
Night Serice	F#2
Operator (dial operator station)	0
Page All Stations	F500
Page External - paging speakers	F501
Paging All (Station and External)	F502
Paging by Station Group (g=group number)	F503+g
Page Meet Me Answer	F59
Paging Deny	F99
Pause	F70
Save Number Redial	F51
Speed Dialing	F1+ 00-99
SPEED Dial Program nn=bin#. (00-19)	F1+nn
Station Alarm (Hour/Minute)	F92 + hh/mm
Station Alarm Cancel	F*92
Station Account Code	F71
Station Authority Use	F55
Station Auto Line Select	F95
Station – Distinctive Ringing	F#7
Station - Feature Button Programming	F#3
Station - Feature Check	F#8
Station Headset Mode	F9#
Station Intercom Mode Select (H-T-P)	F98
Station Lock	F97pppp#
Station Unlock	F97pppp*
Station Lock Password change (nnnn = new password)	F97pppp + nnnn
Voice Mail / Voice Mail Monitor	F64
Voice Over Busy (while busy tone is heard)	F56
Voice Over Busy - Allow/Deny	F9*
Voice Recorder	F72
Administration Mode	F#0
Customer Database Programming	F#*

♦ - denotes features that require Feature Package 2 to operate.

5. SINGLE LINE TELEPHONE FEATURES DESCRIPTION & OPERATION

Features described here pertain to single line telephones and any analog device (FAX, modem, cordless phone, etc.) connected to the Starplus DHS via the 2-Port Analog Adapter and 2-Port Analog Expander.

5.1 Rules of Operation:

- When setting or changing feature status, the single line telephone (SLT) will hear confirmation tone, which is a long uninterrupted tone indicating successful operation. The user must go on hook and back off hook before attempting other call processing or feature status changes.
- When setting the feature status, the SLT will receive error tone if the feature access code combination is incorrect.
- When error tone is heard, the SLT must hang up and lift the handset again to attempt any further operation.
- SLT features DND, Call Forward, and Message Waiting (when a Message Waiting indication has been left at the SLT) alert the SLT user that the feature is active by an interrupted (stutter) dial tone.

5.2 Port Numbering

Adding SLT stations to the Starplus DHS has the significant advantage of port-gain. When the SLT interfaces are installed (2-Port SLT Adapter and 2-Port SLT Expansion) the station numbering and available station ports are expanded at a ratio of 2-to-1. When SLT Adapters and Expansions are installed the port numbering is as follows for each digital port connection:

Digital Port	B1 station number	B2 station number
10	10	58
11	11	59
12	12	60
13	13	61
14	14	62
15	15	63
16	16	64
17	17	65

Digital Port	B1 station number	B2 station number
18	18	66
19	19	67
20	20	68
21	21	69
22	22	70
23	23	71
24	24	72
25	25	73

Digital Port	B1 station number	B2 station number
26	26	74
27	27	75
28	28	76
29	29	77
30	30	78
31	31	79
32	32	80
33	33	81

5.3 SLT Feature Access Codes

Call - Make an intercom call (2 digits)	10-81
Call - Hunt Group	82-89
Call - Make an outside line call	9
Call - Make a line call on a specific line	*3+0-9, *, #
Call - Make a line call by line group (x = 0-4)	*4 + x
Call Back Intercom (idle/busy)	#91
Call Back Intercom Cancel	#*91
Call Forward Idle	#2+0+ss
Call Forward Busy	#2+1+ss
Call Forward Direct (all modes)	#2+2+ss
Call Forward - Calls From Station	#2+3+ss
Call Forward No Answer (x = 0/1/2/3/4)	#2+4+ss+ x
Call Forward Busy/No Answer (x = 0-4)	#2+5+ss+ x
Call Forward Cancel	#2
Call Transfer where ss=station number	*F*ss
Call Brokering (ss = station number)	*F*#+ss
Call Pickup - Directed (ss = station number)	#53+ss
Call Pickup - Group	#54
Call Park by station (ss = station number)	#73+ss
Call Park Answer by CO Line (cc =CO num)	#73+0+cc
Camp On to busy station	2
Camp On-CO Line	#93
Camp On CO Line Cancel	#*93
Do Not Disturb	#4
Hold	*F*
Hold Retrieve	*6
Hold Retrieve from another station	*7+ ss
Last Number Redial (with line selection)	#8

Line Flash	*F+#3*
Message Waiting - Send	#96
Message Waiting - Cancel	#*96
Operator (dial operator station)	0
Page All Stations	#500
Page External - paging speakers	#501
Paging All (Station and External)	#502
Paging by Station Group (g=group number)	#503+g
Page Meet Me Answer	#59
Speed Dialing	*1+ 00-99
SPEED Programming where nn=bin#. (00-19)	#1+nn
Station Alarm (Hour/Minute)	#92 + hh/mm
Station Alarm Cancel	#*92
Station Authority Use	#55
Station Hot Line (d=0-9, x=destination)	##4+d+x
Station Lock	#97pppp#
Station Unlock	#97pppp*
Station Lock Password change (nnnn = new password)	#97pppp + nnnn
Voice Mail	#64
Voice Over Busy (while busy tone is heard)	#56
Note: "*F*" represents a Hook Flash.	

5.4 Single Line Telephone Feature Operation

5.4.1 Authority Code [#55]

5.4.1.1 Description:

Any station user may use his own station Class of Service using another station for CO line dialing.

5.4.1.2 Operation:

- Lift handset.
- Dial #55sspppp ("ss" = the station with the desired authority, "pppp" = that station's password.)

5.4.2 Call Brokering

5.4.2.1 Description:

Single Line Telephone (SLT) station users may connect to a second party and alternate between connections. This feature is desirable when a SLT user wants to maintain the connection of the parties and at the same time keep them separate from each other.

5.4.2.2 Related Feature:

Music-On-Hold

5.4.2.3 Related Programming:

CALL HANDLING - SLT HOOK_FLASH

5.4.2.4 Operation:

While engaged on an intercom or CO line call:

- Press Hook Flash. (the original conversation party is placed on hold).
- 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).

5.4.3 Call Hold [Flash]

5.4.3.1 Description:

CO line calls and ICM calls may be placed on Hold.

5.4.3.2 Related Feature:

Music-On-Hold
Hold Reminder
Hold Recall

5.4.3.3 Related Programming:

None

5.4.3.4 Operation:

While connected to a CO line or intercom call press Hook Flash.

Intercom dial tone is heard (the party is placed on hold).

Hang up.

Notes:

a. 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).
b. If Call Abandon is set and properly functioning, calls placed on hold will be released if the outside party disconnects.
c. To answer Hold Recall at an SLT, lift the handset.

5.4.4 Call Hold Retrieve [*6]

5.4.4.1 Description:

Since multiple calls may be placed simultaneously at an SLT, the Call Hold Retrieve feature may be used to access a call previously placed on Hold.

5.4.4.2 Operation:

When the SLT user wishes to retrieve a held call, lift the handset.

ICM dial tone is heard.

Dial *6.

Talk with the original held party.

If no intercom/CO line call has been placed on hold by the user or if the line on hold has been picked up elsewhere;

Lift handset (intercom dial tone is heard).

Dial *6. Error Tone is heard.

5.4.5 Call Hold Retrieve Other Station[*7]

5.4.5.1 Description:

This feature is used to access CO lines that are placed on hold at other stations.

5.4.5.2 Operation:

To pick up a held call at another station;

- Lift handset.
- Dial *7.
- Dial station number where call is holding.

Note: If no CO Line call is holding at that station error tone is heard.

5.4.6 Call Operator (Call Attendant) [0]

5.4.6.1 Description:

The system Attendant station may be easily called by one dialed digit code. At default this code is "0".

5.4.6.2 Related Feature:

None

5.4.6.3 Related Programming:

CALL HANDLING - OPERATOR CODE

5.4.6.4 Operation:

- Lift handset.
- Dial 0.

Notes:

a. The code dialed for the system attendant (0 or 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.
b. The Operator access code (0/9) is mutually exclusive with the outside CO line access code.

5.4.7 Call Transfer [Flash+ss]

5.4.7.1 Description:

To transfer a call from your station to another station.

5.4.7.2 Operation:

While connected to current call;

- Press Hook Flash.
- Dial Station number.
- Hang up to complete the transfer.

Notes:

a. When a CO line call is transferred the system rings the new station with external ring signal.
b. When transferring a call the held internal party becomes the new calling party and hears Ring-back tone.
c. CO Line Call Transfer is allowed for idle or busy transfers.
d. A SLT cannot transfer a CO line call to a station that is in DND.

5.4.8 Do Not Disturb (DND) [#4]

5.4.8.1 Description:

SLT stations may place their telephones in DND mode to avert incoming calls.

5.4.8.2 Related Feature:

DND Override

5.4.8.3 Related Programming:

None

5.4.8.4 Operation:

Calls to a station in DND will hear DND Tone.

5.4.8.5 Setup:

To set DND:

- Lift handset.
- Dial #4.

To cancel:

- Lift handset.
- Dial #4.

Notes:

a. 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.
b. When a SLT is in DND, DSS button LED's at other stations will flash.

5.4.9 Call Forward [#2]

5.4.9.1 Description:

The SLT user may forward telephone calls to another station, VM or Hunt Group using four call type criteria. The SLT user may also use Follow Me Forward to extend calls at another station to this station.

5.4.9.2 Operation:

Calls to this station will follow the forward scheme selected.

5.4.9.3 Setup:

- Lift handset.

For Idle Call Forward;

- Dial #20xx (where "xx" is the destination desired).

For Busy Call Forward;

- Dial #21xx (where "xx" is the destination desired).

For Direct Call Forward;

- Dial #22xx (where "xx" is the destination desired).

For No Answer Call Forward;

- Dial #24xxt (where "xx" is the destination desired and "t" is the Time to ring before forwarding: 0 = 10 seconds, 1=20 seconds, 2=30 seconds, 3=40 seconds and 4=50 seconds.).

For Busy/No Answer Call Forward;

- Dial #25xxt (where "xx" is the destination desired and "t" is the Time to ring before forwarding in the no answer scenario: 0 = 10 seconds, 1=20 seconds, 2=30 seconds, 3=40 seconds and 4=50 seconds.).

For Follow Me Call Forward;

- Dial #23sspppp (where "ss" is the station number to forward to this location and "pppp" is the password of the station to forward.).

5.4.9.4 To cancel Call Forward:

- Lift handset.
- Dial #2.

5.4.10 Intercom Calling

5.4.10.1 Operation:

- Lift handset.
- Dial the desired station, Hunt Group or VM Group number.

5.4.11 Speed Dialing [*1]

5.4.11.1 Operation:

- Lift handset.
- Dial *1.
- Dial SPD bin number to dial.

5.4.11.2 Setup:

- Lift handset.
- Dial #1.
- Dial SPD bin for programming. Station Speed Dial bins range from 00-19.
- Enter the desired outside phone number.
- Press Hook Flash. (Confirmation Tone is heard.)

Notes:

a. When speed dialing, either private speed dial number or system speed dial number is allowed.
b. Usage of System speed dial numbers is based on SLT's Class of Service assignment.

5.4.12 CO Line Access [9/0]

5.4.12.1 Description:

CO line access is simplified at an SLT by dialing a CO line access code. The code may be 9 or 0, depending on Database Programming. CO line group access codes are also available. Refer to the SLT Numbering Plan for additional information.

5.4.12.2 Related Feature:

Call Operator (Call Attendant) [0]

5.4.12.3 Related Programming:

CALL HANDLING - OPERATOR CODE

5.4.12.4 Operation:

To access any idle CO line:

- Lift handset.
- Dial 9.

To access a specific CO line:

- Lift handset.
- Dial *3c (where "c" is the CO line number/code for the desired CO line.
  1-9 = CO lines 1-9, 0 = CO line 10, * = CO line 11 and # = CO line 12.).

To access any idle CO line in a specific CO line group:

- Lift handset.
- Dial *4g (where "g" is the CO Line Group number desired. Groups are 0 - 4. "0" is any group.).

Notes:

a. An SLT station may dial access any CO line that has been allowed in database programming.
b. The dial codes "9" and "0" are mutually exclusive. When one or the other is programmed as the Operator Code the remaining is assigned for out dialing at SLT stations. Dial access 9/0 will access the highest available line regardless of line groups.
c. 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.

5.4.13 Call Park Answer [#73]

5.4.13.1 Operation:

- Lift handset.
- Dial #73 + 0 + c (where "c" is the CO line number/code for the desired CO line.
  1-9 = CO lines 1-9, 0 = CO line 10, * = CO line 11 and # = CO line 12.)

or...

- Lift handset.
- Dial #73 + sn (where "sn" is the Station Number)

5.4.14 Call Pickup (Direct) [#53]

5.4.14.1 Description:

Ringing calls at unattended stations may be retrieved using the Direct Pick-Up code.

5.4.14.2 Operation:

- Lift handset.
- Dial #53sn (where "sn" is the Station Number).

5.4.15 Call Pickup (Group) [#54]

5.4.15.1 Description:

Ringing calls at unattended stations may be retrieved via the Group Pick-Up code, assuming that the station invoking the feature is in the same Station Group as the ringing station.

5.4.15.2 Operation:

- Lift handset.
- Dial #54.

5.4.16 Camp On Busy Station [2]

5.4.16.1 Operation:

When the called station is busy;

- Dial 2 (while listening to Busy Tone).

5.4.17 Camp On Busy CO Line [#93]

5.4.17.1 Description:

A SLT station may Camp On to a busy CO line.

5.4.17.2 Operation:

When a CO line access attempt results in Busy Tone

- Dial #93 (while listening to busy).

To cancel the CO line Camp On,

- Lift handset.
- Dial #*93.

5.4.18 Station Alarm [#92]

5.4.18.1 Description:

A SLT may instruct the system to ring the telephone at a predetermined time for use as a reminder. (Note: Station Alarm setting is cancelled after each use.)

5.4.18.2 Setup:

- Lift handset.
- Dial #92hhmm (where "hh"=the hour in military format and "mm"=the minute).

To cancel:

- Lift handset and dial #*92.

5.4.19 Intercom Call Back [#91]

5.4.19.1 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.

5.4.19.2 Operation:

When listening to Busy Tone after dialing a station number;

- Dial #91.

To cancel:

- Lift handset and dial #*91.

5.4.20 Last Number Redial [#8]

5.4.20.1 Operation:

- Lift handset.
- Dial #8.

5.4.21 Line Flash [#3]

5.4.21.1 Operation:

- While connected to a CO/PBX line.
- Press flash.
- Dial #3.

5.4.22 Message Waiting (Send/Respond)[#96]

5.4.22.1 Operation:

To leave a message at any telephone:

- Lift the handset and dial #96ss (where "ss"= the station number where the message is to be left.).

To cancel a message that was previous left:

- Lift the handset and dial #*96ss.

5.4.23 Paging [#50]

5.4.23.1 Operation:

- All Call Internal - Lift handset + #500.
- External Paging Only - Lift handset + #501.
- System All Call Paging - Lift handset + #502.
- Group Paging (Zones) - Lift handset + #503g (where "g" = Station Group 1-8).

5.4.24 Meet Me Page [#59]

5.4.24.1 Operation:

- When a page announcement is heard, lift the handset and dial #59.

5.4.25 Phone Lock/Unlock - Password Change[#97]

5.4.25.1 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 four-digit password.

5.4.25.2 Setup:

- Lock - lift handset and dial #97pppp# (where "pppp" is the current password).
- Unlock - lift handset and dial #97pppp* (where "pppp" is the current password).
- Change Password - lift handset and dial #97pppp + new four digit password (where "pppp" is the current password).

5.4.26 SLT Hot Line [##4]

5.4.26.1 Default Setting:

5.4.26.2 Description:

This feature allows you to use the associated single line telephone (SLT) port for automatic signaling to a predetermined destination. When the feature is enabled, the destination will be signaled whenever that SLT goes off-hook.

You may hook-flash at the SLT 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, a hunt/voice mail group, a paging zone, a CO line, or a CO line group.

5.4.26.3 Programming (establish setting):

- Lift the handset.
- Dial ##4.
- Dial the delay time (0-9 seconds).
- Dial the destination code. You may choose from the following:

  #500 (Internal All Call Paging)
  #501 (External Paging)
  #502 (System All Call Paging)
  #503n (Internal Paging by station group where n = station group 1-8)
  *1nn (nn = speed dial bin 00-99)
  3n (n = the CO line number 1-9,0,,#)
  *4n (n = the CO line group number or "0" if any group)
  10-89 (station/hunt group number)

5.4.26.4 Cancel setting:

- Lift the handset.
- Dial ##4.

5.4.26.5 Operation:

- Go off-hook and wait for the delay time to expire.

Notes:

a. Operation of Hot Line to a station, speed dial bin or CO line that is not valid or programmed results in error tone as it would if dial accessed.
b. If the CDB programming parameter SYSTEM TYPE is set to "KEY" you will hear error tone if the Hot Line feature is set for a CO line group.
c. If the SYSTEM TYPE was set to "PBX" but later changed to "KEY", operation of Hot Line to a CO line group will not be allowed when you setup CO line group operation.

6. INSTALLATION

6.1 Installation Outline

(1) Plan the installation, including the Key Service Unit (KSU) and main distribution frame (MDF) location, station locations, cable runs, and optional equipment.

(2) Run cables to the key telephone and single-line telephone locations from the MDF to each location. (Wiring topology is referred to as Star-Wiring configuration. No cable should loop from one telephone location to another.)

(3) Run wiring to any optional equipment, such as external paging equipment, loud bell signaling devices, music sources, etc.

(4) Mount the MDF backboard and attach the punch-down terminal block(s) on the backboard.

(5) Terminate station cables on punch-down terminal block(s) on the MDF.

(6) Terminate station cables on modular jack assemblies at the station locations.

(7) Mount the KSU on the MDF backboard. Use the provided mounting template to aid in spacing the mounting screws.

(8) Install optional 3X8 Expansion Modules inside the KSU as required.

(9) Install the Option Module if required.

(10) 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.

(11) Route ancillary device cabling through the appropriate KSU opening and terminate as required (music source, printer/computer for SMDR, external paging equipment, etc.)

(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 single line telephones.

(14) **Operate the RAM memory initialization switch from its factory set "OFF" (toward left) position to the "ON" (toward right) position. Very important notice: if the RAM Initialization switch was not in the "OFF" position prior to this installation. It must be moved to the "OFF" position and allowed to stay in the "OFF" position for 2 minutes while the system is NOT powered. This critical step is detailed in the "Power Up Initialization" topic at the end of this chapter.**

(15) Plug the AC power cord into the dedicated AC outlet and power up by operating the AC power switch to the on position.

(16) Observe the power/CPU heartbeat LED for flashing status after 4-6 seconds.

(17) Refer to the Database Programming section of this manual to program the system.

6.2 Pre-Installation Checklist

To make installation easier, use the checklist on the following pages when preparing to install the system. (Hardware specifications are included in the SPECIFICATIONS section.)

6.2.1 Establish Suitable Environmental Conditions for the System:

- Place the KSU within 5 feet (1.5 meters) of an isolated, dedicated, 105-125VAC, 57-63Hz, 15A, single-phase commercial power source.
- **NOTE:** This must be an isolated, dedicated AC circuit for proper operation. All three wires (power, neutral, and ground) must be run separately from the outlet to the breaker panel without being bonded to any other wire or circuit. Do not plug any other equipment into this outlet. To maintain the protection provided by the isolated, dedicated circuit, the length of the AC power cord limits the distance between the KSU and the outlet; **Do not use an extension cord.**
- To protect the system from lightning damage or other AC power line disturbances, a surge protector should be installed.
- Select the KSU location to minimize cable run length. Station instruments connected to the system must not exceed specified limits (using 26AWG wire).
- The KSU location should not be exposed to direct sunlight, high humidity, heat, dust, or strong magnetic fields (such as those generated by heavy motors, copy machines and some kitchen appliances).
- The MDF should consist of a 3/4-inch plywood backboard large enough to mount all hardware and equipment allowing all components ample space for adequate ventilation and servicing. Allow additional room for external apparatus, if used.
- For cooling purposes, ample air space (at least four inches on the top, bottom, and left and right sides) should be provided for the KSU.
- SMDR/SMDA output device(s) must be placed within 50 feet (15 meters) of the KSU (limited by RS-232C standard wiring practices).
- The equipment should be located in a climate-controlled room adhering to the Environmental Specifications listed in the Specifications section.
- **NOTE:** When installing the KSU and station instruments, allow a sufficient margin for error in case of air conditioning failure, routine maintenance, plant shutdown, etc. As a general rule, if conditions are suitable for office personnel, they are also suitable for KSU and station instrument operation. A properly controlled environment will help to extend the operating life of the equipment.

From UL 1459, a product safety specification governing telephone equipment:

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch non-insulated telephone wires or terminals unless the telephone line has been disconnected at the network's interface.
- Use caution when installing or modifying telephone lines.

6.2.2 Assembling the Necessary Tools and Supplies:

- Use unshielded, twisted multi-pair (three pair 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.
- Six conductor modular jack assemblies for all station instruments (recommended).
- Standard punch-down terminal block(s) (66M1-50 type) as required.
- Industry-standard, 25-pair cable(s) with a 50 pin **male** Amphenol/AMP type connector for connection from each equipped 3X8 module to the MDF.
- 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.

