

Protegé[®] 616
Installation and
Maintenance
Manual

699066

Version 3.0

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Notice

This addendum reflects current Sprint Products Group standards, and its contents are subject to change without notice. While every effort has been made to avoid errors, Sprint Products Group disclaims liability for difficulties arising from interpretation of information contained herein.

Electro-Static Discharge Warning

Internal components of the Protegé 616 KSU and digital keysets are static sensitive. Handle expansion boards by the edges only and keep replacement components in their protective case until installation. Do not bend or touch component pins or subject them to static discharge. When working with an open 616 KSU or digital keyset, use an anti-static wrist strap and cover the work surface with anti-static material. Any static charge (no matter how small) must be discharged from the body before touching any internal components. The warranty for this equipment does not cover damage caused by static or mishandling. Modules or components damaged in such a manner will not be replaced.

Hazardous Voltage Warnings

The equipment owner is responsible for protecting the equipment from hazardous voltages.

The Protegé 616 system was submitted to a Nationally Recognized Testing Laboratory (NRTL), such as ETL, for safety approvals. Before installation, check your local electrical codes for installation of telephone and electronic equipment.

The following safety information is from UL 1459, Issue 2, a product safety specification governing telephone equipment.

Important Safety Instructions

When using your telephone equipment, the basic safety precautions described below should always be followed to reduce the risk of fire and electric shock.

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. DO NOT use liquid or aerosol cleaners.
4. Do not use this product near water (for example, in a wet basement).
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings in the KSU are provided

for ventilation to protect it from overheating. These openings must not be blocked or covered. The KSU should never be placed near or over a radiator or heat register. The KSU should not be installed in an enclosed cabinet unless proper ventilation is provided.

7. 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 local power company.
8. Do not allow anything to rest on the power cord. Do not locate this product where the cord may be damaged by persons walking on it.
9. Do not connect an extension cord to this product's power cord. The AC outlet used for the system should not be used for any other electrical equipment.
10. Do not push objects into this product through the cabinet grill. They may touch dangerous voltage points or short parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on this product.
11. To reduce risk of electric shock, do not disassemble this product. Take it to a qualified service technician when service or repair is required. Opening or removing covers may expose personnel to dangerous voltages or other risks. Incorrect re-assembly can cause electric shock when the product is subsequently used.
12. Unplug this product from the wall outlet and contact qualified service personnel for the following conditions:
 - a. When the power supply cord or plug is damaged or frayed.
 - b. If liquid has been spilled into the product.
 - c. If the product has been exposed to rain or water.
 - d. If the product does not operate normally; adjust only those controls covered by the operating instructions. Improper adjustment may cause damage and often requires extensive work by a qualified technician to restore normal operation.
 - e. If the product has been dropped or the cabinet has been damaged.
 - f. If the product exhibits a distinct change in performance.
13. Never use a telephone (other than a cordless phone) during an electrical storm.
14. Do not use the telephone to report a gas leak in the vicinity of the leak.
15. Never install telephone wiring during a lightning storm.

16. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
17. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
18. Use caution when installing or modifying telephone lines.

FCC REGULATIONS

Instructions to comply with FCC Regulations:

System Registration: In some states, the tariff laws concerning the connection of multi-telephone system require that the FCC number be reported to the telephone company to signify the type of installation. The Protégé system has two FCC regulation numbers for each KSU type corresponding with two modes of operation. Before contacting the telephone company to order telephone lines, determine the proper FCC number from the label on the KSU. The two operation modes are:

"MF" - Fully protected multi-function system,

"KF" - Fully protected key system.

The Protégé 616 System FCC Registration Numbers are:

MF = FTZTAI-35688-MF-E

KF = FTZTAI-35689-KF-E

Only report the "KF" number if lines can only be accessed singly by pressing line keys on the keysets. If any type of pooled access to Central Office lines is available (including LCR, line routes, or even the capability of dialing 9 to search for a free outside line) the "MF" number should be reported.

Notification Requirements: The Protégé 616 equipment is registered with the Federal Communications Commission under Part 68 Rules and Regulations for direct connection to the telephone network. Read and follow the instructions below to comply with FCC regulations.

Terminal Equipment or Protective Circuitry: This equipment complies with Part 68 of the FCC Rules and Regulations. The information containing the FCC Registration number and ringer equivalence number (REN) is located on the label of this equipment. If requested, this information must be provided to the telephone company.

The following information must be provided to

the telephone company, if requested.

USOC = RJ25C

Service Order Code = 9.0F

Facility Interface Code = O2LS2

REN: 1.5B

The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum REN for the area.

Notify the telephone company upon final disconnect of such equipment or circuitry from the particular line(s).

Systems Assembled with Individually Registered Terminal Equipment or Protective Circuitry: Notify the telephone company before connecting any system assembled with individually registered terminal equipment or protective circuitry to the telephone network. Supply the following information for each line:

1. Any information required for compatible operation of the equipment with telephone company communications facilities.
2. The FCC Registration Numbers for all equipment dedicated to the line.
3. The largest ringer equivalence that will be presented to the line.
4. A list of FCC Registration Numbers for all equipment to be used in the system.

Connection Guidelines: Follow the guidelines below when connecting Protégé components with the telephone network.

1. Install equipment as specified in this manual.
2. Do not use party lines or coin lines.
3. If trouble occurs, disconnect the registered equipment from the telephone lines to determine if the equipment is malfunctioning. If the equipment is malfunctioning, stop using it until the problem is corrected.
4. The telephone handsets supplied with this equipment are Hearing Aid Compatible (HAC).
5. When programming emergency numbers or making test calls to emergency numbers

remain on the line and briefly explain to the dispatcher the reason for the call. Program and test emergency numbers in off-peak hours during the early morning or late evening.

6. This equipment is capable of providing access to interstate operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Services Improvement Act of 1990 and Part 68 of the FCC Rules.

Canadian Rules

Special Notice

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Sprint Products Group repair facility. Any repairs or alterations made by the user to this equipment or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

LOAD NUMBER: The LOAD NUMBER (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirements that the sum of the load numbers of all devices does not exceed 100.

Certification Number: 2760 11075A

NOTICE

This digital apparatus does not exceed the Class A limits for radio noise emissions from the digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables auq appareils numeriques de Classe A radioelectrique dans le reglement sur le brouillage radioelectrique edits par le Ministere des Communications du Canada.

Repairs

If trouble is experienced with the Protegé 616 system, please contact Sprint Products Group at 1-800-791-1110 for repair, return authorization, or warranty information. A return authorization must be obtained from Sprint Products Group before any products may be returned to Sprint Products Group.

Toll Fraud

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.

Privacy

WHILE THIS DEVICE IS DESIGNED TO BE REASONABLY SECURE AGAINST INVASION OF PRIVACY, IT IS BY NO MEANS INVULNERABLE TO SUCH INVASIONS, THEREFORE NO EXPRESSED OR IMPLIED WARRANTY IS MADE AGAINST UNLAWFUL OR UNAUTHORIZED UTILIZATION WHICH RESULTS IN THE INVASION OF ONE'S RIGHT OF PRIVACY.

Music Copyright and Broadcast

Restrictions

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.

Limited Warranty

Sprint Products Group, Inc. provides original purchasers with a limited warranty against defects in material and workmanship on this product for two (2) years from date of purchase. This two (2) year limited warranty is extended only to original purchasers. This warranty does not apply to defects or malfunctions caused by abuse, accident, modification, negligence, or any other damage not resulting from defects in material or workmanship or for reasons beyond the control of Sprint Products Group, Inc.

THIS WARRANTY SPECIFICALLY EXCLUDES THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY IS IN LIEU OF AND EXCLUDES ANY CLAIMS BY THE PURCHASER FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES. Some states do not allow the exclusion of consequential or incidental damages, in which case the foregoing exclusion may not apply to you. This warranty gives you specific legal rights, and you may have other legal rights which vary from state to state. In accordance with the Federal Communications Commission regulations, repair of this equipment must be performed by Sprint Products Group, Inc. or an authorized agent.

ment on a billable basis based on the cost of labor and parts and return the equipment to you at your expense. Any equipment received that was not made by Sprint Products Group, Inc. will not be repaired and will be returned to you at your expense.

Servicing Instructions

Equipment requiring servicing should be returned to place of purchase, whenever possible. Otherwise, call 1-800-791-1110 to request a Material Return Authorization (MRA) number and obtain return instructions.

Sprint Products Group, Inc. assumes no responsibility for equipment received damaged due to improper packing or shipping. No responsibility is assumed for the repair and/or return of foreign attachments such as adapter plugs, extra length cords, etc.

If inspection by Sprint Products Group, Inc. determines the defective equipment to be covered by warranty, it will be repaired and returned to you at no cost.

Equipment received with damage due to abuse, inadequate packing, improper shipping or handling, or due to some other warranty noncompliance, will be repaired on a billable basis based on the cost of labor and parts. The equipment will be returned to you at your expense.

If this equipment is returned to Sprint Products Group, Inc. in a complete and undamaged condition after the two (2) year warranty period has expired, Sprint Products Group, Inc. will repair the equip-

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1 Introduction

The Protegé® 616 Installation and Maintenance Manual provides the information necessary to install, program, operate and maintain the Protegé digital, hybrid key system. Sprint Products Group, Inc. provides this document as a guide for telephone installers and service personnel.

The contents of this manual are subject to revision or change without notice.

It contains five chapters.

- 1) Introduction: an overview of the Protegé 616 system.
- 2) Specifications: detailed technical specifications and requirements.
- 3) Installation: a pre-install checklist and instructions required to install the system.
- 4) Features: descriptions of the 616 features.
- 5) Programming: instructions on programming the 616 systems.

1. 616 System Overview

The Protegé 616 is the newest addition to the Protegé key system family. It supports the 26 Button Business with Display and the 17 Button Business without Display digital keysets. It also works with an analog adapter that provides support for single-line telephones and other analog devices like fax machines and modems.

Protegé 616 comes ready-to-use with a default software configuration. The software can be customized to meet customer requirements from the Business with Display keyset.

1.2 616 Capacity

The 616 comes equipped with three lines and eight digital extension ports. The system can be expanded to a maximum capacity of 6 lines and 16 digital extensions by installation of an optional 3x8 expansion board. Each digital extension port can be modi-

fied with the use of an Analog Adapter to provide two analog ports. The maximum number of analog extension ports possible is 30.

2. Hardware Summary

A single self-enclosed cabinet houses most of the 616 system components. See Figure 1-1. The cabinet can be mounted on a wall. The cabinet comes fully equipped to support many small business applications such as external paging, music on hold, power failure transfer and voice mail integration.

2.1 3x8 Expansion Board

An optional 3x8 expansion board can be installed in the 616 KSU to expand the system capacity to 6 lines and 16 digital extensions. Material code 436052.

2.2 Optional Analog Adapter

A standalone analog adapter can be connected to a digital port. The adapter splits the "B" channels to connect up to two analog devices. Each analog adapter includes two DTMF receivers and two tone detectors. Material code 436370.

2.3 Station Instruments

The 616 system supports the 26 Button Business with Display and the 17 Button Business without Display digital keysets. A standard single line telephone can be used on the system with the use of the optional analog adapter. The single line phone does not support 90V DC message waiting.

2.4 Optional Peripheral Equipment

The system supports an external music source (for music-on-hold or background music) and external (single, one-way) paging equipment can be connected to the system.

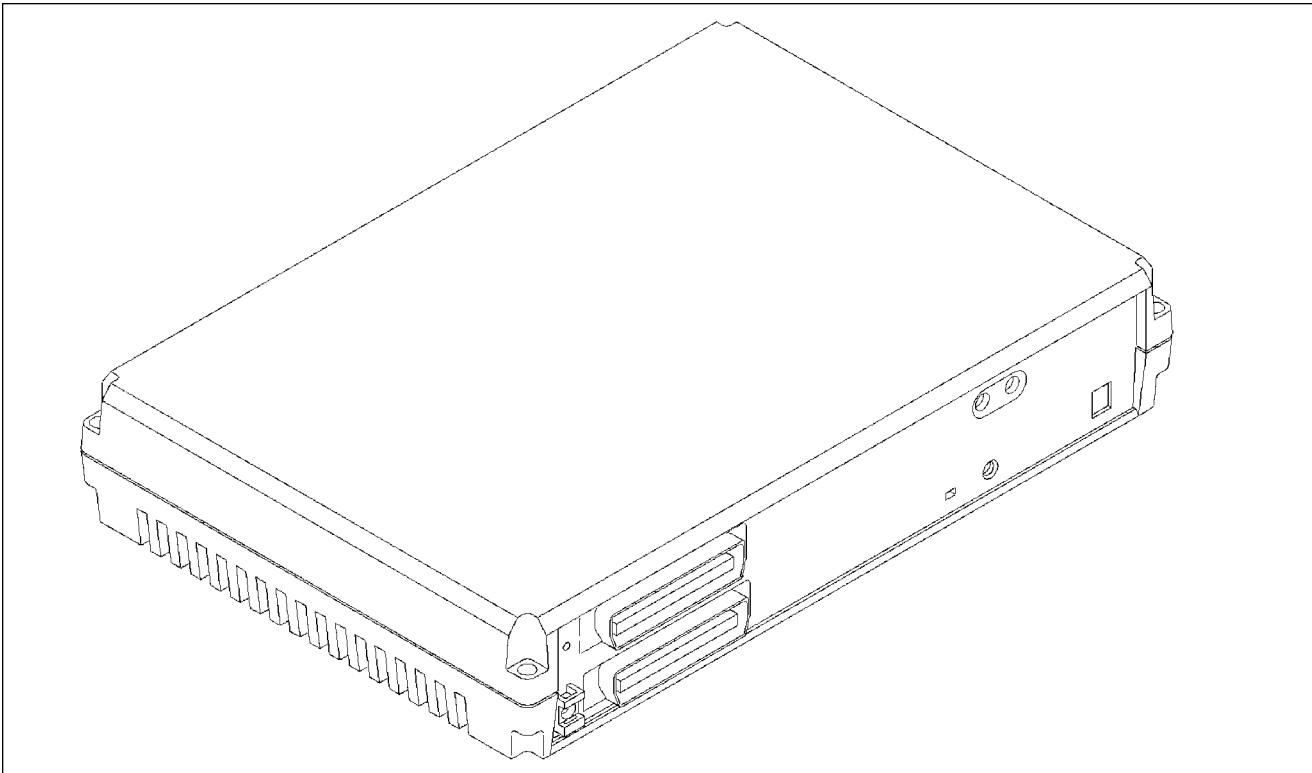


Figure 1 - 1: Protegé[®] 616 Key Service Unit (with optional 3x8 Expansion Board installed).

3. Software Summary

Protegé 616 systems are shipped ready for immediate use with a default software configuration. The default configuration can be modified or completely replaced to satisfy specific customer requirements. Protegé 616's database can be entered and changed, under password control, from any Business Display keyset.

Protegé digital keysets are shipped ready for immediate use with a default configuration. The keyset configuration can be altered through system programming or from individual stations.

3.1 Features Overview

The Protegé 616 feature set contains many features that are normally found on larger key systems. Some of these features include: call abandon, class of service, distinctive ring, power failure transfer, private line, toll restriction and many more. A complete listing of features can be found in chapter 4 "Features" of this manual.