6.3 Preparing the Main Distribution Frame:

The Main Distribution Frame (MDF) is the point at which the KSU, station instruments, CO lines, and miscellaneous equipment are connected to one another. It is extremely important that the connections be made carefully and accurately.

6.3.1 Assemble the MDF as follows:

1. Mount a sufficiently sized 3/4-inch plywood backboard at the proper location for use as the MDF.
2. Plan the layout of all required MDF components allowing for expansion.
3. Locate the Telco provided CO/Centrex lines at the demarc and extend them to the MDF location.

6.3.2 KSU Installation

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

Basic KSU

1 mounting template

1 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.

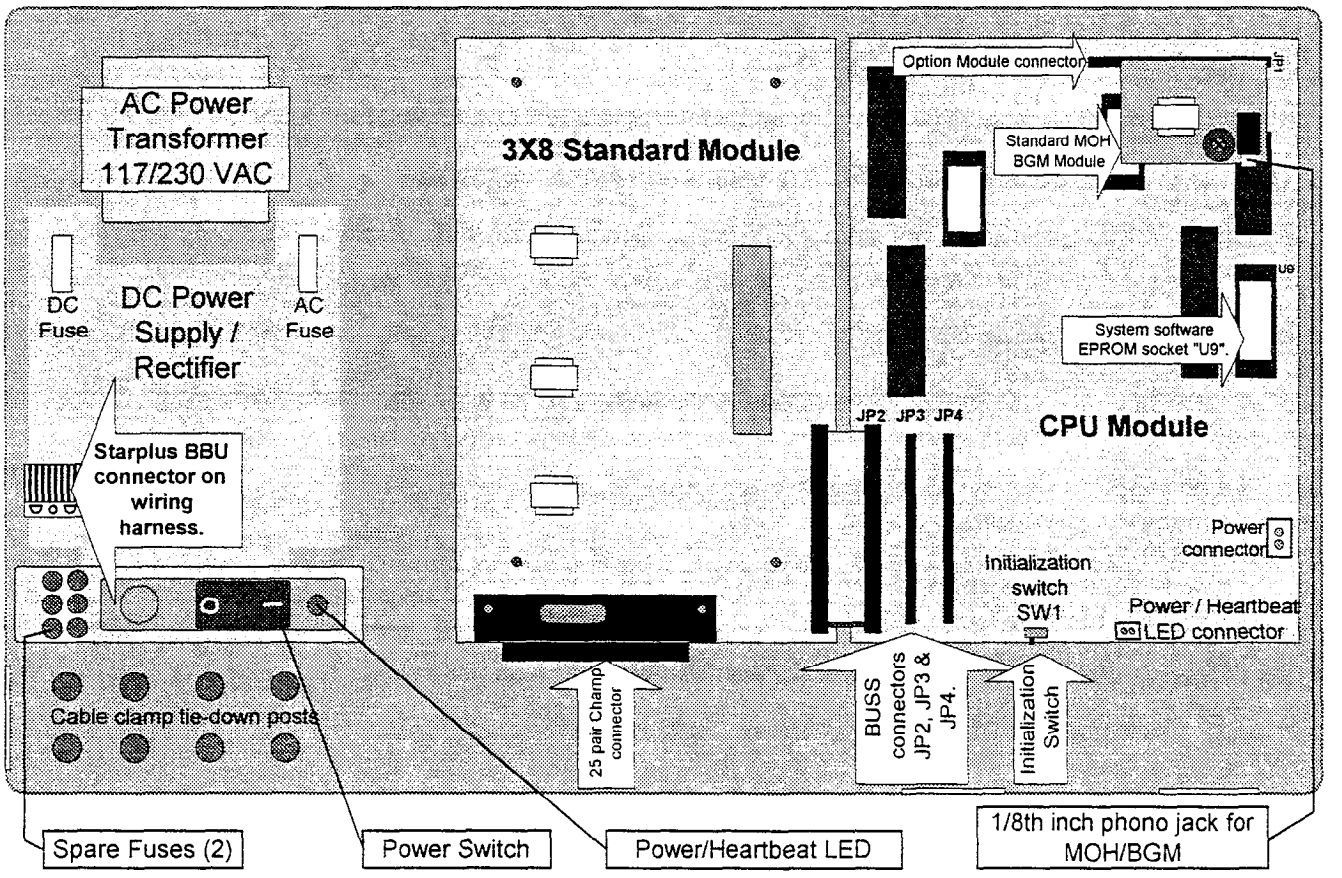
6.3.3 Mounting the KSU

1. Using the mounting template as a guide, mark the two (2) mounting screws locations on the MDF backboard.
2. Pre-drill two (2) screw holes and install two, H inch, pan-head No. 10 screws into the backboard with a regular screwdriver. The screw heads should protrude about 1/4-inch from the backboard plywood surface.
3. Lift the KSU over the two 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.

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

6.4 KSU Components

Basic KSU
(Configured for 3 CO lines and 8 Digital Stations)



6.4.1 Standard 3X8 Module:

The Standard 3X8 Module (factory installed in the Basic KSU) requires one (1) 25 pair Amphenol type (male) ended station cable to extend the interface ports to the MDF. The station cable is plugged into the female Amphenol connector at the base (orientation assumes a properly mounted KSU) of the Standard 3X8 Module. **Note: System power should be OFF before plugging in the station cable or while working on the station punch-down block. (Although each port is over-current protected, unnecessary shorting should be avoided.)**

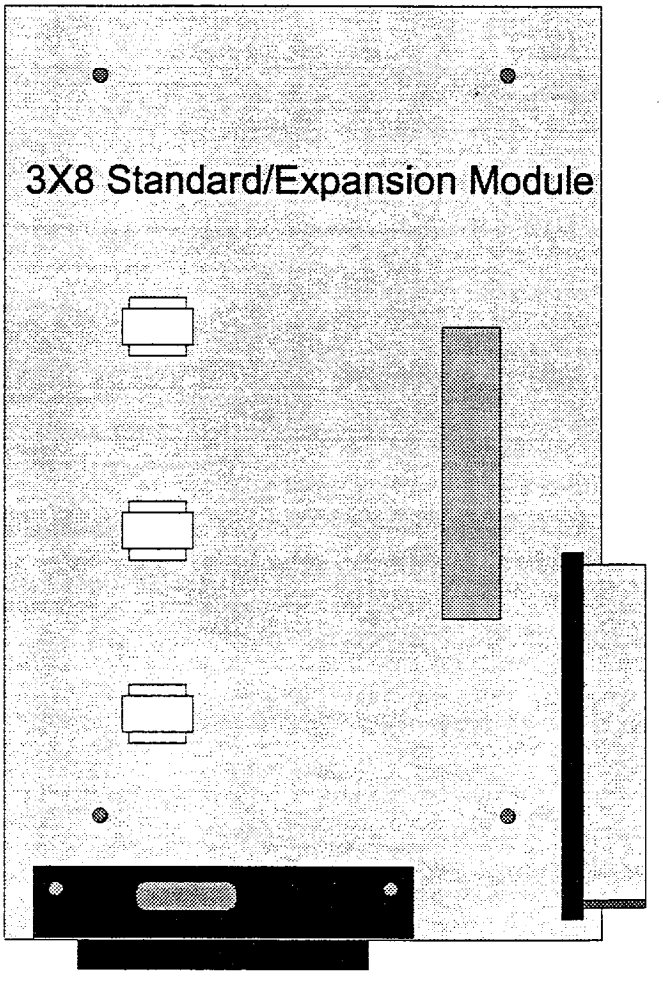
The cable is then routed out of the KSU through an opening at the lower left of the KSU housing. A cable restraint clamp is provided and may be used to secure cables exiting the KSU. The 25 pair cable is then terminated on a punch-down terminal block on the MDF for interconnection. See the punch-down terminal block wiring diagram for Standard 3X8 Module & 3X8 Expansion Module cable pair designations.

6.4.2 3X8 Expansion Module

The 3X8 Expansion Module is installed to expand system capacity and is housed in the KSU in stacking fashion over the Standard 3X8 Module. Two 3X8 Expansion Module maximum can be installed in the KSU. The 3X8 Expansion Module is shipped with 4 stand-off mounting posts.

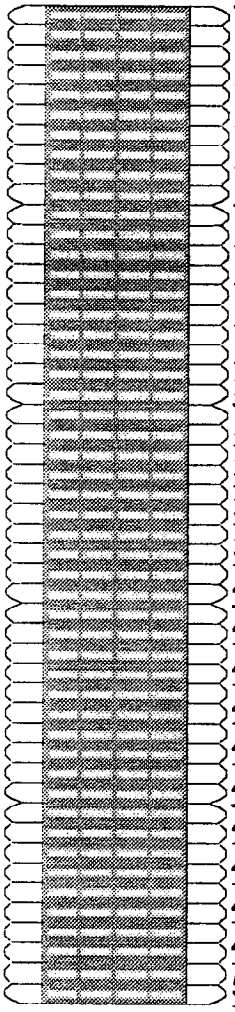
Follow these steps when installing a 3X8 Expansion Module:

1. Be sure that KSU power is turned off.
2. Remove the KSU cover.
3. Connect grounded wrist strap to a suitable earth ground.
4. Locate the screws used to secure the 3X8 module or 6 Port CO Module already in place.
5. Remove one of module securing screws only. (So that the existing board stays in place.)
6. Retain the screw removed in step 2.
7. Insert one of the stand-off posts into the screw position where the screw from step 2 was removed.
8. Tighten securely by hand, then snug tight using a small hand tool. It is very important not to over-tighten any screw or stand-off post as damage to the board may occur.
9. Repeat steps 4 through 8 until all module screws are replaced with stand-off posts.
10. Position the 3X8 Expansion Module over the stand-off posts installed and use the screws removed in the previous steps to secure it in place on the stand-off posts.



11. Once mounted, carefully insert the BUSS Ribbon Cable into the next available Expansion BUSS Connector on the CPU board.
12. Replace KSU cover and secure with cover screws.
13. Restore KSU power when all wiring is complete.

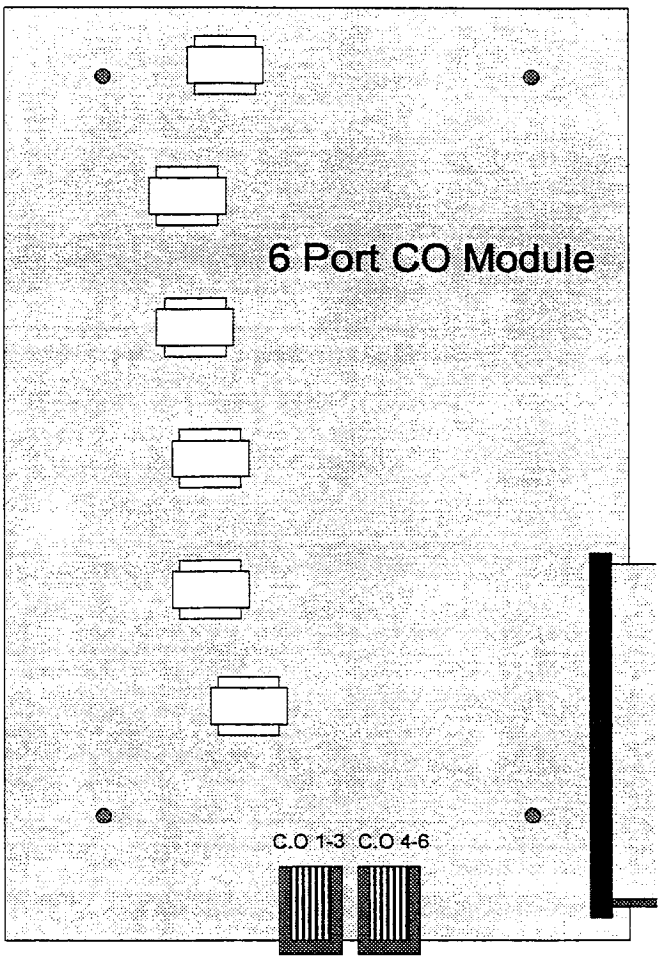
66M1-50 wiring designations for 3X8 Modules



CA Pair	Pair Color	Designation	Standard 3X8 Module	1st 3X8 Expansion Module	2nd 3X8 Expansion Module
26/1	White/Blue	n/c			
27/2	White/Orange	CO Line Port 3	CO 3	CO 6	CO 9
28/3	White/Green	CO Line Port 2	CO 2	CO 5	CO 8
29/4	White/Brown	CO Line Port 1	CO 1	CO 4	CO 7
30/5	White/Slate	n/c		Not applicable when the 6-Port CO Module is installed in this position.	Not applicable when the 6-Port CO Module is installed in either Expansion Module position.
31/6	Red/Blue	n/c			
32/7	Red/Orange	n/c			
33/8	Red/Green	n/c			
34/9	Red/Brown	n/c			
35/10	Red/Slate	n/c			
36/11	Black/Blue	n/c			
37/12	Black/Orange	n/c			
38/13	Black/Green	n/c			
39/14	Black/Brown	n/c			
40/15	Black/Slate	n/c			
41/16	Yellow/Blue	n/c			
42/17	Yellow/Orange	n/c			
43/18	Yellow/Green	Station Port 1	STA 10	STA 18	STA 26
44/19	Yellow/Brown	Station Port 2	STA 11	STA 19	STA 27
45/20	Yellow/Slate	Station Port 3	STA 12	STA 20	STA 28
46/21	Violet/Blue	Station Port 4	STA 13	STA 21	STA 29
47/22	Vilet/Orange	Station Port 5	STA 14	STA 22	STA 30
48/23	Violet/Green	Station Port 6	STA 15	STA 23	STA 31
49/24	Violet/Brown	Station Port 7	STA 16	STA 24	STA 32
50/25	Violet/Slate	Station Port 8	STA 17	STA 25	STA 33

6.4.3 6 Port CO Module:

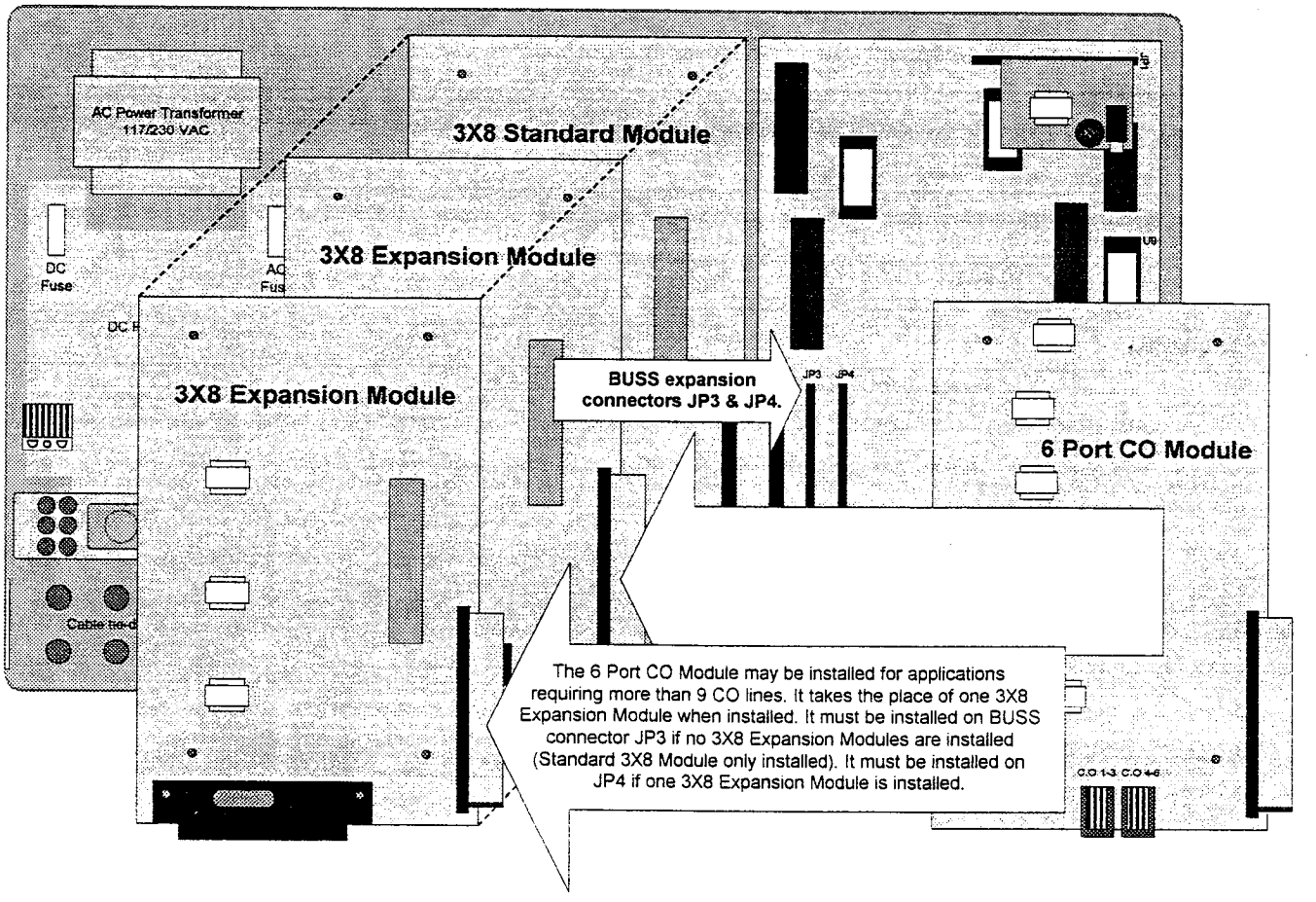
The 6 Port CO Module is installed to increase system capacity of CO lines. The 6 Port CO Module is shipped with two 6 conductor cords, two surface mount modular jacks and four stand-off posts. Regardless of how many 3X8 modules are installed, only one 6 Port CO Module may be installed. The 6 Port CO Module must be the last module installed. That is; if a 6 Port CO Module is first installed as the first Expansion Module (JP3) and a 3X8 Expansion Module is then installed at a later date, the 6 Port CO Module must be moved to the last expansion position (JP4). Follow these steps when installing the 6 Port CO Module:



1. Be sure that KSU power is turned off.
2. Remove the KSU cover.
3. Connect grounded wrist strap to a suitable earth ground.
4. Locate the screws that secure the 3X8 module already in place.
5. Remove one of module securing screws only. (So that the existing board stays in place.)
6. Retain the screw removed in step 5.
7. Insert one of the supplied stand-off posts into the screw position where the screw from step 5 was removed.
8. Tighten securely by hand, then snug tight using a small hand tool. It is very important not to over-tighten any screw or stand-off post as damage to the board may occur.
9. Repeat steps 5 through 8 until all module screws are replaced with stand-off posts.
10. Position the 6 Port CO Module over the stand-off posts installed and use the screws removed in that process to secure it in place on the stand-off posts.
11. Once mounted, carefully insert the BUSS Ribbon Cable into the next available Expansion BUSS Connector on the CPU Module. When the Option Module is installed it is necessary to remove the Option Module screws and lift the Option Module away from the CPU Module for clear access to the CPU Module BUSS Connectors (JP3 & JP4).
12. Replace KSU cover and secure with cover screws.
13. Restore KSU power when all wiring is complete.

Special Note:	The 6 Port CO Module must be installed in the last available Expansion Buss Connector on the CPU Module. That is, if a 6 Port CO Module is installed on JP3 a 3X8 Expansion Module will not function if installed on JP4. So, if a 3X8 Expansion Module is added after a 6 Port CO Module was previously added, the 6 Port CO Module must be removed from JP3, the new 3X8 Module installed to JP3 and the 6 Port CO Module reinstalled onto JP4.

KSU Expansion Module Installation



6.4.4 Option Module

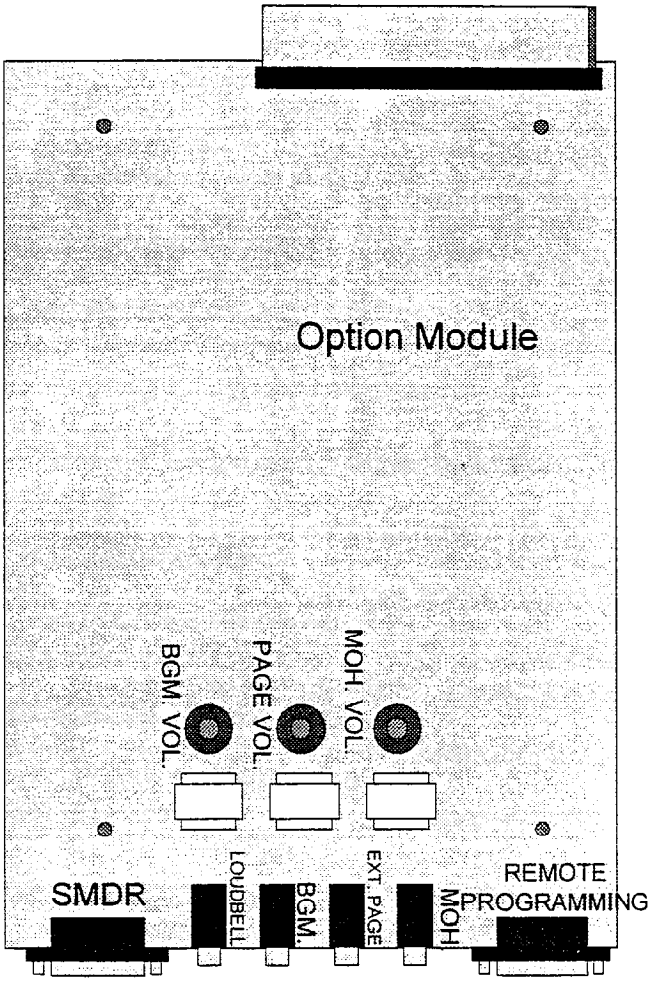
The Option Module is installed to facilitate advanced call processing features like External Call Forward, Automatic Busy Redial, etc. (Generally, features that require enhanced call monitoring via Tone Detectors and DTMF receivers.) The Option Module is equipped with two DTMF receivers and two Tone Detectors. In addition the Option Module provides two music source inputs (one that replaces the Standard MOH/BGM Module), one external page zone port and one Loud Bell Control contact.