4. Installation, Programming and Maintenance

4.1 Installation Summary

Installation of the Protegé 616 is straightforward. In-depth information can be found in chapter 3 "Installation," including step-by-step information on the installation process.

4.2 Programming Summary

The 616 comes ready for immediate use with a default software configuration. Additional programming can be accomplished through the use of a Business Display keyset.

4.3 Maintenance Summary

Protegé 616 requires no routine/scheduled maintenance. Peripheral equipment, such as battery backup units, may require routine maintenance. Check the instructions provided with the equipment for maintaining these items.

4.4 Keyset User Guides

A quick reference card and a user's guide are available for use with both models of the Protegé digital

keyset, and the single line telephone. The cards and user guides can be ordered separately.

4.5 Liability Disclaimer

This manual reflects current Sprint Products Group standards. Its contents are subject to change without notice. While every effort has been made to avoid errors, Sprint Products Group disclaims any liability arising from errors or misinterpretations of information contained herein.

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2 Specifications

This chapter provides hardware specifications for the Protegé[®] 616 digital hybrid key telephone system and related components. An overview of the specifics of the 616 software is provided in chapter 4, "Features," and chapter 5, "Programming." Steps for installing the 616 system are provided in chapter 3, "Installation," of this manual.

Every effort has been made to ensure that the information in this chapter is accurate and comprehensive. However, Sprint Products Group disclaims liability for difficulties ensuing from interpretation of the information contained herein. Furthermore, SPG

disclaims liability for any configuration or utilization not specifically provided in this manual and shall have no liability for the product in the event of unauthorized modifications.

1. System Resource Capacity

Table 2 - 1 offers a listing of the system resource capacities for such resources as Speed Dial numbers, conferencing, and pre-programmed messages.

616 System Resource Capacity	
Resource	Capacity
Conference	8, 4-party
Individual Speed Dial Numbers	20 numbers (00 - 19)
System Speed Dial Numbers	80 total (20 - 99)
Toll Restriction Table	100 sets
Extension Group	4 groups (1 - 4)
Line Group	2 groups (1 - 2)
Distinctive Ringing Station	4 types 640, 480 Hz interchanges every 40 ms 480, 384 Hz interchanges every 40 ms 384, 320 Hz interchanges every 40 ms 320, 274.3 Hz interchanges every 40 ms
Station Classes of Service	8 (0 - 7)
Music on Hold	1 external music source
Pre-programmed Messages	7 total 6 system programmable 1 individual programmable
Message Waiting Buffer	96 messages

Table 2-1: 616 System Resource Capacities. The table shows the maximum capacity for each of the listed resources.

2. Cabling and MDF

Cabling and wiring used for the 616 system should meet or exceed the following specifications.

2.1 Wiring Overview

Connections between CO lines, station instruments, external equipment and the 616 board are made at the Main Distribution Frame (MDF). See Figure 2-1.

For standard telephony wiring, the MDF usually consists of a 3/4" wood backboard mounted on a wall in the utility closet where the system switching components will be installed. One standard 66M1-50 type terminal block is attached to the backboard for the actual wire connections.

2.2 Station Wiring

Protegé station equipment requires unshielded, twisted pair (UTP) 24-gauge cable. Each station uses only one wire pair. For convenience in terminating, however, two pair is recommended. The second pair can be used as a backup connection if the first pair is damaged. All unused pairs should be grounded at the MDF.

The station cable runs must not exceed the lengths listed in Table 2-2: Maximum Loop Distance and Cable Resistance.

2.3 Interface Cable

The Protegé 616 KSU and 3x8 expansion board each require one 25-pair amphenol-type (male-ended) interface cable for terminating the CO lines and digital extensions. This cable may be purchased in a 2-3 foot length with a 66M1-50 block already terminated. Alternatively, the cable can be prepared on site. Instructions on preparing this cable are not included in this manual.

2.4 Grounding Cables

Sprint Products Group highly recommends grounding all unused cable pairs at the MDF to an earth ground point.

2.5 Station Modular Jacks

Terminate station cable runs on modular jacks mounted near where the station instrument will be placed. Each station requires a 1-pair connection.

Maximum Loop Distance and Cable Resistance

Type of Extension	Loop Distance	Cable Resistance
Digital	1312 ft (400m)	70 ohms
Analog	1312 ft (400m)	70 ohms

Table 2 - 2: Maximum Loop Distance and Cable Resistance

2.6 Terminal Block

Use one 66M1-50 style terminal block to terminate the KSU interface cable for station and line connections. Terminate the KSU interface cable on the right side of the block. Terminate the station and line cables on the left side of the block. Each line and station cable requires a two-wire connection. Use bridging clips to complete the connection after the terminal block has been punched down.

Important: Make sure that the system power is off while making terminal block connections. Shorting punch block terminals together can damage the KSU.

2.7 Phono Jack Connections

The KSU has two mono, 1/8" mini-phono jacks. These can be used for external music source and external paging. The music source's optimum input level is 0 dB, 600 ohm input impedance. The external paging source's optimum output level is 0 dB, 600 ohm output impedance.

3. Equipment Cabinet

3.1 Protegé 616 KSU

The 616 Key Service Unit (KSU) houses the main Printed Circuit Board and Central Control Board. The main printed circuit board provides interface for three loop-start CO lines and eight key telephones. The Central Control Board performs all the control functions including digital voice and data communications.

The design of the KSU includes a conductive paint on the inside cover that acts as a ground path to the ground lug connection on the side of the KSU. Protection from over-current is provided by a fuse, which is rated 5A, in the power transformer.

3.2 Protegé 616 Power Supply

A power adapter is included with the KSU. It provides electrical power to the internal components of the KSU and to all station instruments except analog adapters. Power is applied or removed from the unit by plugging and unplugging the AC adapter from the AC outlet. Connect the adapter cord to the KSU before the AC adapter is plugged into the AC outlet.

4. Internal Components

4.1 3x8 Interface Board & 3x8 Expansion Board

The main PCB (also known as Motherboard) consists of the following circuits:

616 Cabinet Characteristics

Cabinet Dimensions	
Height	12.9 in. (330 mm)
Width	8.8 in. (224.5 mm)
Depth	2.8 in. (71.5 mm)
Cabinet Weight	
616 KSU	3.36 lb. (1.53 kg)
Electrical Characteristics	
Input	120VAC, 60Hz (20-36VDC)
Output	24 VDC. 1 Amp
Power Consumption	54 Watts

Table 2 - 3: 616 Cabinet Characteristics.

- Eight digital extension interface circuits
- Three loop-start CO lines
- Lightning surge protection
- Ring detection
- Polarity guard
- Loop relay and associated snubber circuit
- Darlington electronic choke
- Radio frequency noise filter
- Coupling/isolation transformer, impedance 600:600
- Voice signal limiter with Zener diodes
- Hybrid circuit with complex impedance
- Balance network
- COMBO circuit for analog to digital interface
- Caller ID detection circuitry

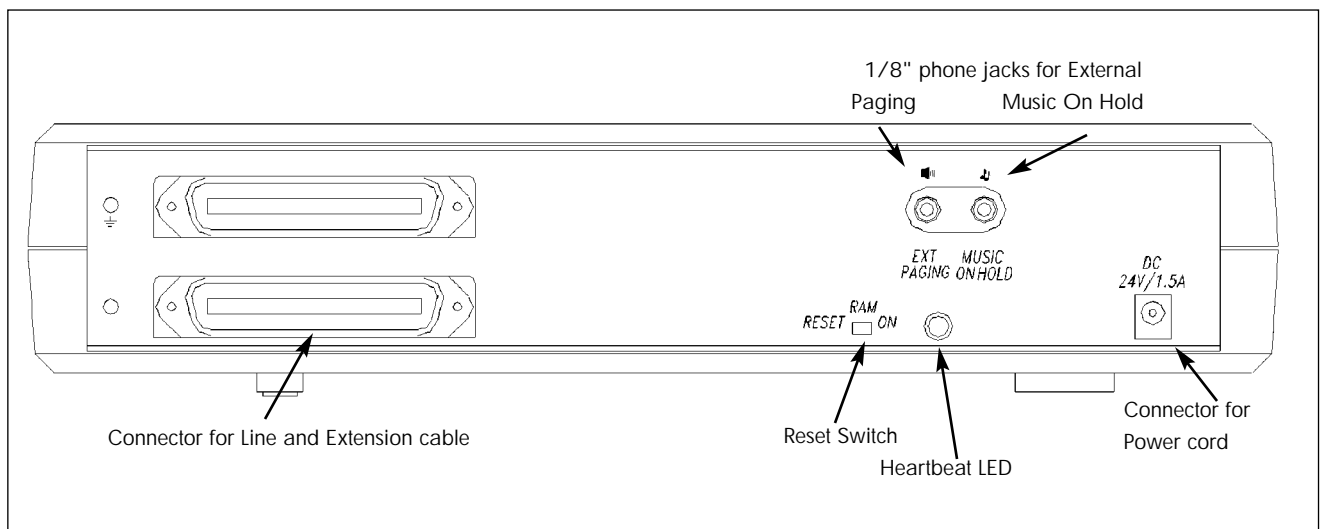


Figure 2 - 1: Side View of Protegé[®] 616 Key Service Unit with the optional 3x8 Expansion Board installed showing connectors

4.2 Central Control Board

This board contains all circuitry to control the fully equipped KSU. There is an internal connector between the main PCB and the Central Control Board. The Central Control Board contains:

- An 8088-compatible 16-bit microprocessor
- 512 Kbyte ROM chip containing system software
- 128 Kbyte CMOS RAM with battery backup
- Interrupt controller
- Time slot interchange circuit
- Digital conference circuit
- System heartbeat indicating red LED
- System timing circuit and PCM frame timing circuit
- CPU/RAM reset switch for initialization

4.3 Auxiliary Board

This board contains circuitry for connecting to external input and output devices (music source and paging equipment).

5. Optional System Components

5.1 3x8 Expansion Board

One 3x8 Expansion Board may be installed in the 3x8 KSU to expand the system to a maximum capacity of 6 lines and 16 digital extensions.

5.2 Analog Adapter

Analog Adapters can be connected to any of the digital station ports.

5.3 Station Instruments

Protegé® 616 supports the Business with Display and Business without Display keysets. Additionally the 616 system works with single-line phones, fax machines and voice mail systems that must be connected to the 616 KSU via an analog adapter.

6. Optional Equipment

6.1 Music on Hold/Background Music

Radios, CD players, tape players and other audio sources can be connected to the external music port

on the KSU. The external source is mono and the impedance must be 600 ohms to match the input impedance of the external music port.

Note: Broadcast music sources are subject to copyright restriction.

6.2 Voice Mail

Commercial voice mail systems can be attached to an analog adapter port. The interface requirements for a voice mail system are the same as those for an industry standard single line phone.

6.3 Fax

Commercial fax equipment can be attached to an analog adapter port. The interface requirements of a fax system are the same as those for an industry standard single line phone.

6.4 External Paging

The 616 KSU provides a single paging port. It has an output impedance of 600 ohms. If an external paging unit is connected to a Protegé® system, its input impedance also should be 600 ohms to match. Matching impedances ensures maximum output from the pager and noise free operation. The page port output is 0 dBm.

6.5 Power Failure Transfer

Power failure transfer provides a bypass for outside line calls during power failure with no backup batteries or after the backup batteries have been depleted. This is a hardwired feature. The system automatically switches the first line to an optional dedicated analog telephone connected to the 66M1-50 block. During Power Failure Transfer, incoming calls on line 1 only ring at this analog phone. The phone also may be used to place outgoing calls for assistance.

7. Station Instruments

The Business with Display and Business without Display digital keysets are available for use on the Protegé 616. These models make the extensive collection of features easier to use. In addition to the two keysets, Protegé 616 works with single line phones and other analog devices such as fax machines, modems and voice mail systems that must be connected via an analog adapter.

7.1 Common Keypad Features

The two keysets share a common set of basic features. These include a reversible baseplate for desk-top or wall-mounting use, eight levels of voice and ringer volume control, single-pair wire installation, 10-foot coiled handset cord, dual colored LEDs, headset compatibility, speakerphone, programmable feature keys and seven fixed keys for the most user features:

Hold - places calls on hold

XFR/CONF - transfers calls or establishes a conference call

Clear - disconnects call or exits programming

Function - accesses system features

Vol (up) - increases voice/ring volume

Vol (down) - decreases voice/ring volume

Speaker - activates the built-in speakerphone

In addition to the above seven keys, each keypad includes a "Redial" key that can be reprogrammed for another system feature if desired.

Each keypad also includes programmable function feature keys. These keys can be programmed with functions such as Do Not Disturb, Call Forwarding or dialing a directory number to access other extensions.

7.2 Business Keypad with Display

The Business 15DCL Keypad with Display is a 26 button phone that has 16 programmable feature keys, 15 of which have dual color LEDs. The Business with Display has a dedicated headset jack and includes an LCD panel that has three interactive function keys (F1, F2 and F3) for feature selection and programming.

7.3 Business Keypad

The Business Keypad is a 17-button phone that has nine feature keys with dual color LEDs. The Business Keypad is the basic Protégé station instrument.

15DCL Keypad with Display

Feature Key Number	Content	Detail
1	1	Co Line
2	2	Co Line
3	3	Co Line
4	10	Extension
5	11	Extension
6	12	Extension
7	13	Extension
8	14	Extension
9	15	Extension
10	ICM	Intercom Key
11	F98	Voice Call Allow
2	F2	Call Forward
13	F502	All Page
14	F4	Do Not Disturb
15	F76	Mute

Table 2 - 4: Business with Display Keypad

9DCL Keypad without Display

Feature Key Number	Content	Detail
1	1	Co Line
2	2	Co Line
3	3	Co Line
4	10	Extension
5	11	Extension
6	ICM	Intercom Key
7	F22	Direct Call Forward
8	F4	Do Not Disturb
9	F76	Mute

Table 2 - 5: Business without Display Keypad

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3 Installation

This chapter explains how to install the Protegé® 616 digital hybrid key system. It includes detailed installation steps specific to the Protegé system. Installers should know standard telephony and data wiring techniques. This manual does not give detailed steps for standard techniques.

1. Installation Overview

1.1 Installation Steps

The following list briefly describes each step in the installation process. The steps are listed in the recommended order of completion.

- 1) Read the Installation Chapter. Installers should read this chapter before installing the system.
- 2) Site Planning. The position of the Protegé system components should be determined before the installation begins. A floor plan showing station positions and cabling should be developed.
- 3) Install the MDF. The Main Distribution Frame is usually a 3/4 inch wooden backboard, mounted on a wall. Attach the punch down terminal block onto the backboard. Station wiring and CO lines are connected at the MDF.
- 4) Install Programming Software. Before mounting the KSU on the MDF backboard, remove the four screws that hold the front panel in place. Install the software.
- 5) Install KSU. Mount the KSU on the MDF backboard. Use the provided mounting template to aid in spacing the mounting screws.
- 6) Attach Interface Cables. The 616 KSU is connected to the 66M1-50 terminal block on the MDF.
- 7) Station Cabling. Each Protegé station requires one twisted-pair, 24 AWG connection. The use

of two twisted-pair, 24 AWG wire is recommended. Station cabling is terminated on the 66M1-50 block at the MDF and four conductor modular jacks at the station.