Follow these steps when installing the Option Module:

1. Be sure that KSU power is turned off.
2. Remove the KSU cover.
3. Connect grounded wrist strap to a suitable earth ground.
4. Locate the Standard MOH/BGM Module already in place. Notice that there is one screw that secures the Standard MOH/BGM Module to the CPU Module.
5. Remove the MOH/BGM Module screw and MOH/BGM Module. Then remove the short stand-off post used to mount the Standard MOH/BGM Module.
6. Retain these pieces in the event that the Option Module is to be eliminated and standard MOH/BGM operation is again desired.

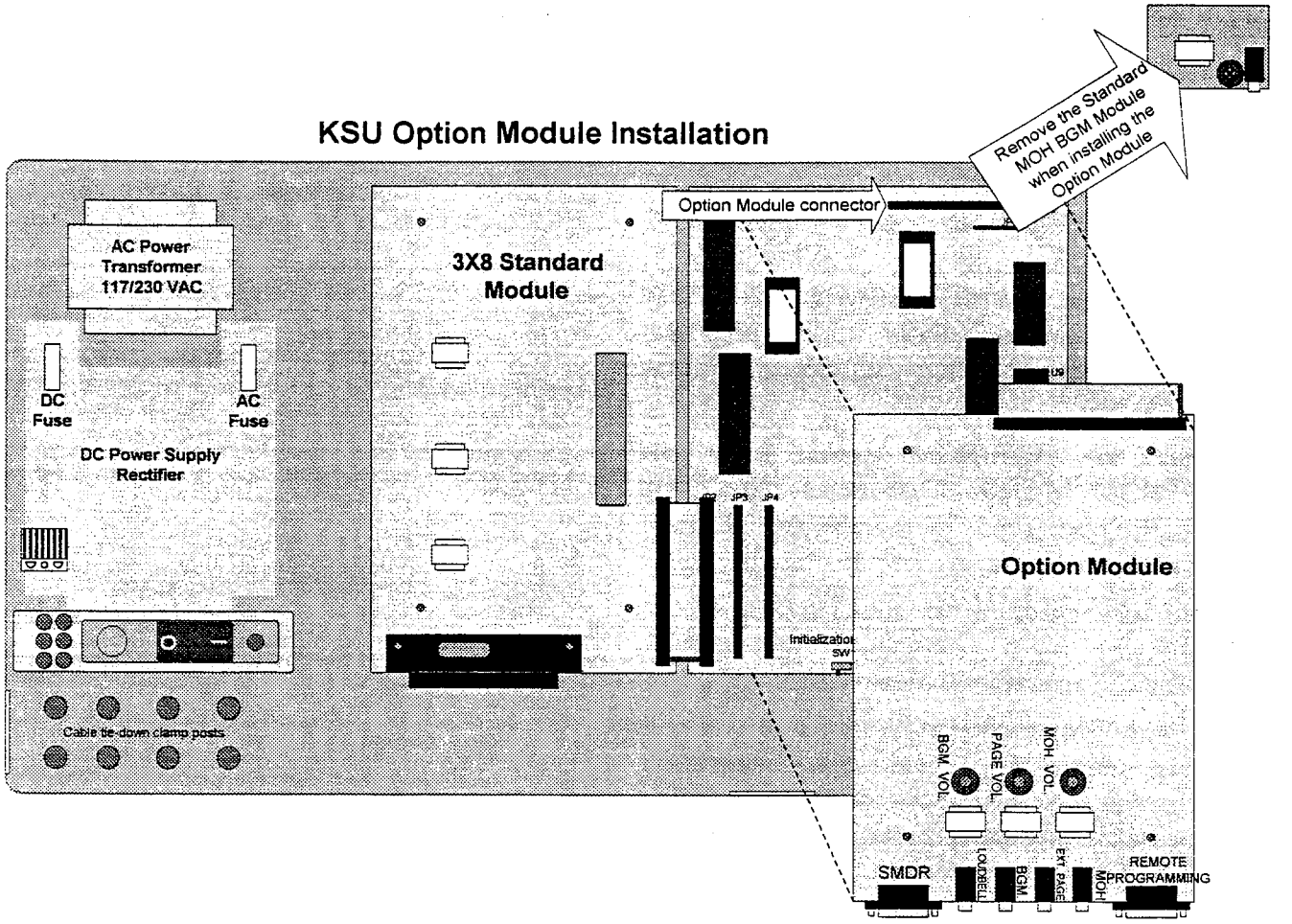
NOTE: The Standard MOH/BGM Module is NOT a separately stocked replacement part. To replace a Standard MOH/BGM Module a Basic KSU must be purchased!

7. Install one of the stand-off posts supplied with the Option Module into the position previously occupied by the short stand-off post. Use step 11 as a guide for tightening the stand-off post. Locate the remaining three screws used to secure the CPU Module.

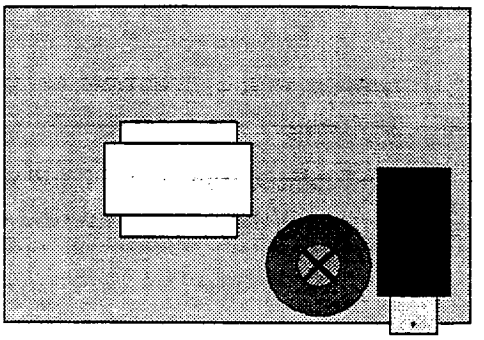


8. Remove one of the module securing screws at a time. (So that the CPU Module stays in place.)
9. Retain the screw removed in step 5.
10. Insert one of the Option Module stand-off posts into the screw position where the screw from step 5 was removed.
11. Tighten securely by hand, then snug tight using a small hand tool. It is very important not to over-tighten any screw or stand-off post as damage to the module may occur.
12. Repeat steps 8 through 11 until all module screws are replaced with stand-off posts.
13. Position the Option Module over the stand-off posts installed such that the ribbon cable and connector are oriented at the top right of the module (Assuming correct KSU installation.)

14. Locate the Option Module connector located on the CPU Module labeled "JP1" and carefully attach the Option Module ribbon cable to JP1 assuring that all connector pins are properly aligned. It is very important that all pins make contact to the connector and that no pins become bent in this process.
15. Use the screws retained in step 9 to secure the Option Module to the stand-off posts installed.
16. Replace KSU cover and secure with cover screws.
17. Restore KSU power when all wiring is complete.



6.4.5 Standard MOH/BGM Module



The Standard MOH/BGM Module is shipped with the Basic KSU and will never likely be reinstalled if ever removed. In the event that the Option Module was installed and the Standard MOH/BGM Module is to be re-installed, follow these steps:

1. Turn off KSU system power.
2. Remove the KSU cover.
3. Connect grounded wrist strap to a suitable earth ground.
4. Locate the four screws used to secure the Option Module to the Option Module stand-off posts.
5. Remove each screw carefully to assure that no damage to the Option Module results when the last screw is removed. Retain these screws.
6. Lift the Option Module away form the CPU Module and unplug the Option Module ribbon cable from the Option Module connector (JP1) of the CPU Module.
7. Locate the four Option Module stand-off posts.
8. Remove the upper right stand-off post and replace with the Standard MOH/BGM Module stand-off.
9. Remove each of the other stand-off posts one at a time and replace with the screws removed in step 5.
10. Carefully push the Standard MOH/BGM Module connector onto the MOH/BGM connector (JP5) on the CPU Module.
11. Use one of the screws removed in step 5 to secure the Standard MOH/BGM Module in place.
12. Replace KSU cover and secure with cover screws.
13. Restore KSU power.

6.5 Grounding Requirements

The KSU must be properly grounded. The power cord third-wire ground is sufficient for this KSU. DO NOT use a three-wire to two-wire adapter when connecting AC power as the AC cord third-wire ground is the only KSU ground source. Test the AC receptacle for proper wiring and presence of ground.

***NOTE**: According to UL 1459, "the attachment-plug receptacle in the vicinity of the product or system are all to be of a grounding type, and the grounding conductors serving these receptacles are to be connected to earth ground at the service equipment."*

6.6 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 surge/spike protector be installed. Check the manufacturer's specifications to ensure that the device meets the following requirements:

- Clamp voltage transients at 300 volts within 5 nanoseconds when exposed to wave-forms as described in the ANSI/IEEE Standard C62.41-1980 (IEEE 587).
- Reduce RFI/EMI noise by at least 20dB at frequencies between 5kHz and 30MHz.

6.7 230VAC Operation

When installing the KSU in a location that will use a 230VAC power source it is necessary to strap the AC power transformer for 230VAC operation. The transformer is equipped with three primary winding tap leads colored Red, Brown and Black. The Black and Brown leads are used for 117VAC operation. (This is the factory wired configuration.) The Black and Red leads are used for 230VAC operation.

Use the steps below to make the 230 volt AC field strap adjustment:

1. Make sure that the KSU power switch is turned off and that the KSU power cord is not connected to any AC power receptacle.
2. Since the KSU is shipped configured for 117VAC operation, locate the Brown power transformer lead and cut it mid-way between the power transformer and the KSU power switch.
3. Tape (or otherwise insulate) and store the brown lead extending from the power transformer.
4. Strip approximately 10 mm (half-inch) of insulation from the end of the remaining portion of the Brown lead (going toward KSU power switch).
5. Locate the factory insulated Red transformer lead and cut the insulated tip off.
6. Strip approximately 10 mm (half-inch) of insulation from the end of the remaining portion of the Red lead.
7. Using an appropriate splice connector (wire-nut, etc. in conformance to local electrical code), join the Red and Brown leads and insulate.

6.8 Connecting CO Lines

6.8.1 CO lines connections for the 3X8 Standard and 3X8 Expansion Module(s):

1. The CO line connections (as well as station connections) are made to the 3X8 Standard Module and Expansion Module(s) via the 25 pair connector located along the bottom edge of the installed module. (Refer to the illustrations in the table for cable pair designations.)
2. Once the 25 pair cable is terminated on an industry standard 66M1-50 block, cross-connect (jumper wire) should be used to extend the CO line pair from the terminal block to the Telco Demarcation

block. Plan to use at least one pair of bridging clips for each CO line connected so that service of any one specific CO line is simplified.

6.8.2 CO lines connections for the 6 Port CO Module.

1. CO line interface to the 6 Port CO Module is made through two RJ25 type modular connectors on the 6 Port CO Module located along the bottom edge of the installed module. CO line ports 1-3 of the 6 Port CO Module are connected through RJ25 connector "CO 1-3" (positioned toward the left/center of the installed module) and ports 4-6 of the 6 Port CO Module are connected through RJ25 connector "CO 4-6" (positioned toward the right/center of the installed module).
2. The 6 Port CO Module is shipped with two 3-pair line cords and two 3-pair terminal blocks for connection on the MDF. Once terminated the individual pairs of the 3-pair terminal blocks are extended to the Telco Demarcation block. Plan to use at least on pair of bridging clips for each CO line connected so that service of any one specific CO line is simplified.

6 Port CO Module jack	Module jack pin	Cable Pair (if applicable)	Jack wire color	Designation
CO 1-3	4	White/Blue	Green	CO line port 1 Tip
	3	Blue/White	Red	CO line port 1 Ring
	2	White/Orange	Black	CO line port 2 Tip
	5	Orange/White	Yellow	CO line port 2 Ring
	1	White/Green	White	CO line port 3 Tip
	6	Green/White	Blue	CO line port 3 Ring
CO 4-6	4	White/Blue	Green	CO line port 4 Tip
	3	Blue/White	Red	CO line port 4 Ring
	2	White/Orange	Black	CO line port 5 Tip
	5	Orange/White	Yellow	CO line port 5 Ring
	1	White/Green	White	CO line port 6 Tip
	6	Green/White	Blue	CO line port 6 Ring

CO line termination notes:

a. It is the installers responsibility to assure that CO line connections are made in such a way that proper CO Hunting will sequence from the first CO line button to the last, in order on key telephones.

Note:	*If incoming CO lines Hunt from a main telephone number and are also used for outgoing (both-way CO line) service, always prioritize the incoming line order so that the last choice incoming trunks appear on the higher number CO line positions. This is because the system automatically selects idle trunks for outgoing calls, by searching from CO line 12, to CO line 11, and so on to CO line 1. This technique may avoid a "head-on" or "Glare" condition where a user trying to place an outgoing call inadvertently answers a ringing line.*

b. Typically the Telco service provider provides lightning protection at the premise at the service entrance. However, if there is no lightning protection or the installation involves customer owned cable linking buildings together such that this equipment is installed at a remote site with outside plant wiring connected directly to any port of the system; the installation must include lightning protection. Install

gas discharge tubes with silicon avalanche suppressers to ground on each CO line and any port extended from the KSU over outside plant wiring. This must be done external to the system.

c. Test each CO Line at the MDF for dial tone, correct ringing sequence, Telco number assignment and polarity. *Note: The System CO Line interface circuits are polarity guarded and will properly DTMF signal on any DTMF capable CO line.*

d. Once the system is powered up, the following CO Line interface/signaling characteristics must be verified in System/Trunks Data Base Programming:
   - CO Line Group programming
   - DTMF ON Tone Duration
   - CO or PBX CO line
   - Flash Time (Call Waiting, Centrex, PBX)
   - PBX Access Codes (if PBX extension line is used)
   - Extension(s) access to outgoing and incoming lines.
   - Private Trunk Assignment
   - DISA or ECF Trunks Assignment
   - Loud Bell Control
   - Hold Abandon
   - Dial Tone Detection
   - Dial Wait Time

6.9 Station Cabling

Floor plans should be developed to aid in proper station cabling in a star (home run) configuration from the KSU. The cables are run from the station locations to the STN block at the MDF. Refer to KSU Station Cable Diagram.

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.

When the system is initialized, the intercom numbers are assigned in order from port 1 (intercom number 10) to port 24 (intercom number 33).

6.9.1 Running Cable

***NOTE**: It is recommended that three-pair cable and four-conductor (minimum) modular jacks be used for all station connections.*

From the MDF location, run unshielded, three-pair (six-conductor) twisted cable to all key telephone locations and DTMF single-line telephone locations. 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 the Loop Limit chart. The ohm values are loop measurements; feet (meter) values are the maximum one-way distances from the KSU. (See "Station Loop Resistance Test").

6.9.2 Terminating The Cables at Station Locations:

Terminate key telephones and DTMF single-line telephone cables on four-conductor modular jack assemblies at each station location.(4 conductors provide 2 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 exceptions to this, refer to the NOTE under "Running Cable" above.)

Cable Pair	Jack wire color	Designation
White/Blue	Green	Telephone voice & data XT lead.
Blue/White	Red	Telephone voice & 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.

Notes

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

6.9.3 Station Loop Resistance Test:

Perform the loop resistance test for each station cable individually.

1. No equipment can be connected to the cable pair to be tested. If a jumper wire is already in place it must be removed for this test (or unplug the Amphenol type connector from the associated 3X8 Module). Be sure that the station instrument is not connected to the modular jack assembly.
2. Place a short across the RED and GREEN wires on the modular jack assembly at the station end.

3. At the MDF, measure the resistance across the WHITE/BLUE and BLUE/WHITE wires of the cable under test. The reading should not exceed the limits (for twisted pair, unshielded 26 AWG cable) listed in the table below (ohm values are the loop measurements; feet/meter values are the maximum one-way measurements from the KSU).

TYPE OF INSTRUMENT	LOOP RESISTANCE LIMIT	26 AWG (see Specifications)
Basic Key Telephone	130 ohm	850 ft. (255m)
Analog Adapter (from KSU to SLT) Note: the 2-Port SLT adapter may be Installed anywhere inbetween.	180 ohms	650 ft. (195 m)

NOTE: Excessive and/or improperly made connections increase the resistance of a cable, which reduces the allowable cable run length.

4. Remove the short after the test is complete.
5. Repeat this test for each station cable.
6. Reconnect the station cable jump wires (or plug in the 3X8 Module connector).
7. Plug in the instruments.

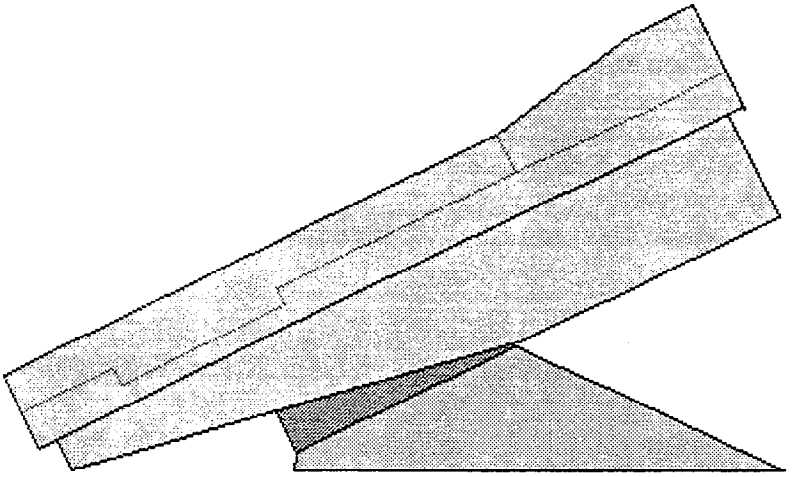
6.10 Installing Key Telephones

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:

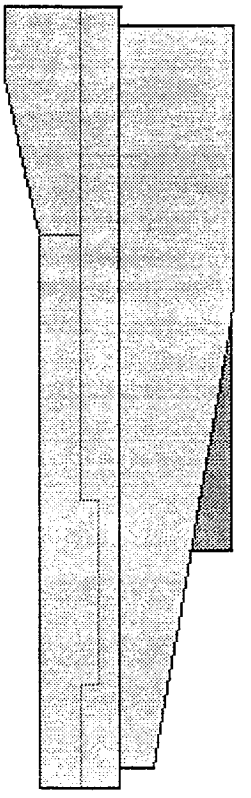
- **key telephone**
- **key telephone handset**
- **7 foot line cord**
- **4 inch line cord (for wall mounting)**
- **12 foot handset cord**
- **small base wedge mount assembly**
- **large base wedge mount assembly**

Note that 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 will be installed using both mounting wedges (small & large) for the High Profile Mounted position. Reference the illustration at left 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 to attach the small wedge to the telephone.



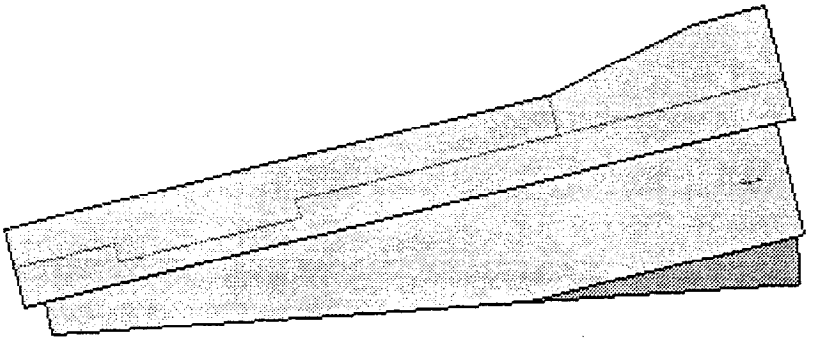
When the telephone is to be wall mounted:

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. Then 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.