- 8) CO Line Cabling. Terminate the CO lines on the 66M1-50 block at the MDF.
- 9) Install Station Equipment. Protegé digital keysets and analog devices require basic assembly and connection.
- 10) Install Optional System Equipment. Optional system equipment might include music on hold devices or external paging equipment.
- 11) System Initialization. Change the RAM slide switch from the factory default RESET to ON. Once this has been done and all components have been set up and all connections have been made, the Protegé system can be initialized. The system boots up with default programming that can be changed to suit individual customer requirements. Programming information is found in chapter 5, "Programming."

1.2 Preliminary Checklist

To make installation easier, the following items should be checked before beginning the 616 installation.

1.3 Location

At most sites the Key Service Unit (KSU) or Main Distribution Frame (MDF) will be installed in a utility closet or similar isolated space. Wherever the KSU and MDF are installed, they must not be exposed to direct sunlight, high humidity, heat, dust, strong magnetic fields (such as those generated by electrical motors and copy machines), or Radio Frequency Interference (RFI) fields (such as those generated by radio or television broadcasting equipment). The location chosen should be centrally located to simplify wiring. Be sure that no station wiring exceeds the maximum length listed in the Maximum

Loop Distance and Cable Resistance Table 3-3 on page 3-6. The table assumes the use of twisted pair 24 AWG wire.

1.4 Power Requirements

The KSU cabinet must be within 5 feet (1.5 meters) of the isolated, dedicated, 105 - 125VAC, 57 - 63Hz, 15A, single-phase commercial power receptacle. No other equipment may be connected to the dedicated circuit.

A surge protector should be used to protect the KSU from power surges and voltage spikes.

1.5 Environmental Conditions

As a general rule, if environmental conditions are suitable for office personnel, they also are suitable for Protegé equipment. The KSU may be safely operated in temperatures ranging from 32° to 104° Fahrenheit (0° to 40° Celsius), in relative humidity ranging from 5% to 95% (non-condensing), and at altitudes up to 10,000 feet. Ensure that these conditions will not be exceeded under any circumstances (such as air conditioning failure and tropical depressions). A properly controlled environment will extend equipment life and help ensure reliable system operation.

1.6 Installation Safety Guidelines

(From UL 1459, a product safety specification for telephone equipment.)

- 1) Never install telephone wiring during a lightning storm.
- 2) Never install telephone jacks in wet locations unless the jack is designed for use in wet locations.
- 3) Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- 4) Use caution when installing or modifying telephone lines.

1.7 Tools and Supplies

A basic list of tools and supplies required to install the Protegé® 616 system is provided in the Tools and Supplies Table. The list is intended for standard telephony wiring practice. Sites requiring EIA/TIA568A unshielded, twisted pair wiring standards require additional components.

1.8 Install MDF

The Main Distribution Frame (MDF) is where the KSU, the station equipment and CO lines are

Environmental Conditions

Requirements	In Operation	In Storage
Temperature - KSU and Keysets	32° - 104° F (0° - 40° C)	-40° - 185° F (-40° - 85° C)
Relative Humidity (non-condensing)	5% - 95%	5% - 95%
Altitude	10,000 feet	10,000 feet

Table 3 - 1: Environmental Conditions

Tools and Supplies

Qty	Description
1	Protegé® Business Display keyset for programming
1 pair	Side-cutter pliers
1 pair	Needle-nose pliers
1	Cable cutter
1 set	Common screwdrivers
1 set	Phillips-head screwdriver
1	Punch-down tool
1	Phone test set
1	High-impedance, Digital VOM, at least 0.5% accuracy
1	Grounding wrist strap
1 pair	Safety glasses
1 pair	Gloves
1	66M1-50 type terminal blocks
Varies	Bridging clips
Varies	2 Twisted-pair 24 AWG cable
Varies	4-conductor modular jacks
Varies	Stranded #10 AWG or larger, copper ground wire
1	Amphenol interface connector
1	1/2 inch wooden backboard for MDF
Varies	Mounting hardware for backboard
Varies	Equipment for mounting MDF: drill, stud finder, tape measure, etc.
Varies	Equipment for running station cables: cable puller, drop-lights, drill, etc.

Table 3 - 2: Tools and Supplies. This table provides a basic list of tools and supplies for installing the 616 system with basic telephony wiring practices.

connected. Usually, the MDF is 3/4 inch wooden backboard securely mounted to a wall in the utility closet or other isolated space where the switching equipment is to be installed.

To mount the MDF on a wall, be sure to obtain a backboard large enough to accommodate the 66M1-50 terminal block, the KSU and any optional equipment that must be close to the KSU or MDF. The recommended material for backboards is A/C plywood.

Attach the backboard securely to the wall with pan or hex head screws appropriate to the wall construction (wood screws for wood studs, self-tapping sheet metal screws for metal studs). Use screws not less than 3.5 inches in length. Insert washers on the screws to reinforce the backboard. Center backboard mounting screws on wall studs, use drywall or other substrate anchors and increase the number of screws used to attached the backboard.

Attach the 66M1-50 terminal block to the backboard for terminating station wiring, CO lines and KSU connector.

For details on 66M1-50 block connections see "Station Cabling" in this chapter.

2. Installation

2.1 Unpack and Inspect Cabinet

- 1) Remove the KSU cabinet from its packaging and place on a level surface.
- 2) Inspect the cabinet for any damage that might have occurred in shipping and for loose or missing components.

Warning: Printed circuit boards can be damaged by static discharge. Take precautions to protect the KSU during handling.

The preferred static protection device is a grounded wrist strap worn at all times while handling the KSU. For maximum effectiveness, make sure that the cabinet is grounded properly.

Avoid touching the electrical contacts on the boards. A static discharge on the Central Control Board may reset the 616 system.

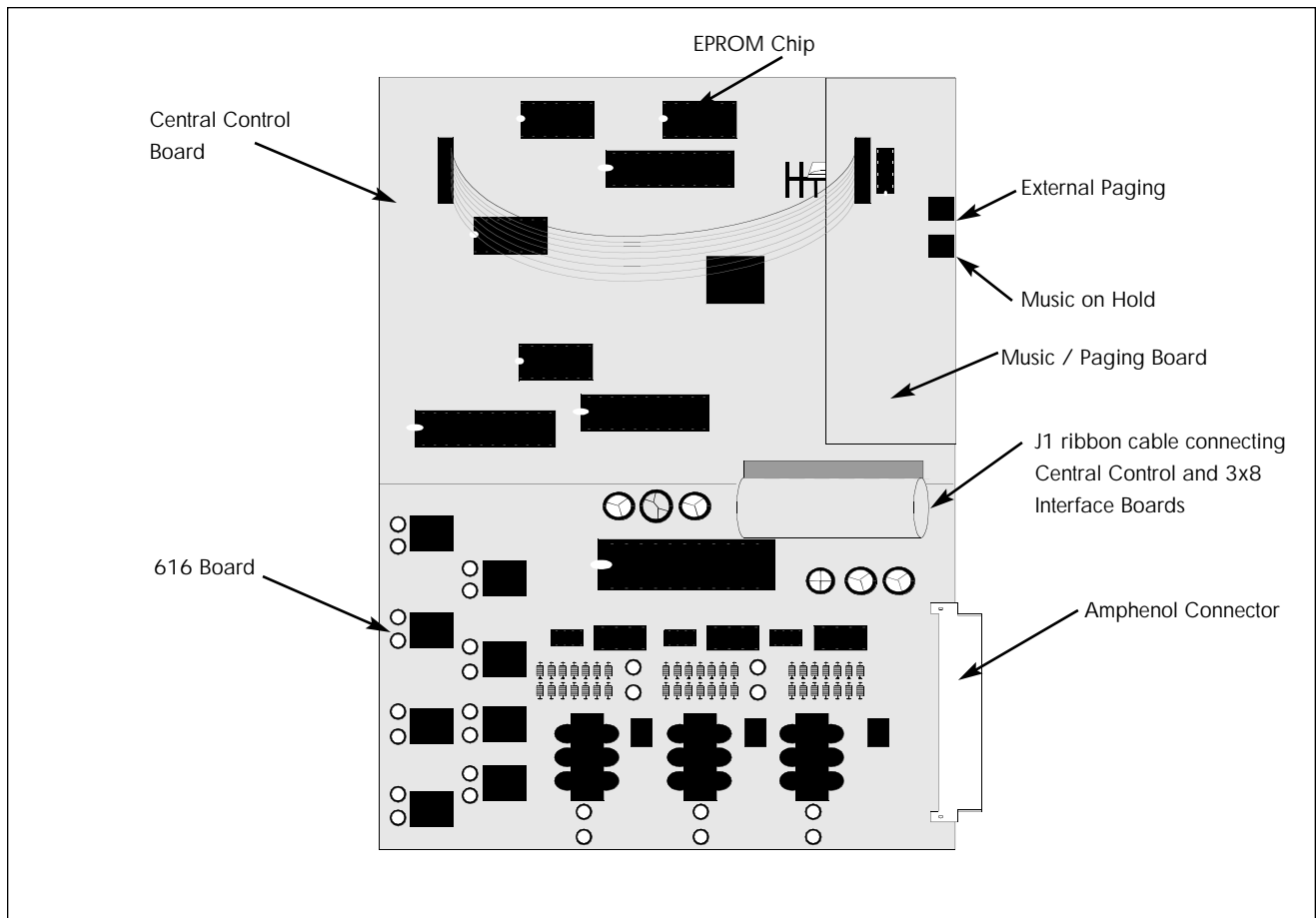


Figure 3 - 1: Protegé® 616 Key Service Unit Central Control, Paging and 3x8 interface boards.

2.2 EPROM Installation

The Protegé® 616 software consists of one EPROM that must be mounted in the IC socket on the Central Control Board. Follow the steps below to mount it:

- 1) Connect the grounding wrist strap to an approved ground.
- 2) Find the anti-static bag containing the EPROM chip for the CCB.
- 3) Place an anti-static bag on a level surface, and, observing static discharge precautions, place the KSU on the bag.
- 4) Being careful not to touch the chip pins, remove the EPROM from its carrier.
- 5) Insert the EPROM in its socket. Align the notch on the chip with the notch on the socket. Make sure that all pins are properly seated.
- 6) Replace the KSU cover and the four screws that hold it in place.
- 7) Move the RAM switch from On to Reset. Wait 10 seconds and return the switch to the On position.
- 8) Follow the mounting and power connection directions below.

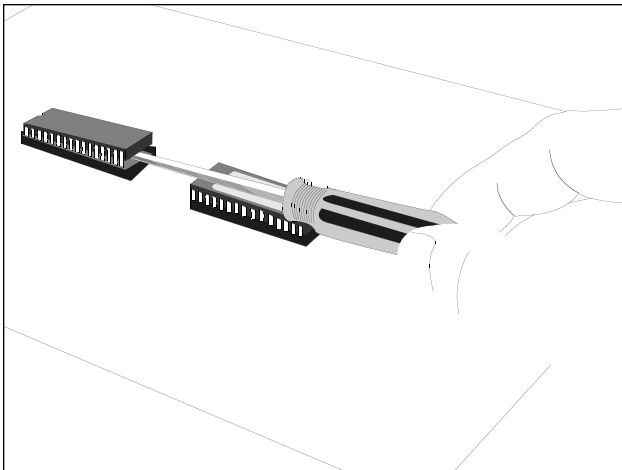


Figure 3 - 3: To upgrade the system software the U9 EPROM is removed and replaced on the Common Control Board of the Protegé 616 KSU.

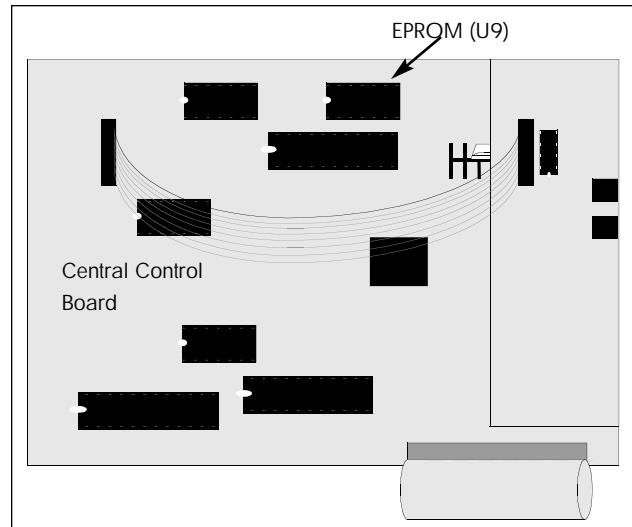


Figure 3 - 2: The Common Control Board of the Protegé 616 KSU.

2.3 Install Expansion Board

Some installations may require the optional 3x8 Expansion Board. Follow these steps to install the 3x8 Expansion Board in the KSU.

- 1) Connect the grounding wrist strap to an approved ground.
- 2) Remove the 3x8 Expansion Board and stand-offs (mounting posts) from the anti-static bag.
- 3) Remove the three mounting screws from the installed 3x8 Interface Board and replace with the standoffs. (Do not overtighten.)
- 4) Remove the two screws retaining the KSU side panel insert and carefully remove the insert.
- 5) Align the 3x8 Expansion Board over the stand-offs with the amphenol connector facing the opening in the KSU side panel.
- 6) Carefully place the 616 Expansion Board on the standoffs and secure with the screws removed in step 3.
- 7) Connect the ribbon cable from the 3x8 Expansion Board to connector JP3 on the KSU main PCB.
- 8) Replace the KSU cover and secure with the four cover screws.

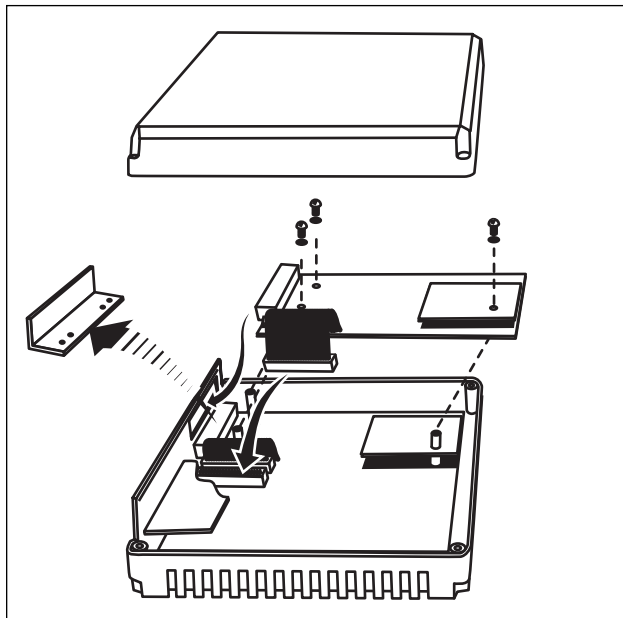


Figure 3 - 4: Installing the 3x8 Expansion Board in the KSU.

2.4 Install KSU

The KSU can be mounted on a wall by attaching it to the 3/4 inch wooden backboard used for the MDF. See the section on "Install MDF" discussed previously. Follow these steps to mount the 616 KSU.