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

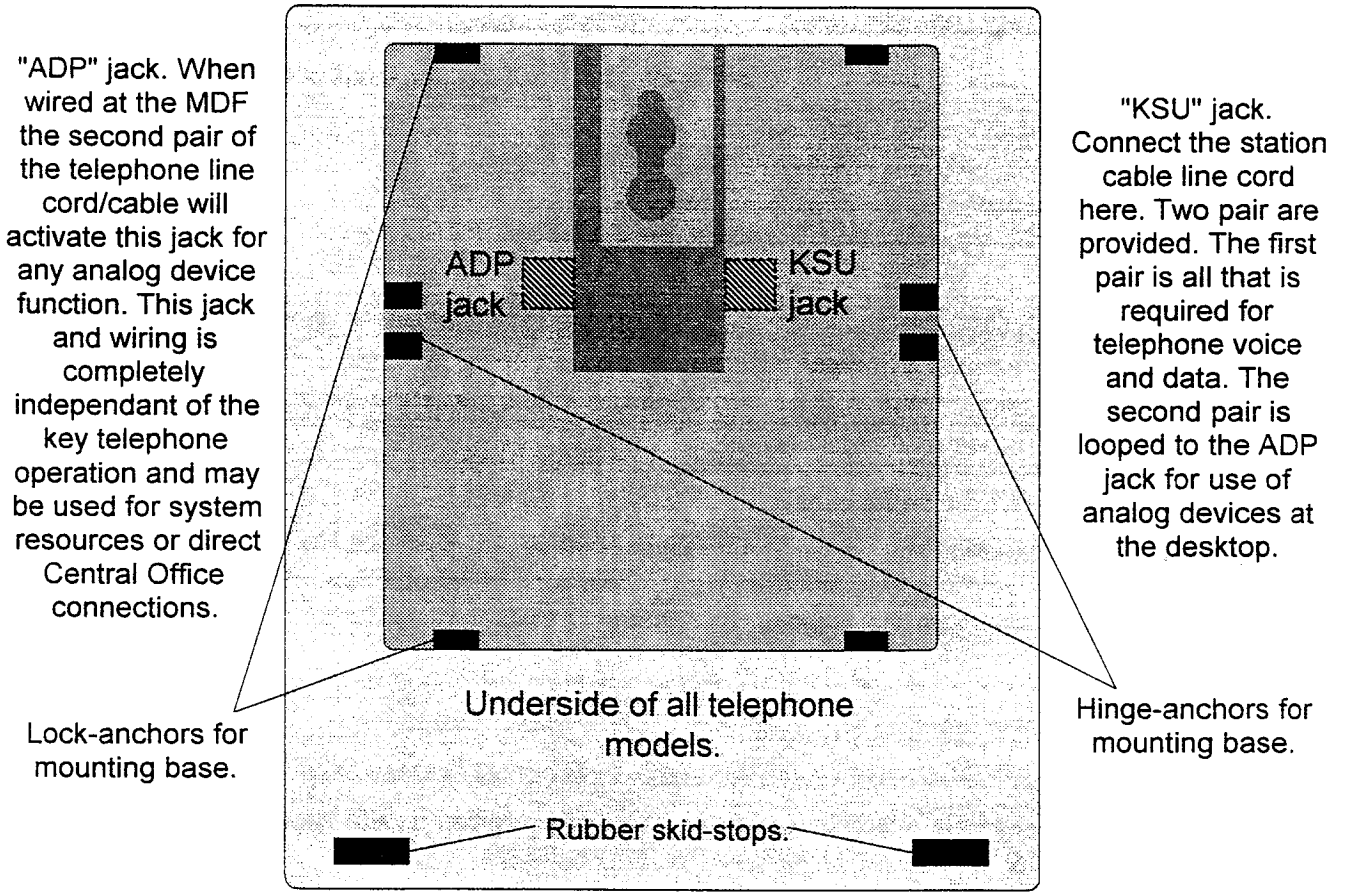
1. Remove the two small screws that secure the small and large wedges together.
2. Store the larger wedge for possible use later. (The large wedge is not used when mounting the key telephone in the Low Profile position.)
3. Position the smaller wedge as illustrated below.

   Note when using this 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.



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 left 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 right 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 the following diagram for modular jack locations:



6.11 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 RS232C cable connecting the SMDR device to the KSU must not exceed 50 feet (15 meters) in length.** The optional Option Module is required for SMDR operation.

6.11.1 To connect an output device to the KSU:

1. Match the baud rates on the output device and the system. Refer to Programming Section for the proper baud rate programming.
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.

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 toward the left of the Option Module.

The SMDR serial port output is one way to the printer or other Call Accounting device. Note: the KSU end is considered DCE and printer is DTE.

9 PIN TO 25 PIN CONNECTION CABLE

DCE	MALE DB-9	DESIGNATION	FEMALE DB-25	DTE
KSU	1	DCD	8	PRINTER
	2	TD	3	
	3	RD	2	
	4	DSR	20	
	5	GND	7	
	6	DTR	6	
	7	CTS	4	
	8	RTS	5	
	9	RI	22	

The SMDR port baud rate is programmable from 110 to 19,200 BPS. (See Database Programming.)

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 usually quite simple since a straight-through cable will typically mate the devices.

6.12 Caller ID – 1480-00 (ancillary device) connection.

When Incoming Caller ID is to be used with the Starplus DHS system it is necessary to use the Vodavi 1480-00 Caller ID data collection module. The 1480-00 must be connected to the Starplus DHS system PC Programming port. The 1480-00 collects data at each CO line to be used for Incoming Caller ID and passes the data to the DHS system for processing.

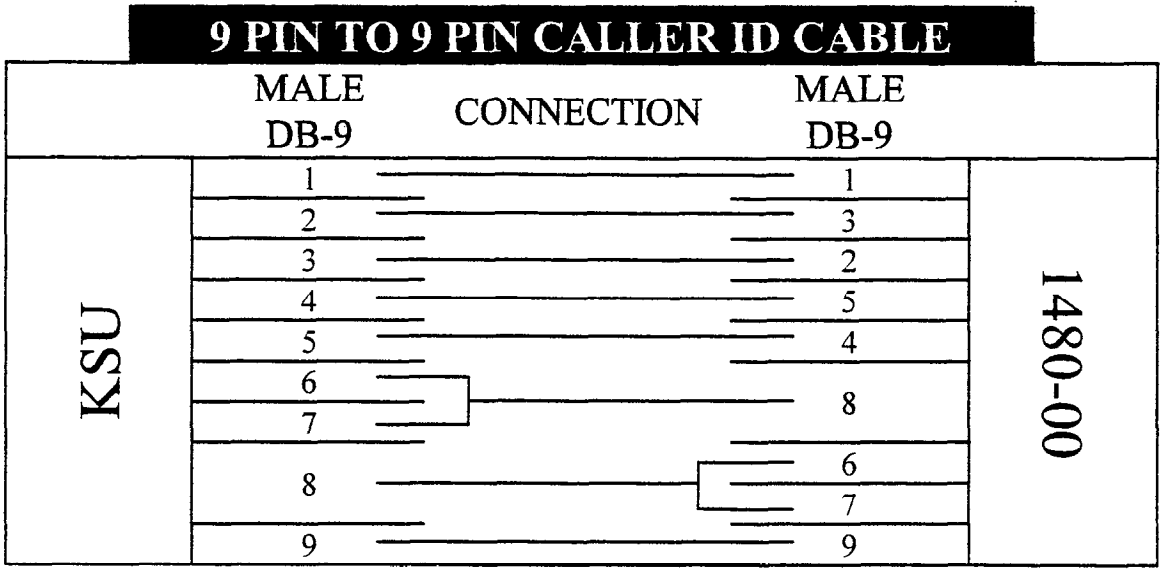
Each DHS CO line port must be programmed for the associated 1480-00 port in customer database programming. The CO Line programming parameter "ICLID PORT#" has been added to the DHS database programming to facilitate this need. An example of this programming is... assume a CO line is connected to the DHS CO line position 1 and to the 1480-00 line position 1. The installer must program DHS CO line 1 for ICLID port # "01". The programming of this data parameter is also used to alter DHS software that this port is an ICLID port. When ringing occurs on a CO line associated to a "ICLID PORT #", ringing is delayed at ringing assigned stations until ICLID data had been received. (Refer to CALL HANDLING – WAIT ICLID). At default the data in the "ICLID PORT#" programming parameter is "0", this indicates that no ICLID data is expected to be received after the first ring.

The 1480-00 module is connected to the DHS system via the "ICLID/PC Programming" port on the Option Module. Consequently, the PC Programming port cannot then be used for PC-based remote programming and Incoming Caller ID data collection simultaneously.

When all hardwire connections are complete adjust the 1480-00 option switches for 2400BPS operation. Then program the DHS system PC Programming port for 2400BPS operation (RESOURCE - RMT

X_RATE). This port must also be set to automatically accept Incoming Caller ID data; set the Data Link programming parameter to "AUTO" to complete this programming requirement. (RESOURCE - DATA LINK).

The cable from the 1480-00 to the DHS Remote Programming port should be configured as follows:

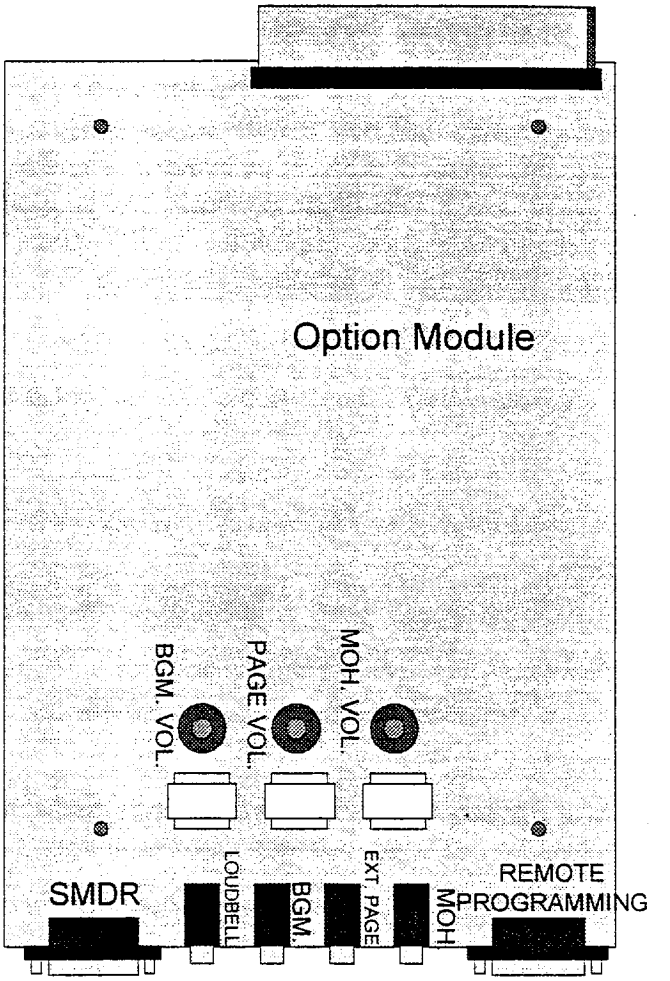


6.13 External Paging Equipment (optional)

The system provides a **one way** paging output at the KSU from the Option Module when installed. An 1/8-inch phono jack labeled "J3 EXT PAGE" is provided for connection of an external paging amplifier. The input specifications for the external paging equipment should accept a 600 ohm and 0 dBm interface.

6.13.1 Install the external paging equipment as follows:

1. Cut a length of shielded cable to run from the amplifier to the KSU.
2. Attach an eighth inch male phono plug to one end of the cable.
3. Connect the other end of the cable to the amplifier high-impedance input according to the manufacturer's instructions.
4. Connect the paging speaker(s) to the amplifier using speaker cable.
5. Plug in the amplifier's AC power cord. DO NOT use the same AC outlet being used for the KSU.
6. Insert the eighth-inch phono plug into the jack labeled "EXT. PAGE" located on the bottom edge of the installed Option Module. (The "Ext. Page" phono jack on the Option Module is the center right phono plug. See diagram.)
7. Set the paging amplifier's volume control to the lowest setting and turn ON the external amplifier.
8. From a station location, make a page by lifting the handset, and **dialing F501** (the external page feature code).

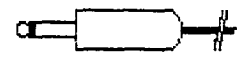


9. Adjust the amplifier to the desired level while announcing the page.
10. "PAGE VOL" may be adjusted to attenuate the output signal in the event the signal is to strong for the connected amplifier input (over-driving input).

Notes on multi-zone and talk-back external paging:

a. If the one way paging equipment requires DTMF signaling from the key telephone, then an unused CO Line should be dedicated for proper page interface.
b. For talk-back paging or multi-zone external paging, the manufacturer recommends using a vacant CO line port for best operation.
c. A 600 ohm interface is provided on every CO line therefore any available CO line may be used for paging.
d. Since all CO line dialing is subject to toll restriction, a CO line port will not connect the station's audio until at least one DTMF digit is dialed.
e. It may be necessary to assign the CO line being used for paging as a PBX type trunk with one or two digit access. Therefore, normally toll restricted extensions may still make external pages, without being restricted.

6.14 External Music Source - Standard MOH/BGM Module

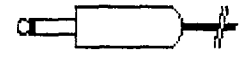


The Basic KSU is shipped with the Standard MOH/BGM Module. This module is located on a stand-off post toward the upper right corner of the CPU Module when viewing the installed KSU. The module provides a 1/8-inch phono jack labeled "JK1 MOH JACK" for direct connection to an external radio tuner, CD/tape player or other music source. The system music input impedance is 20K ohms. A trim POT (potentiometer) is also provided on the Standard MOH Module for signal attenuation. To adjust the music level:

- Set the trim POT (labeled "VR1 MOH VOL") at about mid-point.
- Access an idle CO line and dial into the system on another CO line.
- When the system begins to ring, press HOLD to place the first call on hold.
- Answer the ringing CO line. You should hear the Music On Hold from the previous (now holding) CO line.
- 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 the music begins to sound distorted do not increase the source level any further. Rather, adjust the source level down slightly and use the trim POT (labeled "VR1 MOH VOL") for further adjustment.
- 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.

  NOTE: *In some circumstances, there may be broadcast restrictions associated with the music. Check with the music's original distributor and/or the radio station for copyright and broadcast restrictions concerning background music and music-on-hold.*

6.15 External Music Source - Option Module



The Option Module may be installed for several feature upgrades. One of these upgrades is the addition of a second music source. When installed the Option Module provides an MOH 1/8-inch phono jack labeled "J2 MOH" (located at the bottom edge of the Option Module toward the right) that replaces the music circuit of the Standard MOH/BGM Module and an 1/8-inch phono jack labeled "J4 BGM" that adds a second BGM channel. (J4 is located at the bottom edge of the Option Module toward the center left.)

To install the external music source:

If using a radio as the music source, place it 5 to 10 feet away from the KSU to avoid RFI generated by the KSU.

1. Attach an 1/8-inch, two-conductor, phono plug to one end of a length (5 feet minimum) of shielded cable.
2. **EITHER**: connect the other end of the cable to the speaker output terminals of the music source.

OR: if the music source has an earphone jack, attach another 1/8-inch phono plug (or other specified connector) to the other end of the cable, and plug it into the earphone jack on the music source.

3. Plug in the AC power cord for the music source. If possible, use a separate AC outlet than the one being used for the KSU. Turn on the AC power to the music source.
4. Insert the 1/8-inch phono plug into the appropriate music source jack inside of the KSU.
5. Since the "MOH" music source serves to provide both Music On Hold and Background Music it is best to adjust the input level such that Music On Hold is at a comfortable level. To set a desirable MOH level:
    - Set the trim POT (labeled "VR1 MOH VOL") at about mid-point.
    - Access an idle CO line and dial into the system on another CO line.
    - When the system begins to ring, press HOLD to place the first call on hold.
    - Answer the ringing CO line. You should hear the Music On Hold from the previous (now holding) CO line.
    - 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 the music begins to sound distorted do not increase the source level any further. Rather, adjust the source level down slightly and use the trim POT (labeled "VR1 MOH VOL") for further adjustment.
    - 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.
    - ***NOTE:*** *In some circumstances, there may be broadcast restrictions associated with the music. Check with the music's original distributor and/or the radio station for copyright and broadcast restrictions concerning background music and music-on-hold.*
6. The BGM music level can be attenuated using the trim POT "VR3 BGM VOL".

6.16 Headset Installation

The system supports integrated headset operation. Customers may take advantage of this standard system feature at any key telephone. Most headsets will operate without extra equipment or need for additional steps in user operation.

Installation

A headset adapter that uses a rocker type switch to select between Headset and Handset use is desirable. The headset adapter is plugged directly into the Handset jack. The telephone handset is then plugged into the headset adapter.

Non-amplified headsets receive operating voltage from the headset circuitry built into the phone. See the headset manufacturer's instructions for information regarding compatibility, power source (power adapter or batteries), and special options.

Note: On amplified headsets with self-powered (battery) headset adapters, the key telephone MUTE operation may not mute the headset. This is because the key telephone MUTE function removes system battery from the microphone at the handset jack. External power supplied to the headset will maintain its

microphone voltage and allow the user to override the key telephone MUTE operation. In this case the headset adapter Mute function must be used. (See headset manufacturer's instructions for more details.)

6.17 Battery Back-up

In the event of commercial AC power outage, the system can maintain full operation if battery backup is used. When Battery back is required, the Starplus Battery Back up Unit is used. Follow the instructions supplied with the BBU to install batteries in that unit. Refer the chart below for system operating current draw to select the right battery size for the desired back up duration.

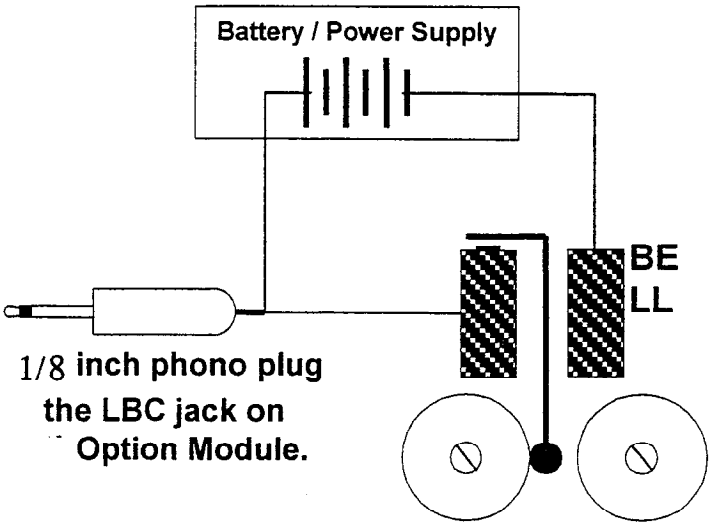
BATTERY SIZING CHART			
System Size (maximum draw for size considered)	Discharge Rate	Up Time (Hours)	Required Battery Amp-Hour rating
1 - 3X8 Module installed	0.75 AmpDC	1	1.5AH
		4	4AH
		8	7.5AH
		24	30AH
2 - 3X8 Modules installed	1.6 AmpDC	1	3AH
		4	8AH
		8	16AH
		24	40AH
3 - 3X8 Modules installed	2.5 AmpDC	1	5AH
		4	15AH
		8	25AH
		12	40AH
1 - 3X8 Module and 1 - 6 Port CO Module installed	0.8 AmpDC	1	1.5AH
		4	4AH
		8	7.5AH
		24	30AH
2 - 3X8 Modules and 1 - 6 Port CO Module installed	1.7 AmpDC	1	3AH
		4	8AH
		8	16AH
		24	40AH

6.18 Loud Bell Control (optional)

When the Option Module is installed the system provides a dry contact closure 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.

Installation

1. Determine which CO lines should operate the Loud Bell Control (LBC) relay. Program each of these lines separately for **LOUD BELL = Y**. See CO LINE PROGRAMMING
2. Cut a length of cable to run from the MDF to the Option Module.
3. Attach a male 1/8 inch phono plug to one end of the cable.
4. Then insert the 1/8 inch phono plug into the "LOUDBELL" jack (left-most 1/8 inch jack along the bottom edge of the Option Module).



5. Terminate the other end of the cable on an industry standard 66M1-50 block for interconnection to the loud bell and power source.
6. Terminate the Loud Bell and power supply leads on an industry standard 66M1-50 block.
7. Using cross-connect (jumper) wire connect each of the three LBC components (contact, bell and power source) in series fashion.

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

No voltage is supplied by these contacts. **CAUTION: Do not connect 110 VAC power to these terminals.** Standard ringers operate from 90VAC/20Hz signal voltage from the CO. An external ringing generator will be required if using standard ringer(s) as the Loud Bell.

Alternatively, low voltage Loud Bell devices may be used. When using low voltage bells/signals a suitable power supply is required.

CAUTION: Do not exceed 0.5 Amperes on the LBC.

6.19 2 Port SLT Adapter

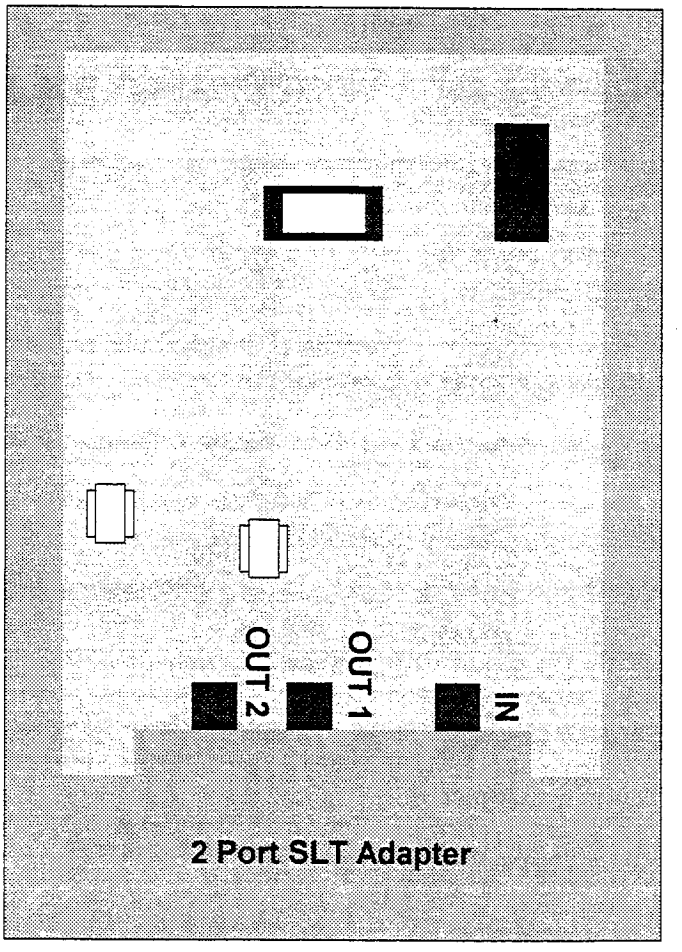
The 2-Port SLT Adapter is used to connect analog single line telephones (SLT) and other analog devices to the system. The analog device must provide DTMF (touch tone) signals in order to make intercom calls, access outside lines and to activate system features. Some examples of analog devices are; telephone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

Note: *The* 2-Port SLT Adapter *is not an OPX device as determined by FCC Rules.*

The 2-Port SLT 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). **Note: do not exceed the maximum cable length from KSU to SLT regardless of where the 2-Port SLT Adapter is installed.**

To install the 2-Port SLT Adapter:

1. The 2-Port SLT 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 SLT Adapter 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 SLT 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.
6. The modular jack "OUT2" is also now operational as an analog device port with a station number assigned from the upper range (B2 voice channel). The number assigned is from 58 to 81. Determining the number is done by association; if the B1 voice channel station number connected to the 2-Port SLT Adapter is 11 then the B2 voice channel station number is 59. Use this relationship in numbering to determine the B2 channel station number. Or simply dial an Executive Key Telephone from the B2 station port and read the display.

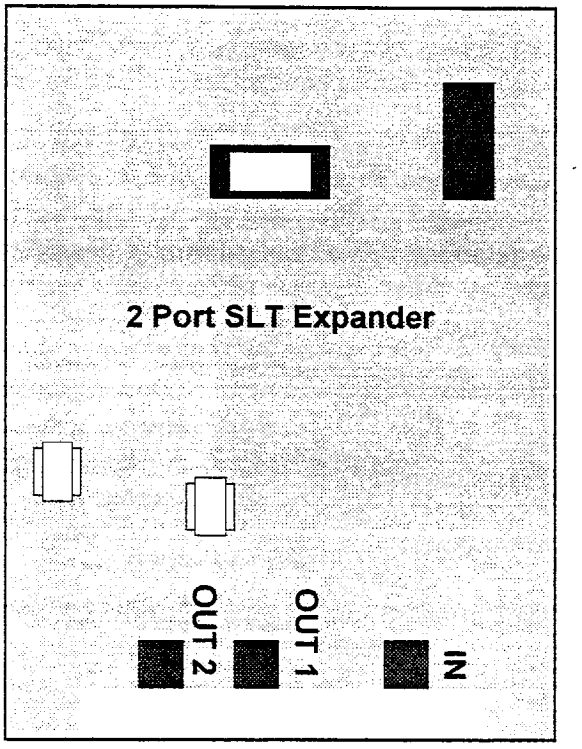


6.20 2-Port SLT Expansion:

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

To install the 2-Port SLT Expansion into the 2-Port SLT Adapter enclosure:

1. Position the 2-Port SLT Expansion over the stand-off posts that are factory installed on the 2-Port SLT Adapter PCB.
2. Using the screws supplied with the 2-Port SLT Expansion, secure the 2-Port SLT Expansion PCB to the stand-off posts.



Note: Only one 2-Port SLT Expansion can be installed in a 2-Port SLT Adapter housing.

Wire polarity

The Analog Adapter is not polarity sensitive, in its association to the incoming 2B+D feed cable ("IN" jack). However, certain older DTMF type equipment connected to the A/A may not have polarity guard. If the attached SLT device cannot DTMF signal (can't break Intercom Dial Tone), then the TIP/RING pair coming from "OUT1" or "OUT2" will need to be reversed.

The Analog Adapter is a self-contained, self-powered, digital-to-analog converter with built-in circuits:

- CODECS
- 2 DTMF Receivers (one dedicated to each port)
- Digital Port Interface (2B+D)
- 20/25Hz, 50v minimum square wave Ringing Generator
- 2 Analog Ports, -30vdc

The Analog Adapter generates common ringing voltage signal for the two (2) independent analog ports. External, transferred and internal calls will signal in accordance with the System Programmed "Ring Scheme".

The A/A interprets hook-switch (flash) depressions and DTMF (not rotary/pulse) signals from the attached SLT for feature requests, intercom calling or outside line access. The DTMF signals and hook-switch operation are translated and communicated to the system CPU for call processing, toll restriction and other services. Incoming calls are connected automatically when the A/A "senses" an off-hook condition, regardless of whether the attached device is an SLT, FAX, modem or TAD.

The System Database allows the installer to adapt to varying kinds of analog equipment, in a PBX like environment. The system can be programmed to ignore hook-switch "bounce" or false transfer requests. (See SLT Hook-flash under the Call Handling programming category). By setting the **minimum** open loop (flash) detection time in software, false transfers that sometime occur during on-hook transfers are eliminated. Default programmed minimum hook-flash detection time is 100 msec. The minimum hook-flash detection is selectable from 60-1400 msec (.06 - 1.4 seconds).

Similarly the system can establish a **maximum** open loop (flash) detection time for differentiating between a valid transfer request and a request to disconnect an established call. Default setting is 400 msec. The maximum open loop detection time can be selected from 100 to 1,500 msec.(.1 seconds to 1.5 seconds).

NOTE: *In no case will the system allow the programming of the minimum detection time to exceed the maximum time. Generally, most SLT equipment can be accommodated by setting the minimum detection to 300 msec. and the maximum detection to 800 msec.*

CAUTION: The above "flash" detection scheme is only for supervising the SLT user operation within the key system. If the system is used behind a PBX, or if custom Centrex features are provided over the incoming CO lines, then the system FLASH programming is separately programmed. The system FLASH established a fixed period of time that the system will generate an open loop (flash) condition to the serving CO or PBX, for the affected CO line. An SLT user is not allowed to directly flash the outside line terminated at the KSU.

Special Note:	When an answering machine is connected to the system via the 2 Port SLT Adapter/Expansion and In-Band (DTMF/Touch Tone) signaling is required at the answering machine to operate answering machine features, the installer must program the associated SLT port as type "VM".

6.21 Power Up Initialization

After installing the system, the system must be initialized so that DEFAULT DATA is loaded.

1. Locate the database INITIALIZATION switch "SW1" on the CPU Module. It is located at the bottom edge of the CPU Module oriented in the center. It is also labeled "ON" and "OFF".
2. This switch controls connection of the dynamic RAM battery circuit. When switched OFF, customer volatile database programming is not protected by the memory battery in the event power is lost. In normal operation this switch will be ON at all times.
3. To load default at this time turn KSU power OFF.
4. Operate the INITIALIZATION (SW1) to the "OFF" (left) position.
5. Allow the system and switch to remain in this state for approximately 2 minutes.
6. Operate the INITIALIZATION (SW1) to the "ON" (right) position.
7. Restore system power.
8. Observe the CPU/Power LED. After approximately 4-6 seconds the LED should begin to flash.
9. If the LED remains unlit or lit without flashing, repeat the above steps from step 3. Further problems require manufacturer assistance.
10. Once the power up sequence is complete DEFAULT DATA is loaded and the system should be fully operational.

6.22 Starplus DHS Feature Package Upgrade Procedure

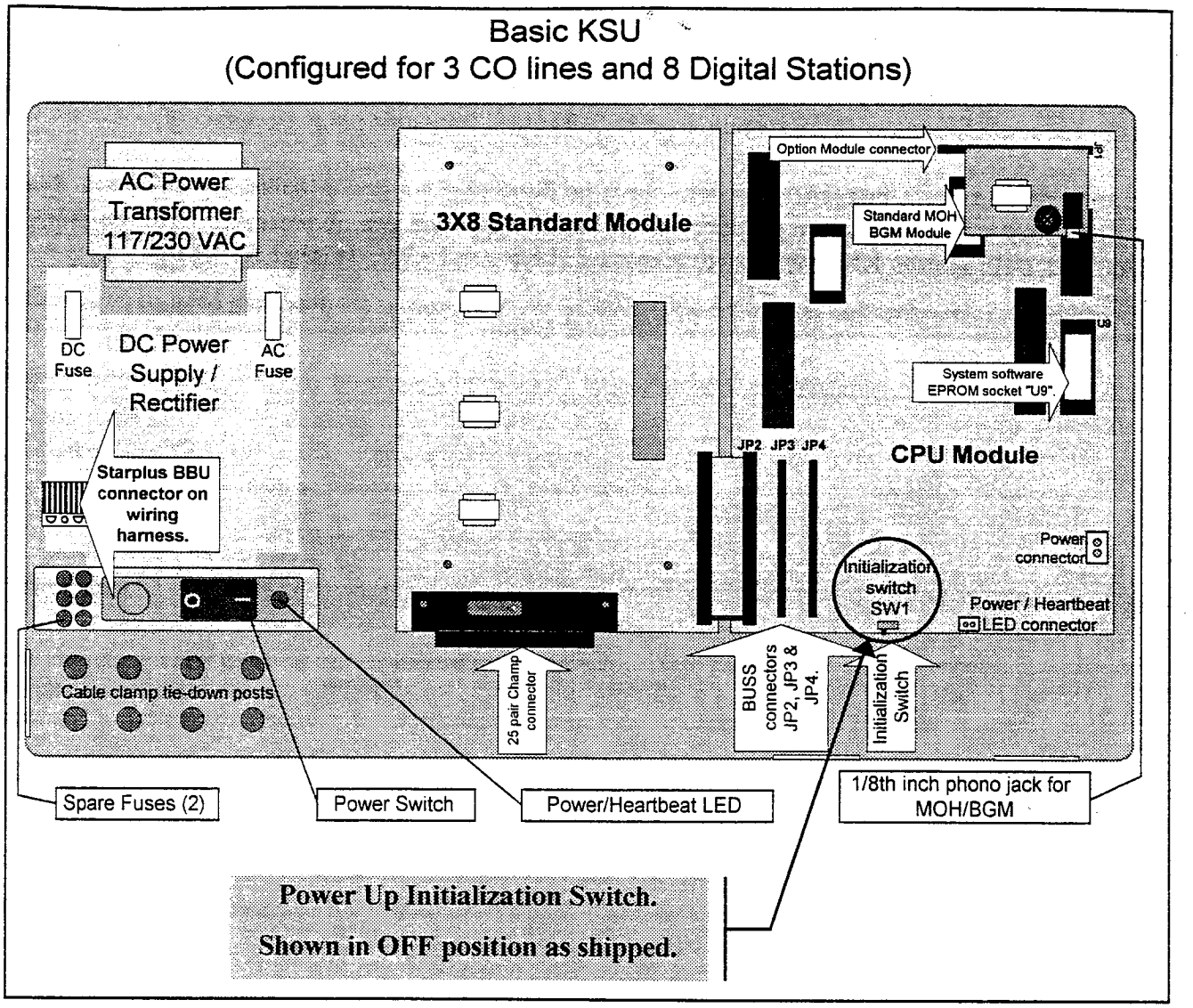
Use the following procedure to upgrade the Starplus DHS system Feature Package software. Once the upgrade is complete the DHS system must be initialized to assure proper operation.

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 Starplus DHS system KSU with cover removed. (USE A STATIC WRIST STRAP!)

1. Disconnect system power and remove the KSU cover by removing each of the four front cover screws located at each corner.
2. If an Option Module is installed it must be temporarily removed to gain access to the system software EPROM socket ("U9").
3. Use the diagram below and locate the system software EPROM socket "U9". Observe the orientation of the notch at one end of the EPROM so that the new EPROM is installed with the same orientation.
4. Using an IC extractor tool remove the DHS software EPROM from the "U9" socket
5. Carefully remove the new software EPROM from its packing material and inspect for damage. (If any damage is noticeable please contact Vodavi Customer Services.)
6. Install the new EPROM into the vacated "U9" 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.)
7. Replace the Option Module if removed in step 2.

Proceed with Power Up Initialization...

8. Locate the database INITIALIZATION Switch "SW1" on the CPU Module. It is located at the bottom edge of the CPU Module oriented in the center. It is also labeled "OFF" and "ON".
9. Operate the INITIALIZATION Switch (SW1) to the "OFF" (left) position
10. Allow the system and switch to remain in this state for approximately 2 minutes.
11. Operate the INITIALIZATION Switch (SW1) to the "ON" (right) position.
12. Restore system power.
13. Observe the CPU/Power LED (adjacent to the power switch). After approximately 4-10 seconds the LED should begin to flash.
14. If the LED remains unlit or lit without flashing. turn system power OFF and repeat the above steps from step 9 allowing more time at step 10. Further problems require manufacturer assistance.
15. Once the power up sequence is complete DEFAULT DATA is loaded and the system should be fully operational.



Notes:

a. SW1 must remain in the "ON" position following initialization to engage customer database RAM memory backup in the event of commercial/utility power outage.

b. RAM backup battery charging occurs only when SW1 is in the "ON" position. The RAM battery requires 14 hours minimum normal (powered) system operation for adequate charging.

c. 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.

7. DATABASE PROGRAMMING

Important! It is **VERY** important to load default customer data when a system is first installed, when upgrading software feature packages or when severe power disturbances cause reason to doubt the customer database integrity! If any of these conditions exist please use the **Power Up Initialization** procedure at the end of the Installation section before proceeding with any customer specific programming.

Database protection:	Customer Database programming is protected from loss during power interruptions by an internal Nicad battery. This battery will maintain customer database programming for up to 300 hours when fully charged. For a battery to become fully charged the system must be powered continuously for 14 hours.

7.1 Remote Programming

Feature Package 2 (software version "V2.xxx" and greater) allows the service technician to program the DHS system using an external, PC-based, Windows™ software programming tool. The Windows™ software tool streamlines programming and allows for easy database printout and reserve storage. Operation of the Windows™ software is not covered in this text. On-line help is provided within the software tool to assist the adept user. Those unfamiliar with PC operation and the Windows™ environment should rely on the following (all encompassing) built-in Database Administration facility.

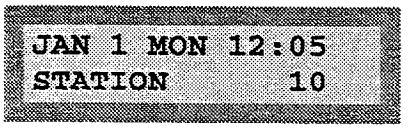
7.2 Enter Database Programming

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.)

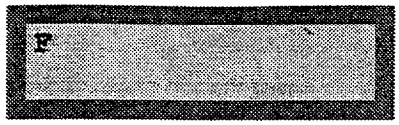
Depending on initial setup, the system may operate only as a Key system and utilize the Key system (KF) FCC Registration Number, or as a hybrid PBX system which requires a different unique FCC (MF) Registration Number.

The selection of KEY or PBX operation is made by the installing company and requires proper notification to the telco regarding the type of service to be provided by the local exchange carrier.

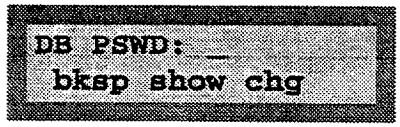
The display of the idle key telephone should look something like this:

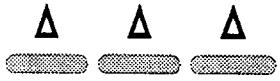


Press the FEAT button. The display changes as seen below:

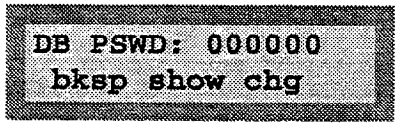


Dial # * on the keypad. The display prompts for the database password:



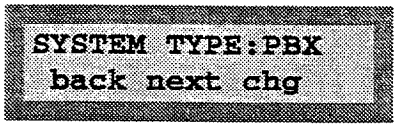


At default the password is "**000000**". Enter the six-digit DEFAULT Password - 000000.

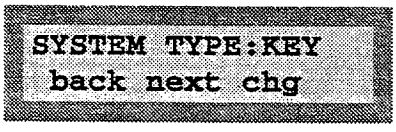


Press the center Soft button ( ) corresponding to the "**show**" seen on the display. The display shows the first customer database-programming category "System Type". There are two choices in this category, "PBX" or "KEY".

Notice:	The FCC Registration number that is provided to the telephone operating company servicing this equipment is directly related to the programming of this category. Please see the "System Type" section for details.



Press the right Soft Button ( ) ("**chg.**") and watch as the value stored for the System Type is changed from one of the available choices to the other with each depression.

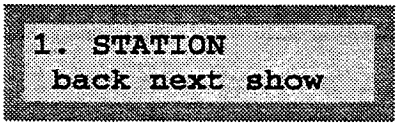


At the moment the "**chg**" button is pressed and the value displayed, that operation becomes functional. (This is true for any database field where the "**chg**" button selects from the available data field values. In other areas of programming where data is entered from the dial key pad, the "**save**" Soft Button must be pressed to save that entered data. At the time the "**save**" Soft Button is pressed, that data becomes functional.)

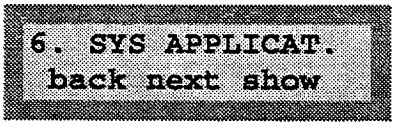
Notes:

1. If customer changes system type from PBX to KEY system, the contents in programmable feature keys where CO line group number had been programmed before will not be affected or changed. Consequently, depression of those feature keys associated with KEY type mode will not operate.
2. When checking those feature keys via key inquiry function, depression of soft key SHOW during verification will generate warning message of "CODE UNAVAILABLE".

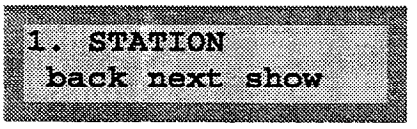
When the center Soft Button "**next**" is pressed the next sequential programming category is displayed.

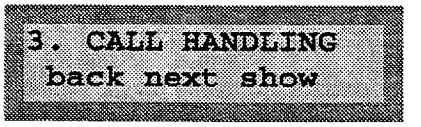


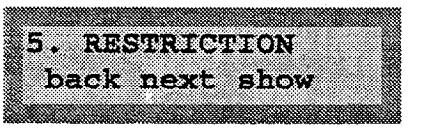
Or if the left Soft Button "**back**" is pressed the last programming category is displayed.

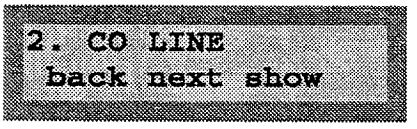


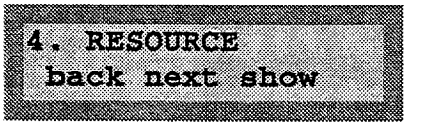
The two Soft Buttons (left and center) "**back**" and "**next**" can be pressed repeatedly to move through the programming categories in a menu fashion. The programming categories and associated displays are as follows:

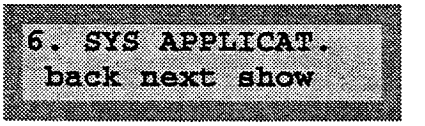












Notice that the category "System Type" appears only following Database Programming entry and the DB Programming password. Pressing "**back**" and "**next**" will not re-display this category.

Note : Only one Executive key telephone can be used to do system programming simultaneously. Otherwise a warning message will be received.

7.3 LCD Soft Button definitions for database programming:

The three LCD interactive Soft Buttons are instrumental in the programming process. Programming must be performed at an Executive model key telephone since the Soft Buttons associated to the interactive LCD display constitute the means of all data entry. LCD display menu prompts seen during programming are as follows:

Δ
back and **next** generally allow movement through Database Programming menus.

Δ
show (Display) Press the **show** button to display the next menu level or programmed data.

Δ

chg. (Change)

Press the **chg** button to modify the content of the current programming item.
Generally, **chg** will cause the current data item to update from the allowed values for that data item. In this case the new data is functional at the time it is displayed.
In other cases where the system does not generate specific values for the current item (such as password entry), the data item field allows entry from the dial pad and the Soft Buttons **save** and **bksp** are made available to edit the data item content.

Δ

bksp (Backspace)

Press **bksp** while editing a data item field to erase any input one character at a time. When the desired value is displayed, press **save** to store the data and start system use of that data. Note that the **chg** button may be pressed any time while editing or after the **save** is pressed to re-enter new data.

Δ

save (Store)

For data items requiring input from the dial pad (such as password entry) press **save** to store the data and start system use of that data.
While data is entered, the system will check the entered data automatically. If the data entry is invalid, the programming prompt will be refreshed. If the data is valid, the station user must press the **save** button to confirm, then the system will allow the programmer to proceed to the next item or category.

HOLD

exit/abort (**HOLD** button)

The **HOLD** button is not a LCD prompted operation. However the **HOLD** button may be pressed to exit any programming menu level to the previous menu level or to **abort** data entry in any field requiring dial pad key input. When **HOLD** is used to abort any key pad entry item the previous data is restored.