- 1) Unfold the mounting template and place it on the backboard. The template can be taped on the backboard for positioning.
- 2) Mark the location of the two mounting screws on the template.
- 3) Remove the template and drill pilot holes for the mounting screws.
- 4) Screw the hex head screws into the two pilot holes for the mounting screws. Leave a 3/4 inch gap between the screw head and the backboard.
- 5) Position the KSU so that the keyhole slots in the mounting brackets are aligned over the mounting screws. Press the cabinet in place and lower to engage the brackets.
- 6) Once the KSU is on the MDF, pull the KSU cabinet gently outward to ensure that there is not too much space between the KSU backing plate and the MDF. If there is, remove the KSU, tighten the mounting screws a little and replace the KSU. Repeat step 6.

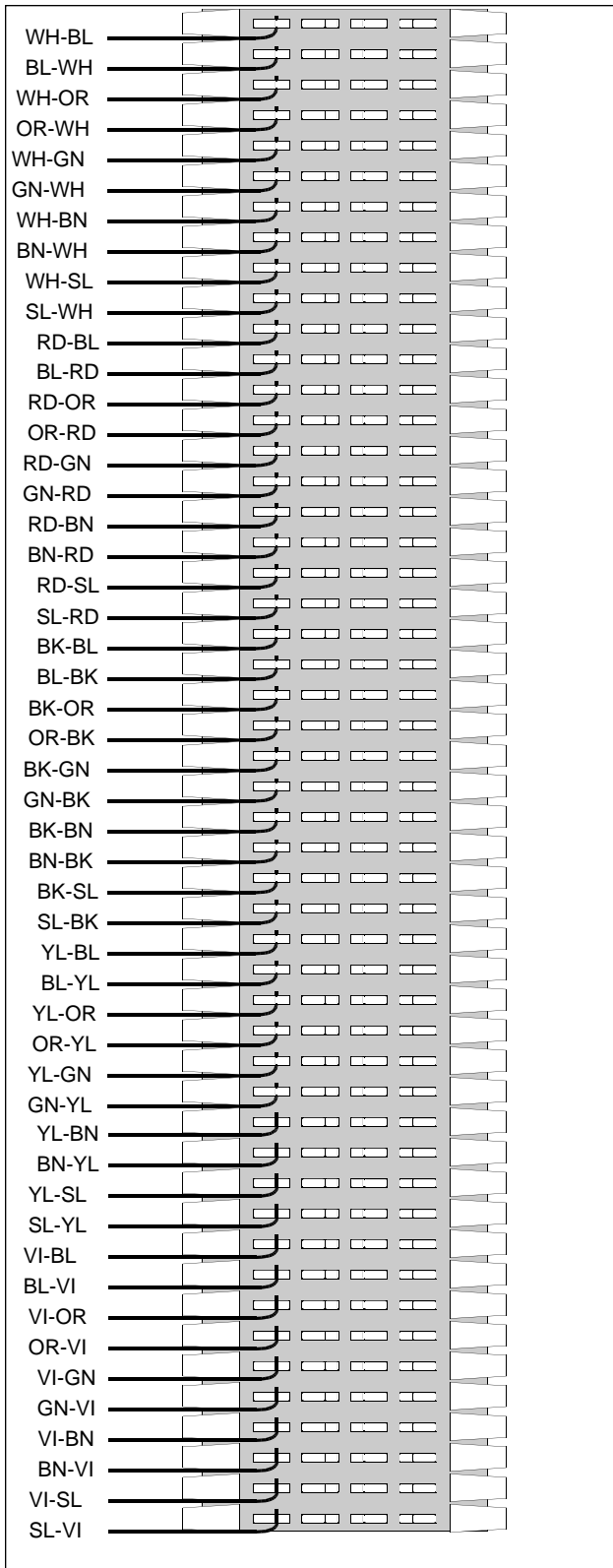


Figure 3 - 5: Cable to Terminal Block Connection. 66M1-50 style punch blocks are recommended for cable connections at the Main Distribution Frame.

2.5 Power Connections

The KSU cabinet must be connected to a dedicated AC power receptacle as described in "Power Requirements" in this chapter. Power is applied or removed from the unit by plugging and unplugging the AC adapter from the AC outlet. Connect the adapter cord to the KSU before the AC adapter is plugged into the AC outlet.

Maximum Loop Distance and Cable Resistance

Type of Extension	Loop Distance	Cable Resistance
Digital	1312 ft (400m)	70 ohms
Analog	1312 ft (400m)	70 ohms

Table 3 - 3: Maximum Loop Distance and Cable Resistance

Amphenol Connector Pin-Out Designation

Cable Pair	Pair Color	Designation
26/1	White/Blue	Station Port 1
27/2	White/Orange	Station Port 2
28/3	White/Green	Station Port 3
29/4	White/Brown	Station Port 4
30/5	White/Slate	Station Port 5
31/6	Red/Blue	Station Port 6
32/7	Red/Orange	Station Port 7
33/8	Red/Green	Station Port 8
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	N/C
44/19	Yellow/Brown	N/C
45/20	Yellow/Slate	N/C
46/21	Violet/Blue	N/C
47/22	Violet/Orange	CO1
48/23	Violet/Green	CO2
49/24	Violet/Brown	CO3
50/25	Violet/Slate	Power Failure CO1

Table 3 - 4a: Pin-Out. This table provides the pin-out designation for the first amphenol connector.

Amphenol Connector Pin-Out Designation

Cable Pair	Pair Color	Designation
26/1	White/Blue	Station Port 9
27/2	White/Orange	Station Port 10
28/3	White/Green	Station Port 11
29/4	White/Brown	Station Port 12
30/5	White/Slate	Station Port 13
31/6	Red/Blue	Station Port 14
32/7	Red/Orange	Station Port 15
33/8	Red/Green	Station Port 16
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	N/C
44/19	Yellow/Brown	N/C
45/20	Yellow/Slate	N/C
46/21	Violet/Blue	N/C
47/22	Violet/Orange	CO4
48/23	Violet/Green	CO5
49/24	Violet/Brown	CO6
50/25	Violet/Slate	Power Failure CO4

Table 3 - 4b: Pin-Out. This table provides the pin-out designation for the second amphenol connector.

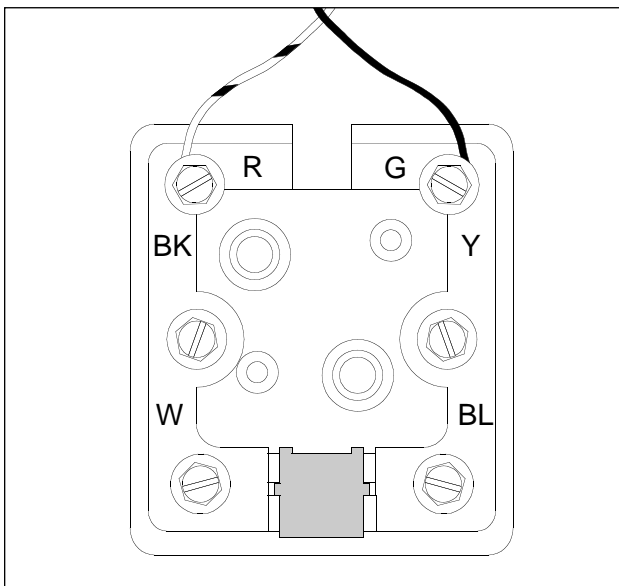


Figure 3 - 6: Modular Jack connections for Protégé station.

2.6 Attach KSU Cables

The 616 requires one 24-pair connectorized cable (available from Sprint North Supply) for terminating the 3 CO lines and 8 extensions.

To connect the cable, follow these steps:

- 1) Attach the amphenol-type connector on one end of the cable to the connector on the 616 KSU.
- 2) Strip the opposite end of the cable, exposing a sufficient amount of wiring for connection to the terminal block.
- 3) Follow the color code illustrated in Figure 3-4 to connect the cable to the terminal block.