7.4 Database Programming Table

The table below is a list of the programming parameters for the Starplus DHS. When Database Administration is entered the programmer is presented menu prompts for all these programming parameters. The programmer may move forward and backward through the menu structure listed below (via "back" and "next" LCD Soft Buttons) to complete all specific customer database entry requirements. Enter database programming: FEAT + # + ⇑ + password + Δ (show)

SYSTEM TYPE				Range	Default	Page
back Δ	next Δ	chg Δ				
to 6. System Application				PBX/KEY	KEY	163

1. STATION				Range	Default	Page
back Δ	next Δ	show Δ	Day Class	0-7	0	163
			Nite Class	0-7	0	164
			CO Line Assignment	1-12, Y/N	all Y	164
			Receive Assignment	1-12, Y/N	all Y	164
			(*) Ring Assignment	DAY/NITE/BOTH/NONE	Sta 10 DAY	164
			Acc Code Forced	Y/N	N	164
			Station Group	1-8	1	165
			Warning Tone	Y/N	N	165
			Drop Timeout	Y/N	N	165
			Sta Position	Xx	10-81	165
			VM Port	Y/N	N	166

2. CO LINE				Range	Default	Page
back Δ	next Δ	show Δ	Dialing	Tone/Pulse	Tone	166
			Call Abandon	Y/N	Y	166
			CO Line Type	CO/PBX/OPN	CO	166
			Loud Bell	Y/N	N	167
			CO Line Group	1-4	1	167
			Private To	xx	EMPTY	167
			Toll Override	Y/N	N	167
			Distinct Tone	0-4	0 (none)	167
			(*) ICLID Port	0-12	0 (none)	168

3. CALL HANDLING				Range	Default	Page
back Δ	next Δ	show Δ	Privacy RLS (release)	Y/N	N	168
			Priv RLS Tone	Y/N	Y	169
			Ex_Hold Time	0-8 min	4	169
			Flash Time	0.1-1.5 sec	0.7	169
			Remind Time	0/10/30/60/90 sec	30	169
			Park Remind	30/60/...180 sec	30	170
			Pause Time	1.5/2/3.5/5 sec	2	170
			PBX Code	0-9	9	170
			PBX Auto Pause	1-9	1	170
			Dialing Ratio	see detail	-	170
			VM Dialing Ratio	see detail	-	171
			Warning Time	1-8	3	171
			Recall Time	16/30/60/90/120 sec	30	171
			(*) SLT Hook_Flash	see detail	-	171
			†DISA	see detail	-	172
			†External Forward	see detail	-	173
			†Uns Conf Time	1-15	1	173
			Operator Code	0/9	0	173
			†Uns Conference	Y/N	Y	174
			†Auto Busy Redial	see detail	-	175
			Call Abandon Time	see detail	-	175
			Ring Alt Position	30/60/...180 sec	30	175
			CO LN Preset FWD	6/10/16/22/30/40 s	16	175
			(*) Wait_ICLID	3.5/4.0/...7.0 sec	4.0	175
			(*) VM MON Time	10/20/30/40/60 sec	30	176

(*) New or updated feature with FP2.
† Requires Option Module for operation.

4. RESOURCE				Range	Default	Page
back Δ	next Δ	show Δ	Ring Scheme	1/2/3/4	2	176
			Letter Type	0/1/2/3/4/5	0	177
			Attendant	10-33	10	177
			Alternate [Attendant]	10-33	EMPTY	177
			System Alarm	00:00-23:59	EMPTY	177
			Nite Start	00:00-23:59	EMPTY	178
			Nite End	00:00-23:59	EMPTY	178
			DB Password	xxxxxxxx (x=0-9)	00000000	178
			User Password	xxxx (x=0-9)	0000	178
			User Name	7 alphanumeric	EMPTY	178
			Preprog Message	7 alphanumeric	see detail	179
			System Speed No	BINs 20-99	EMPTY	179
			BGM	Y/N	N	180
			CO Line Copy	-	-	180
			Station Copy	-	-	180
			Feature Button Copy	-	-	180
			System Time	00:00-23:59	see detail	181
			Ac_Code Table	see detail	see detail	181
			Data Link	Manual/Auto	Manual	181
			RMT X_Rate	110/300/...19200	9600	181
			SMDRX_Rate	110/300/...19200	9600	181
			Hour Mode	12/24	12	182
			†Dial Tone Detect	Y/N	N	182
			Dial Wait Time	0-8	0	182
			KSU Revision	-	-	182

5. RESTRICTION				Range	Default	Page
back Δ	next Δ	show Δ	CO LN Call Discrim	see detail	see detail	183

6. SYSTEM APPLICATION				Range	Default	Page
back Δ	next Δ	show Δ	Sta Hunt Group	see detail	see detail	183
	To 1.Station		Voice Mail	see detail	see detail	184

† Requires Option Module for operation.

7.5 Programming Parameter Details

7.5.1 System Type

Description:

The system may be programmed for compliance to the appropriate CO line access functionality corresponding to the FCC registration number provided to the servicing telephone company. When the "MF" registration number is used, CO lines may be accessed by any system means (direct CO line button access or Pooled CO line access). This type of operation is referred to as "PBX" operation.

When the "KF" registration number is used, CO lines may only be accessed by a direct button assignment. That is, no Pooled CO line access function will operate when this mode is selected. Single Line Telephones must use specific CO line access codes when dialing out.

Note: local tariffs vary from one vendor to another, specific rules concerning CO line access should be derived from the serving telephone company. Check with your telephone company provider for more details.

Range : PBX/KEY
Default : KEY

7.5.2 Station

Description:

When the "SHOW STATION" prompt is displayed the programmer should enter the two-digit station number to be programmed. Once entered the center Soft Button "**show**" is pressed to enter into station programming parameters for that station number.

Range : 10-81
Default :N/A

7.5.2.1 Day Class

Description:

Each station may be assigned one COS (Class Of Service) for the Day system mode of operation. This COS is directly referenced in the Restriction, CO Line Call Discrimination, Digit Interval Table programming. The Digit Interval Table allows the programmer to be selective of which stations will be given the ability to dial specific digit intervals by assigning table entries to those COS's desired. (For example a station with COS 1 may be allowed to dial a digit interval of "1800" and a station with COS 2 may be allowed to dial only those numbers beginning with a digit from 2-9.

COS also dictates which stations will be given the privilege of Overriding DND and joining an existing CO line conversation via the Privacy Release feature.

COS "0" in these cases is considered the highest level where COS "7" is the lowest.

Considering this, a station with a higher COS will be given the option of overriding DND at a station with a lower COS.

Privacy Release allows a station to join a CO line conversation in progress when the joining station's COS is equal or higher than the COS of the station engaged in the current conversation.

COS also dictates the station's ability to use System Speed Dial. COS levels 0-5 allow full use of System Speed Dial bins 20-99. COS level 6 allows the use of System Speed Dial bins 20-39 only and COS level 7 restricts System Speed Dial access completely.

Range :0-7
Default : 0

7.5.2.2 Nite COS

Description:

Reference the description above for qualities of COS programming. Nite COS specifically allows the programmer to assign a different mode of operation to any station for system Night Mode operation.

Range : 0-7
Default : 0

7.5.2.3 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 12 CO lines.

Range : 1-12 "Y/N"
Default : 1-12 "Y"

7.5.2.4 Receive Assignment

Description:

Receive Assignment allows complete flexibility of CO line incoming signaling. Each station in the system may be programmed to follow CO line ringing condition of any of the 12 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.

Range : 1-12 "Y/N"
Default : 1-12 "Y"

7.5.2.5 Ring Assignment

Description:

Ring Assignment allows complete flexibility of CO line incoming ring signaling. Each station in the system may be programmed to ring on any of the 12 CO lines. Programming for each CO line may be configured to ring at any station for the associated mode of system operation (Day, Night, Both Day & Night or None (no ringing). (Note: Receive Assignment must also be set to "Y" for a station to answer a ringing CO line.)

Range : CO lines 1-12 "DAY/NITE/BOTH/NONE"
Default : CO lines 1-12 "DAY" for station 10 only, all others are "NONE"

7.5.2.6 Account Code Forced

Description:

Any station in the system may be forced to use an account code when outgoing calls are made. When this parameter is set to "Y" there must also be valid account codes programmed into the Account Code Table. The account code entered at a station that is Account Code - Forced will

be verified against the table for a match. If a match is found the outgoing call attempt is allowed, if not the call attempt is denied.

Range : "Y/N"
Default : "N"

7.5.2.7 Nite Service

Description:

Any station in the system may be assigned as a Nite Service station. A Nite Service station will ring for calls coming into the system CO lines while the system is in Night mode. Note: Other ringing programming is unaffected by this programming. Stations assigned to ring on CO lines in Station Ring Assignment programming continue to ring in the Nite Service mode.

Range : "Y/N"
Default : "N"

7.5.2.8 Station Group

Description:

Stations may be assigned to one of eight available Station Groups. Station Groups dictate what station (internal) page group announcements will be heard over the station speaker and the Group - Pick up group to which the station belongs.

Range : 1-8
Default : 1

7.5.2.9 Warning Tone

Description:

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 (see Call Handling) has expired. Once engaged the tone will be heard every 10 seconds until the CO line call is terminated.

Range : "Y/N"
Default : "N"

7.5.2.10 Drop Time-out

Description:

Similar to Warning Tone above, 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 (see Call Handling) has expired. 10 seconds later the current call will be terminated.

Range : "Y/N"
Default : "N"

7.5.2.11 Station Position

Description:

Station numbering can be changed for any station port between the range of 10-81. 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.

Range : 10-81
Default : For ports 1-24 the B1 channel is 10-33 and the B2 channel is 58-81

7.5.2.12 Voice Mail Port

Description:

Single Line Telephone ports that are to be used for connection to a Voice Mail system must be assigned type "VM". This identifies the port to the system software for special handling.

Range : "Y/N"
Default : "N"

7.5.3 CO Line

Description:

When the Show CO Line prompt is displayed the programmer should enter the two-digit CO line number to be programmed. (Note: when CO line 1 is to be programmed enter a "01". When CO line 12 is to be programmed, enter "12".) Once entered the center Soft Button "**show**" is pressed to enter into CO Line programming parameters for that CO line number.

Range : 01-12
Default : N/A

7.5.3.1 Dialing

Description:

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

Range : TONE/PULSE
Default : TONE

7.5.3.2 Call Abandon

Description:

Call Abandon is a CO line setting that monitors the CO line for distant party hang up. When set to "Y" the Starplus DHS 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.

Note: 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.

Range : "Y/N"
Default : "Y"

7.5.3.3 CO Line Type

Description:

A CO Line Type is selected to identify specific CO lines. Type "CO" designates a typical CO line connection. Type "PBX" 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 Number Redial features will reference the programmed PBX code to insert a Pause between the PBX code and the remaining dialed digits.

A third CO Line Type "OPN" is made available so that the programmer can mark CO line positions equipped in the system but not connected to any telephone company CO line facility.

This instructs the system software to bypass this CO line for any automatic or pooled (group) access of CO lines.

Range : CO/PBX/OPN
Default : CO

7.5.3.4 Loud Bell

Description:

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.

Range : "Y/N"
Default : "N"

7.5.3.5 CO Line Group

Description:

There are four CO line group assignments that may be assigned to CO lines. Grouping is usually done to segment CO lines into group types (i.e. CO, PBX, WATS, FX, etc.). CO line grouping allows system users to dial access to a particular CO line type by group access codes.

When CO line groups are accessed the higher number idle CO line is selected as the first choice. (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.)

Range : 1-4
Default : 1

7.5.3.6 Private To

Description:

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.

Range : 10-81
Default : EMPTY

7.5.3.7 Toll Override

Description:

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

Range : "Y/N"
Default : "N"

7.5.3.8 Distinct Tone

Description:

Distinctive Tones can be used to identify a particular CO line while ringing. There are four distinctive tones that can be programmed. The default setting "0" indicates that there is no distinct tone programmed. In this case ringing will follow the ringing tone selected at the station via the user invoked feature Distinctive Ringing (Station). The user feature code F#7

may be used to determine what tone will be used for the tone selection in Distinct Tone. (The tones are the same.)

Range : 0/1/2/3/4
Default : 0

7.5.3.9 †ICLID Port (Incoming Caller ID/PC Programming Port)

Description:

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 Starplus DHS KSU via an external ancillary device connected to the Option Module ICLID/PC Programming RS-232 port. This external (optional) device must be configured in the Starplus DHS to associate the line circuit number from the unit to the DHS 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 Starplus DHS on CO line position 1 and connected to the ICLID device - position 4; CO line 1 of the DHS must be programmed for ICLID Port "04".

Each DHS 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.)(Note: Wait_ICLID time in Call Handling must also be programmed to allow the DHS system to collect the caller ID data before ringing any system telephones.)

Range : 0-12
Default : 0

7.5.4 Call Handling

7.5.4.1 Privacy Release

Description:

Privacy 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 Privacy 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.

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

Range : "Y/N"
Default : "N"

Notice: Disabling of the Privacy feature may be limited by federal, state or local law, so check the relevant laws in your area before disabling privacy.

† ICLID use requires the Option Module.

7.5.4.2 Privacy Release Tone

Description:

Privacy Release Tone works in conjunction with Privacy Release. 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 Privacy Release. When set to "N", no tone is heard. Disabling the tone can be useful for monitoring of call group employees and training requirements.

Range : "Y/N"
Default : "Y"

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

7.5.4.3 Exclusive Hold Time

Description:

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.

Range : 0-8 minutes (where 0 is infinite)
Default : 4 minutes

7.5.4.4 Flash Time

Description:

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 milliseconds to 800 milliseconds 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 seconds (1500 milliseconds).

Range : 0.1 seconds (100 milliseconds) to 1.5 (1500 milliseconds)
Default : 0.7 seconds (700 milliseconds)

7.5.4.5 Remind Time

Description:

CO line calls placed on System Hold will remain on System Hold until answered. 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.

Range : 0/10/30/60/90 seconds
Default : 30 seconds

7.5.4.6 Park Remind

Description:

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

Range : 30/60/90/120/150/180 seconds
Default : 30 seconds

7.5.4.7 Pause Time

Description:

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.

Range : 1.5/2/3.5/5 seconds
Default : 2 seconds

7.5.4.8 PBX Code

Description:

One PBX Code may be assigned in the system. This code will be referenced each time a user accesses a CO line marked type "PBX". The first digit dialed on a PBX line will be monitored for a match against this digit. If the first dialed digit and the programmed PBX Code digit match, restriction is applied on all digits following this digit. (The PBX Code is usually the digit dialed on a PBX line to access a PBX trunk for out dialing.)

In addition, Last Number Redial, Auto Busy Redial and the Saved Number Redial functions use this programming to automatically insert a pause between the PBX Code dialed and any subsequent dialed digits to allow the PBX time to generate outside (trunk) dial tone before sending digits to dial on the trunk.

Range : 00-99
Default : 9

7.5.4.9 PBX Auto Pause

Description:

Used in association with the PBX Code programmed above, when the system detects a PBX code dialed on a PBX type line, the pause time programmed here is inserted between the dialed PBX code and any remaining digits.

Range : 1-9 second
Default : 1 second

7.5.4.10 Dialing Ratio

Description:

The Starplus DHS provides precise digit dialing by means of timed DTMF digit on-time and timed inter-digit time ("Senderized" dialing). This function virtually eliminates mis-dialed telephone numbers. The factory default setting will typically work in every installation and will not require adjustment. However, if the system is installed where the telephone company equipment is aged or poor line conditions exist, it may be necessary to increase digit duration and inter-digit timing. 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.

Range : TONE TIME and INT_DGT TIME are adjustable from 50 ms (milliseconds) to 150 ms
Default : TONE TIME and INT_DGT TIME are set at 70 milliseconds

7.5.4.11 VM Dialing Ratio

Description:

The VM Dialing Ratio parameter is provided for interface of an on-site voice mail system. Since voice mail systems may emulate an auto-attendant or other modes that require DTMF signaling through a recorded announcement, DTMF signals sent to the voice mail system via the VM Port often require digit duration's longer than those desired for CO line dialing. The VM Dialing Ratio allows the programmer to adjust the DTMF digit and inter-digit duration specifically for use on these VM Ports.

There are two VM Dialing Ratio parameters that may be programmed; TONE TIME and INT_DGT TIME.

Range : TONE TIME and INT_DGT TIME are adjustable from 60 ms (milliseconds) to 150 ms
Default : TONE TIME and INT_DGT TIME are set at 120 milliseconds

7.5.4.12 Warning Time

Description:

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.

Range : 1-8 minutes
Default : 3 minutes

7.5.4.13 Recall Time

Description:

Recall Time is associated to CO Line Transfer. When the CO line has been transferred to another station it will transfer ring at that station for the duration of the Recall Time. When the Recall Time expires the CO line will begin ringing at the station that initially transferred the call.

Range : 16/30/60/90/120 seconds
Default : 30 seconds

7.5.4.14 SLT Hook Flash

Description:

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 Starplus DHS 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 seconds (800 ms),

however users may also use the hook switch to disconnect the current call and request dial tone for a second call. If this operation occurs too quickly the system will interpret the request as a hook flash request. For this reason the hook flash timing may be adjusted to cater to the practices of the user.

Note: 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 SLT operation and performance.

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. Note: if the SLT station user stays on-hook for any time exceeding the END time programmed, the previous call will be disconnected.

Range: START 60/100/200/300/400/500/600/700/800/900/1000/1100/1200/1300/1400
END 100/200/300/400/500/600/700/800/900/1000/1100/1200/1300/1400/1500
Default : START 300 milliseconds
END 800 milliseconds

Note: The system software will always maintain a hook flash time of 100 milliseconds minimum. It is not possible to program a hook flash time that provides no hook flash operation time.

7.5.4.15 DISA (Direct Inward System Access)

Description:

Any CO line(s) may be programmed as DISA lines. Calls ringing into the system on CO lines designated as DISA lines will be automatically answered by the system and allowed to access system resources (stations and CO lines). A special DISA code must be entered to allow access of CO lines for out going calling. Restrictions are imposed on DISA CO lines according to the COS assigned the DISA CO line.

There are six data fields associated to DISA programming; ACCESS CODE, DISA LINE, DISA DAY COS, DISA NITE COS, SERVICE and TALK TIME.

In DISA ACCESS CODE, 24 codes may be entered to check for out dialing privileges. DISA LINE is set to "Y" or "N" for any of the CO lines indicating its use as a DISA CO line. DISA DAY/NITE COS is assigned per CO line and assigns a restriction level to callers using DISA for out going calls. SERVICE allows the programmer to set the DISA operation to actuate during specific system modes. TALK TIME sets the preset time limit of any DISA call. (This time limit may be extended during operation if the user dials an * (asterisk). Doing so will allow the conversation to continue for a second period of time equal to the TALK TIME.)

Range : ACCESS CODE 24 codes maximum each 4 digits long
DISA LINE Y/N
DISA DAY COS 0-7
DISA NITE COS 0-7
SERVICE NEVER/DAY/NITE/ALWAYS
TALK TIME 1/2/3/5/10/15
Default : ACCESS CODE EMPTY
DISA LINE none assigned
DISA DAY COS 0
DISA NITE COS 0

SERVICE NEVER
TALK TIME 1

7.5.4.16 External Call Forward

Description:

One CO line in the system may be designated as the External Call Forward CO line. When this CO line rings it is automatically answered by the system and routed to another CO line where a predetermined telephone number is dialed. The two lines are connected together in a conference and allowed to remain connected for the duration of the TALK TIME.

Note: System Speed Dial bin 99 must be programmed with a telephone number that will be used as the ECF destination number for this feature to operate.

ECF programming has four data fields; INCOMING, OUTGOING, SERVICE and TALK TIME. INCOMING is the CO line to be answered by the system. OUTGOING is the CO line to be used by the system for the outgoing call. SERVICE is the setting that allows the feature to operate only during certain system modes of operation. TALK TIME is the preset time limit of the ECF call. (ECF may be disconnected prior to the expiration of the TALK TIME by the remote party by dialing "0#" at any time during the ECF call.)

Range : INCOMING 0-12
OUTGOING 0-12
SERVICE NEVER/DAY/NITE/ALWAYS
TALK TIME 1/2/3/5/10/15
Default : INCOMING 0
OUTGOING 0
SERVICE NEVER
TALK TIME 1

7.5.4.17 Unsupervised 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 "*".)

Range : 1/2/3/5/10/15
Default : 1 minute

7.5.4.18 Operator Code

Description:

The Operator Code may be changed from "0" to "9" to meet special application needs.

Range : 0/9
Default : 0

7.5.4.19 †Unsupervised Conference

Description:

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.

Range : Y/N
Default : Y

7.5.4.20 Auto Busy Redial

Description:

The Auto Busy Redial function will attempt to Redial a busy number for a preset number of attempts. Three data fields are programmed for ABR operation; ABR ATTEMPTS, ABR INTERVAL and 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).

TONE DET. TIME determines how long the system waits following the last digit dialed to connect the system Tone Detector. The default setting of 4 seconds should be adequate for most calls, however in some cases where the Central Office may be slower than usual or the number dialed requires a lot of time before any call progress tone is heard (some long distance calls may be affected), it is necessary to extend the TONE DET. TIME. The system has a built-in 2.5 second timer. The TONE DET. TIME Is added to this time; so at default the system waits 6.5 seconds after the last digit is dialed before it samples the line for call progress tones.

If you find that the system cancels an ABR attempt when the number dialed is busy, try extending the ABR - TONE DET. TIME. If you find that the user hears many busy tones for a dialed number that is busy before the system reacts to the busy signal, try shortening the ABR - TONE DET. TIME.

NOTE: The Option Module is required for ABR to function.

Range : ABR ATTEMPTS 0-10 (where "0" will not make any attempt)
ABR INTERVAL 16/30/60/90/120
TONE DET. TIME 0-9
Default : ABR ATTEMPTS 10
ABR INTERVAL 16 seconds
TONE DET. TIME 4

† Unsupervised Conference requires the Option Module for operation.

7.5.4.21 Call Abandon Time

Description:

Call Abandon Time is set for two 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.

Range : ACTIVE CALL 50 - 2500 milliseconds
HELD CALL 50 - 2500 milliseconds
Default : ACTIVE CALL 600 milliseconds
HELD CALL 600 milliseconds

7.5.4.22 Ring Alternate Position

Description:

One station may be assigned as the alternate answering position. CO calls that go unanswered at the attendant assigned telephone will ring at the Alternate Position following expiration of this timer.

Range : 30/60/90/120/150/180
Default : 30

7.5.4.23 Preset Forward - CO Line Preset Call Forward

Description:

Each CO line in the system may be preprogrammed 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, COxx DEST and COxx VMID. CO P-FWD TIME is one timer referenced by all CO lines set for preset forward. COxx DEST is the destination set for the CO line being programmed. COxx VMID is a six-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 COxx VMID field for each CO line.

Range : CO P-FWD TIME 6/10/16/22/30/40
COxx DEST 10-81 (stations)
(Hunt Groups/VM Groups)
COxx VMID 000000-999999
Default : CO P-FWD TIME 16
COxx DEST EMPTY
COxx VMID EMPTY

7.5.4.24 †Wait – ICLID

Description:

When Caller ID is equipped on the telephone company CO line, caller ID data is sent to the receiving party and equipment after the first ring signal and before the second ring signal. Since there is some tolerance in the time that is required to receive the signal, the DHS may be programmed to send ringing to programmed DHS telephones more quickly when caller ID data is received quickly. The DHS may also be programmed to wait longer for caller ID data in cases where the data is sent from the telephone company more slowly than the default consideration for the time required to collect the data.

(If you are not getting caller ID data consistently, try increasing this timer.)

Range : 3.5/4/4.5...7.0 seconds
Default : 4.0 seconds

7.5.4.25 VM MON Time

Description:

The Starplus DHS allows the user of any DHS key telephone to monitor callers leaving a message in their voice mail box in a similar fashion to monitoring callers via an answering machine. When a caller is routed from a ringing telephone to the user's voice mail box, an alert is presented to advise the user that the feature can be invoked. This option is removed automatically after the time programmed for "VM MON Time".

Range : 10/20/30/40/50/60
Default : 10

7.5.5 Resource

7.5.5.1 Ring Scheme

Description:

The system may be set to three different ringing schemes.

	Scheme 0	Scheme 1	Scheme 2
ICM Tone Ringing	1s ON, 3s OFF	1s ON, 3s OFF	300ms ON, 400ms OFF, 300ms ON, 4s OFF
CO Line Ringing	300ms ON, 400ms OFF, 300ms ON, 4s OFF	1s ON, 3s OFF	1s ON, 3s OFF

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.

Range : 0/1/2
Default : 2

† Caller ID requires the Option Module and an ancillary caller ID collection device for operation.

7.5.5.2 Letter Type

Description:

The displayed characters for the messaging features and the Name in Display feature can be adjusted to accommodate special character requirements. When programming display messages the digit "1" dial pad key is pressed to insert special characters. One of six possible Letter Types may be selected for use when dial pad key "1" is pressed multiple times. Use the chart at the right to determine which Lettering Type Scheme is desired for this installation. While viewing Letter Type inn the programming mode, press the **chg** Soft Button to select the desired scheme.

	Character for nth depressions of dial key "1".					
	1st	2nd	3rd	4th	5th	6th
Scheme 0	Æ	Ë	ø	Ø	à	À
Scheme 1	Ç	Ā	Ō	Ñ	Á	Ä
Scheme 2	Ò	É	é	è	à	Ù
Scheme 3	Č	Ď	É	Ň	Ō	Ř
Scheme 4	Á	É	Ó	Ü	Ú	
Scheme 5	Ł	Ż	Ą	Ę		

Range : 0/1/2/3/4/5
Default : 0

7.5.5.3 Attendant

Description:

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

Range : 1-81
Default : 10

7.5.5.4 Alternate

Description:

One station may be assigned the Alternate Position. This station will receive all CO ringing in over-flow fashion from the attendant station. When calls ring longer than the Ring Alternate Position Time, these calls will begin to ring at the Alternate station.

Range : 10-81
Default : EMPTY

7.5.5.5 System Alarm

Description:

Eight alert signals may be scheduled. When an alert time is reached all system stations will receive BGM over the telephone speaker for one minute. This feature can be useful in schedule sensitive applications.

Range : 00:00 - 23:59
Default : All eight are EMPTY

7.5.5.6 Nite Start

Description:

The system may be set to operate in Time mode which allows the system to automatically change Service Mode from Day to Night Mode and back again. This time can be set for one time each day. The Nite Start time will switch the system into Night Mode at the designated time.

Range : 00:00 - 23:59
Default : 17:00

7.5.5.7 Nite End

Description:

Nite End works in conjunction with Nite Start. The Nite End time entry designates when the system is to begin Day Mode operation.

Range : 00:00 - 23:59
Default : 08:00

7.5.5.8 Database Password

Description:

The default Database Programming Password may be changed from "000000" to any other six-digit numeral sequence.

Range : 000000-999999
Default : 000000

7.5.5.9 User Password

Description:

Each station in the system is assigned a default password of "0000". This may be changed if the associated security feature operation (Phone Lock, Remote COS, etc.) is required.

Range : 0000-9999
Default : 0000

7.5.5.10 User Names

Description:

A User Name may be assigned to each station in the system. This can be useful as an administrative aid as well as providing a user friendly prompt at display telephones while idle and during call processing. When a User Name is not programmed, the display at Executive Key Telephones will display "STATION". Multiple depressions of the dial pad keys cause alphabet characters to appear. Use the following chart when programming User Names.

Depressions:	1st	2nd	3rd
Key			
1	Used to display special characters from the six Letter Type schemes possible. Reference the Letter Type feature and associated programming on page 177.		
2	A	B	C
3	D	E	F
4	G	H	I
5	J	K	L
6	M	N	O
7	P	R	S
8	T	U	V
9	W	X	Y
*	• When pressed before any dial key is pressed the numeral of the dial key will be displayed in this character position. • When pressed after a letter has been selected for this character position, the selected letter is forced to lower case.		
0	Q	Z	"_" and moves to the next position.
#	(space) and moves to the next position		

Range : 7 characters maximum.
Default : EMPTY

7.5.5.11 Preprogrammed Messages

Description:

Station messaging is enhanced at the Executive Key Telephone by use of Programmed Messaging. There are two types of Preprogrammed Messages; OUTGOING MESSAGE and EXECUTIVE NOTIFY. The OUTGOING MESSAGE works with Message Waiting and allows the Executive Key Telephone user to leave a text message at another Executive Key Telephone.

EXECUTIVE NOTIFY is a message that 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 the Executive Notify feature enabled.

The first message prompted at the Executive Telephone for both OUTGOING MESSAGE and EXECUTIVE NOTIFY can be customized by the user during setup. The remaining messages can be preprogrammed here.

Range : Messages may be 16 characters or less.
Default : OUTGOING messages; CALL OPERATOR, CALL HOME, CALL SCHOOL, VISITORS WAITING, URGENT, COME SEE M.
EXECUTIVE NOTIFY messages: OUT FOR LUNCH, BE BACK SOON, LEFT FOR THE DAY, IN A MEETING, OUT OF OFFICE, ON VACATION

7.5.5.12 System Speed Numbers

Description:

There are 80 System Speed Dial Numbers that can be programmed for access by stations according to COS assignments. Stations with COS 0-5 can access all 80 System Speed Dial Numbers. Stations with COS 6 can access only System Speed Dial Numbers 20-39. Stations with COS 7 cannot use System Speed Dial Numbers.

Notes:

1. System Speed Dial Numbers over-ride station dialing restrictions.
2. System Speed Dial Numbers may be chained for increased capacity.
3. To enter a CO Line Flash in a Speed Dial bin enter "F"+3 (where "F" is the FEAT button).
4. To enter a Pause in a Speed Dial bin enter "F"+70 (where "F" is the FEAT button).
5. To enter a bin chaining command (@) in a Speed Dial bin enter "F"+1+nn (where "F" is the FEAT button and "nn" is the speed dial bin number to attach to the end of this speed bin).
6. When the code "F70" or "F3" are entered into a speed dial bin they occupy one digit position.
7. When the code "F1nn" is entered into a speed dial bin it occupies three digit positions.
8. System Speed Dial bin 99 is used for External Call Forward when that feature is used.
9. Regardless of speed bin chaining, no speed dial number can exceed 32 digits in length.
10. System Speed Dial Numbers can also be programmed through Attendant Administration using the Attendant station's password.

*Range : 0-9, *, #, pause (F70), flash (F3) and F1nn (chaining). 16 char. max.*
Default : All are EMPTY

7.5.5.13 BGM

Description:

When the Option Module is installed 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 (F52), only the first music channel source (MOH) will be toggled at the telephone. When set to "Y" both music channels will be toggled by successive operations of the BGM code (F52).

Range : Y/N
Default : Y

7.5.5.14 CO Line Copy

Description:

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 fields to another.

Range : N/A
Default : N/A

7.5.5.15 Station Copy

Description:

Station Copy is provided to assist in programming multiple stations with the same data. Follow the displayed instructions to copy one station's data fields to another.

Range : N/A
Default : N/A

7.5.5.16 Feature Button Copy

Description:

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.

Range : N/A
Default : N/A

7.5.5.17 System Time

Description:

Provided to set system time and date information. Use the prompts displayed to set the fields; YEAR, MONTH, DAY, WEEKDAY, HOUR and MINUTE.

Note: System Time can also be set through Attendant Administration using the Attendant station's password.

Range : N/A
Default : N/A

7.5.5.18 Account Code Table

Description:

When a station is Forced Account Code (that is they must enter an account code to dial any outside telephone number), the account code entered is verified against the entries in this table. Up to 100 entries may be made in the Account Code Table. The account code length may be four to eight digits in length to increase the security of valid account code entry.

Range : LENGTH 4-8, bins 001-100 : 0000-99999999
Default : LENGTH 4, bins 001-100 : EMPTY

7.5.5.19 Data Link

Description:

The Data Link programming option is not implemented at this time. This is a future CTI function.

Range :
Default :

7.5.5.20 RMT X_RATE (Remote Terminal Transmission Rate)

Description:

When the Option Module is installed the DB-9 pin RS-232 port labeled "REMOTE PROGRAMMING" can be connected to a modem or directly to a Personal Computer to use the PC based Database Programming software. RMT X_RATE is the baud rate setting of this port.

Range : 110/300/600/1200/2400/4800/9600/19200 BPS
Default : 9600 BPS

7.5.5.21 SMDRX_RATE (SMDR Transmission Rate)

Description:

When the Option Module is installed the DB-9 RS-232 port labeled "SMDR" can be connected to a printer, Personal Computer or other call accounting collection device to collect Station Message Detail Recording. SMDRX_RATE is the baud rate setting of this port.

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

Range : 110/300/600/1200/2400/4800/9600/19200 BPS
Default : 9600 BPS

7.5.5.22 Hour Mode

Description:

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

Range : 12/24
Default : 12 Hour format

7.5.5.23 Dial Tone Detect

Description:

In some applications Central Office equipment may be aged or line treatment may be applied to CO lines such that dial tone is slow when a station accesses a CO line to dial out or when using system dialing automation features like LNR, SNR and ABR. This situation often represents a problem since dialing on the CO line may begin before dial tone is available to receive the digits dialed.

When the Option Module is installed the system Tone Detectors (on that module) 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.

NOTE: Dial Tone Detect requires the Option Module to function. 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.

Range : Y/N
Default : N

7.5.5.24 Dial Wait Time

Description:

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 Option Module is not installed or 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.

Range : 0-8
Default : 0 (no delay)

7.5.5.25 KSU Revision

Description:

This data parameter is provided as a convenience to easily determine the KSU software version installed. When the programmer presses **show** the current KSU software version is displayed.

Range : N/A
Default : N/A

7.5.6 Restriction

7.5.6.1 CO LN CALL DISCR - DGT INTERVAL

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 NITE ALLOWED. The From and To data fields allow the programmer to enter a range of allowed digits up to ten digits each in length. This flexibility allows the programmer to enter only the digits significant to the dialing restriction desired. (Note: the words "From" and "To" are not displayed, rather the From table is denoted with a "–" symbol following the table entry and the To table is denoted with a "–" symbol preceding the table entry.)

Consider the default entry in Table bin 001 where the From entry is "0" and the To entry is "9". In this case (default) stations assigned a COS corresponding to the table (all stations at default) can dial any telephone number so long as the first dialed digit is a 0-9. Note that at default all stations are restricted from dialing a "*" or "#" as the first dialed digit.

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.

The data fields DAY ALLOWED and NITE ALLOWED enable the programmer to assign any Day/Night COS to operate with the table entry. There is a separate DAY/NITE ALLOWED field for each table entry for complete flexibility in dialing restriction assignment.

*Range : Table bins 001-100: 0000000000-9999999999, ##########, **********; COS 0-7 Y/N*
Default : Table bin 001 0-9, COS 0 Y, COS 1-7 N

7.5.7 System Application

7.5.7.1 Station Hunt Group

Description:

Up to eight hunt groups may be assigned. Hunting is always in a linear fashion. Each Hunt Group can contain 24 members. Hunt Group directory numbers are 82-89. One Hunt Group may be assigned as a Voice Mail type Hunt Group for system voice mail integrated operation. There are three data fields in hunt group programming; GROUP TYPE, GROUP MEMBER and RING ASSIGNMENT.

GROUP TYPE available settings are; HUNT, VM and ALLRG. A Hunt Group assigned as type HUNT will perform a search for the first available, idle telephone member of the hunt group according to the order of programmed entry. A Hunt Group assigned as type VM will integrate voice mail control digits for calls placed to the hunt group. Only one VM type hunt group is allowed per system. The members of this hunt group should only be SLT ports and those ports should also be marked as VM type in Station programming. Finally, a hunt group assigned as type ALLRG will ring all telephone members simultaneously when the hunt group number is dialed.

GROUP MEMBER is used to program the station members of this hunt group. RING ASSIGNMENT is used to program ringing of CO lines into this hunt group.

RING ASSIGNMENT is used to assign ringing of CO lines to a hunt group. Ringing may be programming individually for each of the 12 CO lines and each of the 8 hunt groups. Ringing is available for the various modes of operation (Day, Night, Both).

Range : GROUP TYPE; HUNT/VM/ALLRG
GROUP MEMBER; 10-81
RING ASSIGNMENT; NONE/DAY/NITE/BOTH
Default : GROUP TYPE; HUNT
RING ASSIGNMENT; NONE
GROUP MEMBER; EMPTY

7.5.7.2 Voice Mail

Description:

When a voice mail system is connected to the Starplus DHS 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 Starplus DHS provides six code strings fields; ICM PREFIX, XFR PREFIX, RECORD DGT, ICM SUFFIX, XFR SUFFIX and DIS DGT. The Starplus DHS always sends the station directory number to the voice mail system for calls that are forwarded to VM from a station. These digits are either preceded or appended with the digits programmed into the six fields.

ICM PREFIX (Intercom Prefix) digits are digits that must proceed the station directory number when a station user calls VM to retrieve messages. When programmed correctly the station user will be delivered to his voice mail box and prompted to enter his password. The Intercom Prefix may be 4 digits in length.

XFR PREFIX (Transfer Prefix) digits are digits that must proceed the station directory number when a CO line call is transferred to VM. When programmed correctly a call that is transferred to VM will be prompted by the station users mail box greeting prompt and may leave a message without further dial code digit entry. The Transfer Prefix may be 4 digits in length.

RECORD DGT (Record Digits), these digits are sent to the VM system to speed the connection at the voice record level. These digits are used only with the Voice Recorder feature. When a key telephone station user wants to record a call he may invoke the Voice Recorder feature to do so. The RECORD DGT digits are sent to the VM system after the voice mail box digits to skip the user's introduction and begin recording.

ICM SUFFIX (Intercom Suffix) these digits are applied to intercom calls placed to the VM system as an aid to direct the caller to his personal greeting where he is required to enter only his password to retrieve messages. Digits programmed as Suffix Digits will be appended to the station directory number. That is, after the station directory number is sent to the VM system the Suffix Digits will then be sent. The Suffix may be 2 digits in length.

XFR SUFFIX (Transfer Suffix) these digits are applied to calls that are transferred to the VM system. They are used to direct the caller to the mailbox owners greeting and subsequent message recorder. Digits programmed as Transfer Suffix digits will be appended to the station directory number. That is, after the station directory number is sent to the VM system the Suffix Digits will then be sent. The Suffix may be 2 digits in length.

DIS DGT (Disconnect Digits) these digits will be sent (without station directory number digits) to the voice mail system whenever a station user listening to voice messages disconnects or when a CO line caller hangs up while leaving or listening to messages. The purpose of the Disconnect Digits is to make the voice mail port available to new voice mail callers quickly. Disconnect Digits may be 8 digits in length.

*Range : ICM PREFIX; 0000-9999, ****, ####*
*XFR PREFIX; 0000-9999, ****, ####*
*RECORD DGT; 0000-9999, ****, ####*
*ICM SUFFIX 00-99, **, ##*
*XFR SUFFIX 00-99, **, ##*
*DISC. DGT; 00000000-99999999, ********, ########*
Default : ICM PREFIX: EMPTY
XFR PREFIX: EMPTY
RECORD DGT: EMPTY
ICM SUFFIX: EMPTY
XFR SUFFIX: EMPTY
DIS DGT: EMPTY

8. MAINTENANCE AND TROUBLE SHOOTING

Maintaining the Starplus DHS 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.

When installed properly the Starplus DHS 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.

The System trouble-shooting procedures 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. 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 <u>not</u> the result of a system component or software failure.

The System Trouble-shooting Section attempts to provide the service technician with some quick, and reliable, tools to diagnose installation related or service related problem reports.

8.1.1 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.

8.2 CPU/Power LED

The CPU/Power heartbeat LED is located on the front of the KSU adjacent to the power switch. If the AC input and DC output power circuits are operating, the LED will be on steady. If the CPU is running, not locked up or failed, the LED should be flashing at a fast rate. The Initialization switch should be in the right ("ON") position.

Symptom	Diagnostic aid	Cause	Action
No system operation. LCD telephones have no display. No LED's lit at any telephones.	CPU Heartbeat / Power LED Dark	No AC input KSU Cord Power On Switch AC Fuse DC Fuse	1. Check commercial AC outlet. Verify that both ends of AC cord are plugged in. Switch the KSU AC power switch to the "ON" position. Inspect and replace KSU exterior AC input fuse located on right side of KSU. Inspect and replace system DC output fuse located on the right side of KSU.

Symptom	Diagnostic aid	Cause	Action
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 / Power LED Lit	Initialization Switch	1. Verify initialization switch operated to the "ON" position (located along the bottom edge of the CPU Module inside the KSU). When the Initialization switch is in the "ON" position it is toward the right. If the Initialization switch is not in the "ON" position at the time the KSU is powered, the Power Up Initialization sequence at the end of the Installation section should be followed. If the system was properly initialized proceed to step 2. Power down/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. Power down. Remove KSU cover and detach all station cabling (25 pairs) 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. Power down. Inspect for the following: Loose or unplugged 3X8 Expansion Module, 6 Port CO Module or Option Module ribbon cables. Improperly aligned ribbon cables. Improper installation of the system software EPROM located in socket U9 CPU Module. Operate the initialization switch to the "OFF" (left) position. **NOTE: This is an emergency action since the unique battery protected customer database will be erased and system will boot up with the default programming.** Return initialization switch to "ON" (right) position. If CPU/POWER LED is still not flashing, replace KSU. Initialize and test according to the Power Up Initialization sequence.

8.3 Key Telephone / SLT telephones dead.

Symptom	Diagnostic aid	Cause	Action
Telephones/station apparatus dead.	CPU Heartbeat / Power LED flashing.	Shorted station pair(s).	1. At MDF, remove cross connect (jumper) wires at the punch-down (66M1-50) block going to all affected stations. Reconnect stations one by one verifying that each power up correctly.
	Key telephone		When one is found that will not power up; disconnect the telephone at the user location and replace with a **known working** telephone.
		Bad key 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 3X8 Module 66 block and the station cable 66 block. Then connect one station directly to the 3X8 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 25 pair cable from the 3X8 Module to the MDF.
			Once the 25 pair cable from the 3X8 Module to the MDF is inspected, repaired or replaced; connected the **known working** telephone directly to the 3X8 Module 66 block station pair.
		3X8 Module ribbon cable not properly aligned during installation.	If the telephone still will not properly power up, power down the system and inspect the 3X8 Module ribbon cable for properly aligned installation. If any problem exists here correct it and power up the system.

continued...

Key Telephone / SLT telephones dead cont.

Symptom	Diagnostic aid	Cause	Action
		3X8 Module bad. CPU Module bad.	10.If no problems can be found at the ribbon cable connector, replace the 3X8 Module. 11.If the problem persists, replace the KSU.
NOTE:	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 KSU 3X8 Module circuitry.		

8.4 Erratic Key Telephone operation.

Symptom	Diagnostic aid	Cause	Action
Erratic operation Erratic LED's Erratic LCD Display 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 the cable: 1. With station cable cross connect (jumper) wire removed and key telephone unplugged, place a short circuit across the inside wiring cable pair at the user (jack) end of the cable. 2. With a DVOM, measure the short circuit resistance one way. Compare to limits of the loop resistance in the Loop Resistance Chart in the Installation section. Each key telephone should operate on a dedicated, unshielded, twisted pair cable, to avoid data noise and interference between adjacent cable pairs. A short circuit reading also indicates that the cable pair does not have an open (break).

8.5 Key Telephone Cannot Be Heard

Symptom	Diagnostic aid	Cause	Action
Other party cannot hear you. (handset)	Key telephone (other station)	Component Failure	1. Lift handset, dial another station. Talk. 2. Replace handset assembly and repeat Step 1. 3. Replace handset cord and repeat Step 1. 4. If still no transmit, the key telephone will need to be replaced.

8.6 Key Telephone Cannot Hear

Symptom	Diagnostic aid	Cause	Action
Cannot hear (handset).	Key telephone	Component Failure	1. Lift handset, ICM tone should be heard over the handset. 2. Press SPEAKER 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. 3. 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.
Note:	The above test sequence requires that the feature "Auto Select" be set for intercom operation ("ICM").		

8.7 Speakerphone Cannot Be Heard

Symptom	Diagnostic aid	Cause	Action
Other party can't hear you on your speakerphone.	Key telephone/Other Station	Connection, component failure	1. Press ICM and listen for ICM tone the over speaker. Call a known good working station. The distant party should be using the handset. **NOTE: The Basic key telephone does not provide speakerphone operation.** 2. If other party cannot hear you, lift handset and verify proper handset operation. 3. Remove key telephone top housing (do not unplug ribbon cables) and inspect the microphone located at the front right corner of the plastic button housing. Insure that the microphone is securely attached to the main PCB. 4. Re-assemble and repeat Step 1. If the connected station still cannot hear you, replace the key telephone.

8.8 No Sound From Speaker

Symptom	Diagnostic aid	Cause	Action
No sound over speaker.	Key telephone	Connection, component failure	1. Press SPEAKER button (red LED). 2. If you can hear ICM tone over the handset, but not the speaker, replace the key telephone.

8.9 Static / Noise During Conversation

Symptom	Diagnostic aid	Cause	Action
Static and/or noise can be heard during a conversation.	Logic of elimination		1. Can you hear the static now? If so, is it on intercom handset to handset calls?
			2. 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.	3. If static on ICM and CO line calls, verify wall jack connection & MDF connections. Correct any problems found.
		Bad component.	4. If noise persists, replace handset cord.
		Telco problem.	5. If static only on outside CO calls, do other stations hear similar static noise?
		Telco problem.	6. If other stations hear static, is it only on one CO line? Which one?
		Telco problem.	7. 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	8. 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 modules (3X8 and 6 Port CO).
		Possible module problem.	9. 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.
			10.Call Customer Service.

8.10 Other CO Line Problems

Symptom	Diagnostic aid	Cause	Action
Holding line, no one there.	System Programming		1. 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.	2. 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.	3. 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.

8.11 Lines Stay Busy

Symptom	Diagnostic aid	Cause	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, Programming error	Verify CO line programming for DISA, External Call Forwarding, and Day/Nite Service. The system will hold up certain trunk-to-trunk calls until a forced disconnect interval time is reached.

8.12 Button Programming is Lost/Changed at One Key telephone

Symptom	Diagnostic aid	Cause	Action
1.SLT users cannot access CO lines by dialing "9" and cannot access an idle trunk in a Trunk Group when dialing "*4N". 2.Key telephone users cannot program a Trunk Group to appear under one feature key.	Executive Key telephone	Improper system database programming. If the system configuration is determined to be a key system, then according to FCC Rules and local Telco tariffs, dial or button access of trunks by trunk group is not allowed.	If system configuration desired is PBX (or hybrid operation) and the local Telco is notified of the appropriate "MF" hybrid/PBX FCC Registration Number, then change system operation type in database programming to "PBX".

8.13 Button Programming is Lost/Changed at One Key telephone

Symptom	Diagnostic aid	Cause	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. 3. Feature button program memory is retained at the KSU, memory protected by a Ni-Cad battery. If system power is removed for longer than 7 days, all system database programming may be lost and default database loaded. This would, however, affect other customer unique system programming along with all other key telephones feature button programming.

APPENDIX 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.

Please makes copies of these forms prior to use. Use copies (or multiple copies) for actual programming work sheets. (Hint: enlargement to 120% of the manual page will fill an 8½ by 11 page.)

Database Programming - System Type

Data Parameter:	Default	Range	New Value
System Type	PBX	PBX/KEY	

Database Programming - CO Line Data

Data Parameter:	Default	Range:	New CO line values-->	1	2	3	4	5	6	7	8	9	10	11	12
Dialing Type	Tone	Tone/Pulse													
Call Abandon	Y	Y/N													
CO Line Type	CO	CO/PBX/EMPTY													
Loud Bell	N	Y/N													
CO Line Group	1	1-4													
Private To	EMPTY	10-81/EMPTY													
Toll Override	N	Y/N													
Distinct Tone	0	0/1/2/3/4													
ICLID Port	0	0-12													

Database Programming - Station Data

Data Parameter:		Default	Range:	New Assignments: Sta → 10	11	12	13	14	15	16	17
Day COS		0	0-7								
Night COS		0	0-7								
CO Line	1	Y	Y/N								
Assignment	2	Y	Y/N								
	3	Y	Y/N								
	4	Y	Y/N								
	5	Y	Y/N								
	6	Y	Y/N								
	7	Y	Y/N								
	8	Y	Y/N								
	9	Y	Y/N								
	10	Y	Y/N								
	11	Y	Y/N								
	12	Y	Y/N								
CO Line	1	Y	Y/N								
Receive	2	Y	Y/N								
Assignment	3	Y	Y/N								
	4	Y	Y/N								
	5	Y	Y/N								
	6	Y	Y/N								
	7	Y	Y/N								
	8	Y	Y/N								
	9	Y	Y/N								
	10	Y	Y/N								
	11	Y	Y/N								
	12	Y	Y/N								
	1	Sta 10 - BOTH	DAY/NITE/								
CO Line			BOTH/NONE								
Ring	2	Sta 10 – BOTH	"								
Assignment	3	Sta 10 – BOTH	"								
	4	Sta 10 – BOTH	"								
	5	Sta 10 – BOTH	"								
	6	Sta 10 – BOTH	"								
	7	Sta 10 – BOTH	"								
	8	Sta 10 – BOTH	"								
	9	Sta 10 – BOTH	"								
	10	Sta 10 – BOTH	"								
	11	Sta 10 – BOTH	"								
	12	Sta 10 - BOTH	"								
AC Code Forc		N	Y/N								
Station Group		1	1								
Warning Tone		N	Y/N								
Drop Timeout		N	Y/N								
Sta Position		10...81	10-81								
VM Port		N	Y/N								

Database Programming - Call Handling Data

Data Parameter:				Default	Range	New Value
Privacy RLS				Y	Y/N	
Privacy RLS Tone				Y	Y/N	
Excl. Hold Time				4	0-8 Minutes	
Flash Time				0.7	0.1-1.5	
Remind Time				30	0/10/30/60/90	
Park Remind				30	30/60/90/120/150/180	
Pause Time				2	1.5/2/3.5/5	
PBX Code				9	0-9	
PBX Auto Pause				1	1-9	
Dialing Ratio	Tone Time			70	50/60/70...150	
	Inter-Digit Time			70	50/60/70...150	
VM Dialing Ratio	Tone Time			120	60/90/120/150	
	Inter-Digit Time			120	60/90/120/150	
Warning Time				3	1-8	
Recall Time				30	16/30/60/90/120	
SLT Hookflash	Start			300	60/100/200/300...1400	
	End			800	100/200/300...1500	
DISA	Access Code	01		EMPTY	0000-9999	
		⋮		EMPTY	0000-9999	
		⋮		EMPTY	0000-9999	
(Make copies of		24		EMPTY	0000-9999	
this form for	CO Line Attrib.	1	DISA Line	N	Y/N	
additional space			Day COS	0	0-7	
as required.)			Night COS	0	0-7	
			Service	NEVER	NEVER/DAY/NITE/ALWAYS	
			Talk Time	1	1-15	
		12	DISA Line	N	Y/N	
			Day COS	0	0-7	
			Night COS	0	0-7	
			Service	NEVER	NEVER/DAY/NITE/ALWAYS	
			Talk Time	1	1-15	
External Call Fwd	Incoming			0	0 (None), 1-12	
	Outgoing			0	0 (None), 1-12	
	Service			NEVER	NEVER/DAY/NITE/ALWAYS	
	Talk Time			1	1-15	
Uns. Conf. Time				1	1-15	
Operator Code				0	0/9	
Unsupervised Conf.				Y	Y/N	
Auto Busy Redial	ABR Attempts			10	0-10	
	ABR Interval			16	16/30/60/90/120	
	Tone Det. Time			4	0-9	
Call Abandon	Active Call			600	50-2500	
	Held Call			600	50-2500	
Ring Alt Position				30	30/60/90/120/150/180	
CO LN Preset	CO P-FWD Time			16	6/10/16/22/30/40	
FWD	CO Line Attrib.	1	VMID	EMPTY	000000-999999	
		2	VMID	EMPTY	000000-999999	
		⋮	VMID	EMPTY	000000-999999	
		12	VMID	EMPTY	000000-999999	
Wait-ICLID				4.0	3.5/4/4.5/5/5.5/...7	
VM MON Time				10	10/20/30/40/50/60	

Database Programming - System Application Data

Data Parameter:					Default	Range	New Value
Station Hunt Group	Hunt Group	1-24	Group Type		HUNT	HUNT/VM/ALLRG	
			Group Member	1	EMPTY	10-81	
				2	EMPTY	10-81	
				3	EMPTY	10-81	
				4	EMPTY	10-81	
				5	EMPTY	10-81	
				6	EMPTY	10-81	
				7	EMPTY	10-81	
				8	EMPTY	10-81	
				9	EMPTY	10-81	
				10	EMPTY	10-81	
				11	EMPTY	10-81	
				12	EMPTY	10-81	
				13	EMPTY	10-81	
				14	EMPTY	10-81	
				15	EMPTY	10-81	
				16	EMPTY	10-81	
				17	EMPTY	10-81	
				18	EMPTY	10-81	
				19	EMPTY	10-81	
				20	EMPTY	10-81	
				21	EMPTY	10-81	
				22	EMPTY	10-81	
				23	EMPTY	10-81	
				24	EMPTY	10-81	
			Ring Assignment	1	NONE	DAY/NITE/BOTH/NONE	
				2	N	Y/N	
				3	N	Y/N	
				4	N	Y/N	
				5	N	Y/N	
				6	N	Y/N	
				7	N	Y/N	
				8	N	Y/N	
				9	N	Y/N	
				10	N	Y/N	
				11	N	Y/N	
				12	N	Y/N	
Voice Mail	ICM Prefix				EMPTY	0000-9999, P, *, #	
	XFR Prefix				EMPTY	0000-9999, P, *, #	
	RECORD DGT				EMPTY	0000-9999, P, *, #	
	ICM Suffix				EMPTY	00-99, P, *, #	
	XFR Suffix				EMPTY	00-99, P, *, #	
	Disconnect Digit				EMPTY	00000000-99999999, P, *, #	

Database Programming - Restriction Data

CO Line Call Descrimination		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
Interval: (default shown)	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																		
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	037																		
	038																		
	039																		
	040																		
	041																		
	042																		
	043																		
	044																		
	045																		
	100																		

Database Programming - Resource Data

Data Parameter:		Default	Range	New Value
Ring Scheme		2	1/2/3/4	
Letter Type		0	0/1/2/3/4/5	
Attendant		10	10-33	
Alternate		EMPTY	10-33	
System Alarm	1	EMPTY	00:00-23:59	
		EMPTY	00:00-23:59	
		EMPTY	00:00-23:59	
	8	EMPTY	00:00-23:59	
Night Start		17:00	00:00-23:59	
Nite End		08:00	00:00-23:59	
DB Programming Password		000000	000000-999999	
User Password	10	0000	0000-9999	
	11	0000	0000-9999	
	12	0000	0000-9999	
	13	0000	0000-9999	
	14	0000	0000-9999	
	15	0000	0000-9999	
	16	0000	0000-9999	
	17	0000	0000-9999	
User Names	10	EMPTY	7 Characters max.	
	11	EMPTY	7 Characters max.	
	12	EMPTY	7 Characters max.	
	13	EMPTY	7 Characters max.	
	14	EMPTY	7 Characters max.	
	15	EMPTY	7 Characters max.	
	16	EMPTY	7 Characters max.	
	17	EMPTY	7 Characters max.	
Preprogrammed Messages	Outgoing	CALL OPERATOR	16 Characters max.	
		CALL HOME	16 Characters max.	
		CALL SCHOOL	16 Characters max.	
		VISITORS WAITING	16 Characters max.	
		URGENT	16 Characters max.	
		COME SEE ME	16 Characters max.	
	Executive Notify	OUT FOR LUNCH	16 Characters max.	
		BE BACK SOON	16 Characters max.	
		LEFT FOR THE DAY	16 Characters max.	
		IN A MEETING	16 Characters max.	
		OUT OF OFFICE	16 Characters max.	
		ON VACATION	16 Characters max.	

Database Programming - Resource (continued)
System Speed Dial

(Note when External Call Forward is used, System Speed Dial bin 99 exclusively is used for the number to dial when calls are routed via ECF.)

20		40		60		80	
21		41		61		81	
22		42		62		82	
23		43		63		83	
24		44		64		84	
25		45		65		85	
26		46		66		86	
27		47		67		87	
28		48		68		88	
29		49		69		89	
30		50		70		90	
31		51		71		91	
32		52		72		92	
33		53		73		93	
34		54		74		94	
35		55		75		95	
36		56		76		96	
37		57		77		97	
38		58		78		98	
39		59		79		99	

Database Programming - Resource (continued)

Data Parameter:		Default	Range	New Value
BGM Source		Y	Y/N	
The data parameter fields: CO Line Copy, Extension Copy, Feature Button Copy and System Time are updated as required.				
Account Code Table	Length	4	4-8	
	001		012	
	002		013	
	003		014	
	004		015	
	005		016	
	006		017	
	007		018	
	008		019	
	009		020	
	010			
	011		100	
Data Link		MANUAL	MANUAL/AUTO	
RMT X_Rate PC Program port BPS		9600	110/300600/1200/2400/ 4800/9600/19200	
SMDRX_Rate SMDR port BPS		9600	110/300600/1200/2400/ 4800/9600/19200	
Hour Mode		12	12/24	
Dial Tone Detect		N	Y/N	
Dial Wait Time		0	0-8	
KSU Revision	Display only.			

APPENDIX B. SINGLE LINE TELEPHONE USER'S GUIDE

his appendix is prepared for duplication as needed. It is intended to be the master copy only. This page may be copied, two-sided for use as reference cards for SLT users. The binding will allow easy duplication while not removing the page. When enlarged to 120% of its original size the page fits a legal 8½ by 11 sheet of paper.

More detailed SLT (analog port) operation description can be found in the section titled Single Line Telephone Features Description and Operation.

Note: if the Operator Code is changed from "0" to "9" in database programming the directory number card descriptions must be changed to reflect that programming change.

SLT Feature Access Codes

Call - Make an intercom call (2 digits)	10-81
Call - Hunt Group	82-89
Call - Make an outside line call	9
Call - Make a line call on a specific line	*3+0-9, *, #
Call - Make a line call by line group (x = 0-4)	*4 + x
Call Back Intercom (idle/busy)	#91
Call Back Intercom Cancel	#*91
Call Forward Idle	#2+0+ss
Call Forward Busy	#2+1+ss
Call Forward Direct (all modes)	#2+2+ss
Call Forward - Calls From Station	#2+3+ss
Call Forward No Answer (x = 0/1/2/3/4)	#2+4+ss+x
†Call Forward Busy/No Answer (x = 0-4)	#2+5+ss+x
Call Forward Cancel	#2
Call Transfer where ss=station number	*F*ss
Call Brokering (ss = station number)	*F*#+ss
Call Pickup - Directed (ss = station number)	#53+ss
Call Pickup - Group	#54
Call Park by station (ss = station number)	#73+ss
Call Park Answer by CO Line (cc =CO num)	#73+0+cc
Camp On to busy station	2
Camp On-CO Line	#93
Camp On CO Line Cancel	#*93
Do Not Disturb	#4

† Indicates feature only available in Feature Package 2

Hold	*F*
Hold Retrieve	*6
Hold Retrieve from another station	*7+ ss
Last Number Redial (with line selection)	#8
†Line Flash	*F*+#3
Message Waiting - Send	#96
Message Waiting - Cancel	#*96
Operator (dial operator station)	0
Page All Stations	#500
Page External - paging speakers	#501
Paging All (Station and External)	#502
Paging by Station Group (g=group number)	#503+g
Page Meet Me Answer	#59
Speed Dialing	*1+ 00-99
SPEED Programming where nn=bin#. (00-19)	#1+nn
Station Alarm (Hour/Minute)	#92 + hh/mm
Station Alarm Cancel	#*92
Station Authority Use	#55
†Station Hot Line (d=0-9, x=destination)	##4+d+x
Station Lock	#97pppp#
Station Unlock	#97pppp*
Station Lock Password change (nnnn = new password)	#97pppp + nnnn
Voice Mail	#64
Voice Over Busy (while busy tone is heard)	#56
Note: "*F*" represents a Hook Flash.	

Call - Make Intercom Call:

- Lift handset.
- Dial the desired two-digit station, Hunt Group or VM Group number.

Call - Make Outside (line) call.

- Lift handset.
- Dial the line code.
  - 9 to access any line.
  - *3cc to access a specific line ("cc" is the line number)
  - *4g to access a line group ("g" is the group number 1-4, 0 for any group).

ion Authority Use [#55]

- Lift handset.
- Dial #55ssppppp ("ss" = the station number with the desired authority and "pppp" is that station's password.)

Call Brokering

- While on a call (intercom or line).
- Press Hook Flash.
- Intercom dial tone is heard.
- Dial Station # (xx) or CO line call.
- Press Hook Flash to switch between parties.

Hold

- While connected to a CO line or intercom call press Hook Flash.
- Hang up.

Hold Retrieve [*6]

- Lift the handset.
- Dial *6.

Hold Retrieve from another station [*7]

- Lift handset.
- Dial *7.
- Dial station number where call is holding.

Call Operator [0]

- Lift handset
- Dial 0.

Call Transfer

- When on a call press hook flash.
- Dial station number.
- Hang up to complete the transfer.

†Line Flash (CO line hook flash)

- When on a call press hook flash
- dial #3

Do Not Disturb (DND) [#4]

- Lift handset.
- Dial #4
- Confirmation tone is heard.
- Hang up. DND is active.
- Repeat to cancel:

Call Forward - Idle

- lift handset
- dial #20xx ("xx" is destination)

Call Forward - Busy

- lift handset.
- dial #21xx ("xx" is destination)

Call Forward - Direct

- lift handset.
- dial #22xx ("xx" is destination)

Call Forward - No Answer

- lift handset.
- dial #24xxt ("xx" is destination and "t" is the Time to ring before forwarding: 1=10 seconds, 2=20 seconds, 3=30 seconds and 4=40 seconds.)

Call Forward - Calls From

- lift handset
- dial #23ssppppp ("ss" is the station from which calls are to be forwarded and "pppp" is the password of the same station.

†Call Forward - Busy/No Ans.

- lift handset
- dial #25xxt ("xx" is destination and "t" is the Time to ring before forwarding: 1=10 seconds, 2=20 seconds, 3=30 seconds and 4=40 seconds.)

Speed Dialing [*1]

- To dial:
  - Lift handset.
  - Dial *1 + bin (00-99)
- To program:
  - Lift handset.
  - Dial #1, silence is heard.
  - Dial SPD bin to be programmed. (Station Speed Dial bins range from 00-19.)
  - Enter the desired outside phone number.
  - Press Hook Flash.
  - Confirmation Tone is heard.

Call Park/Call Park Answer[#73]

- Lift handset
- dial #73 + 0 + c ("c" may be 1-9 for CO lines 1-9, 0 for CO 10, * for CO 11 or # for CO 12)

or

- dial #73 + sn ("sn" = Station where call is parked)

Call Pickup - Direct [#53]

- Lift handset
- dial #53 + sn ("sn" is the ringing Station Number)

Call Pickup - Group) [#54]

- Lift handset
- dial #54

Camp On - Busy Station [2]

- dial 2 when hearing to Busy Tone.

Camp On - Busy CO Line

- dial #93 (while listening to busy).

To cancel CO line Camp On

- Lift handset
- dial #93.

Station Alarm [#92]

- Lift handset
- #92hhmm (hh = hour in military format, mm = minute).

To cancel

- lift handset
- dial #*92

Intercom Call Back [#91]

- dial #91 when hearing busy.

To cancel

- lift handset
- dial #*91

Last Number Redial [#8]

- Lift handset
- dial #8

Message Waiting [#96]

- lift the handset
- dial #96ss (ss = station number)

To cancel a message left

- lift the handset
- dial #*96ss.

Paging - All Call Internal

- Lift handset
- dial #500

Paging - External Only

- Lift handset
- dial #501

Paging - System All Call

- Lift handset
- dial #502

Paging - Group (Zones)

- Lift handset
- dial #503g (g = Station Grp 1-8)

Paging - Meet Me Answer

- Lift handset
- dial #59.

Station Lock

- Lift handset
- dial #97pppp# (pppp = password).

Station Unlock

- Lift handset
- dial #97pppp* (pppp = password).

Station Lock Password Change

- Lift handset
- dial #97ppppnnnn (pppp = current password, nnnn = new password).

†Station Hot Line

- Lift handset
- dial ##4dx (d = delay (0-9), x = destination (#500, #501, #502, #503n, *1nn, *3n, *4n, 10-89))

†Station Hot Line Cancel

- Lift handset
- dial ##4

† Indicates feature only available in Feature Package 2