2.7 Station Cabling

Protégé[®] stations require a star (home run) configuration from the KSU. Develop a floor plan before running cable to avoid problems such as overlooking or duplicating cable runs. Label both ends of each cable for easy identification.

Protégé stations require 24 AWG twisted-pair cabling. Each station uses one twisted pair. At least two-pair twisted cable is recommended for all stations. The additional pair may be used to replace a bad wire pair. Each station cable should be dedicated to one telephone instrument. Sharing one cable between two instruments is not recommended.

2.8 Running Station Cable

From the MDF, run standard 24 AWG two-pair twisted cable (4 conductor) to each station position. Follow these guidelines:

- 1) Install proper type cable for the application according to the National Electrical Code and local building codes.
- 2) 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.
- 3) Do not run station cables inside electrical conduit already occupied by AC power cable. (To do so is a violation of the National Electrical Code).
- 4) Do not run 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.
- 5) Do not place station cables where they can be stepped on or where they can be rolled over by office furniture.
- 6) Avoid using multi-pair (e.g. 25-pair) cable runs to multiple station locations. If multi-pair "feeder" cables are used, do not include AC-ringing single-line sets, AC-ringing auxiliary equipment, or CO lines in a cable used for digital keysets.
- 7) Do not exceed the loop limit measurement (using 24 AWG wire) for the station cable-lengths as outlined in Table 3-3.

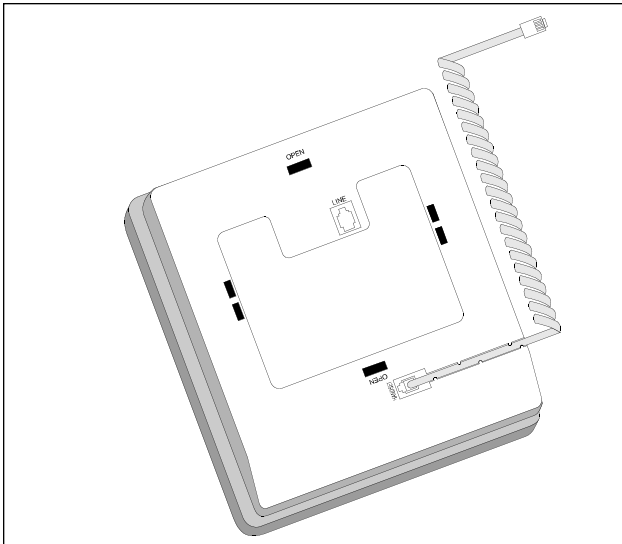


Figure 3 - 7: Press the first two inches of the handset cord into the notched strain relief channel.

2.9 Terminating Station Cable

Station Locations: Terminate each station with a four-conductor modular jack. Connect the white/blue wire to the green terminal and the blue/white wire to the red terminal of the jack. Note: polarity is not significant for Protegé® stations, but it is a good idea to follow standard telephony wiring practice (i.e., use white/blue for Tip and blue/white for Ring). See Figure 3-5.

Main Distribution Frame: Terminate the station cables on the 66M1-50 terminal block(s) at the MDF. Refer to Table 3-4 to determine the position of each station cable. Do not attach bridging clips until the loop resistance tests have been performed.

2.10 Station Loop Resistance Test

Perform the loop resistance test for each station. To perform the test, follow these steps:

- 1) Make sure that the bridging clips have not been installed on the 66M1-50 terminal block and that the station instruments have not been connected to the modular jacks.
- 2) Place a short across the red and green wires on the modular jack.
- 3) At the MDF, measure the resistance across the terminal posts to which the station cable is connected. The reading should not exceed the limits for 24 AWG wire listed in Table 3-3. Ohm values are the loop measurements; feet/meter values are the maximum one-way measurements from the KSU cabinet.
- 4) Remove the short after the test is complete.

Note: Excessive and/or improperly made connections increase the resistance of a cable, which reduces the allowable cable run length.

Repeat this test for each station cable. Install

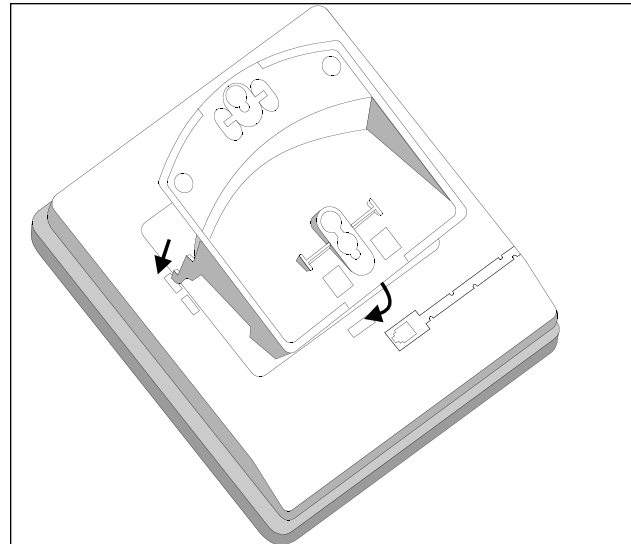


Figure 3 - 8: For a desk mount, turn the baseplate upside down and insert the baseplate hooks into the upper slots in the keyset. The raised end of the baseplate should face the line jack.

bridging clips on the station blocks to complete the cable resistance.

2.11 CO Line Connections

Central Office lines are routed from the telephone company demarcation block to the 66M1-50 terminal block. Use the CO Line Termination Table 3-5 to identify the pairs associated with each CO line.

CO Line Termination		
Main 616 Board Line	3x8 Exp. Board Line	Pair Color
1	4	Violet/Orange
2	5	Violet/Green
3	6	Violet/Brown

Table 3 - 5: C.O. Line Termination

2.12 Power Failure Transfer

In case of a power failure, Protegé automatically switches to the battery backup system for continued operation. Operation on battery backup power supply is identical to normal operation.

If the battery backup becomes depleted, or if no battery backup system has been connected, Protegé automatically switches to "power failure transfer" operation.

The Line 1 circuit and Line 4, if equipped, is automatically switched to a designated emergency telephone connected to the Violet/Slate pair of the 66M1-50 terminal block. All incoming calls on Line 1 will ring at a single-line telephone and outgoing calls can be placed from this telephone. Other call processing features like transfer, conferencing and digital keyset operation are not supported in the Power Failure Transfer mode.

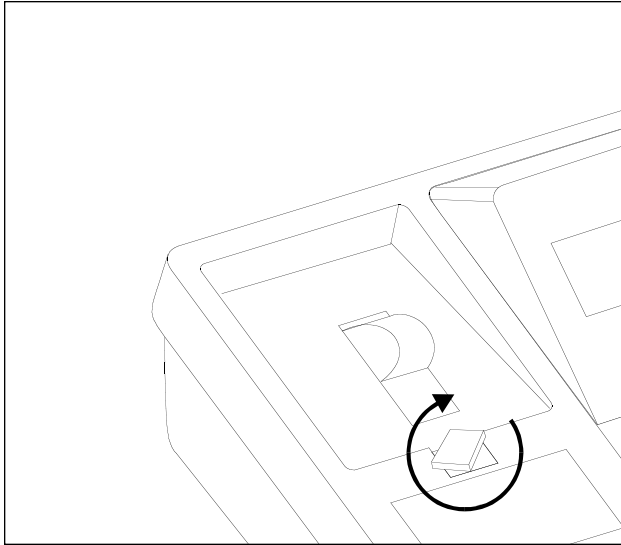


Figure 3 - 9: For a wall mount, lift the cradle tab and rotate it 180° until it clicks into the keyset. Changing the cradle tab orientation holds the handset in position.

3. Install Protec  Digital Keysets

Unpack each unit. A complete installation uses all of the items on the packing list. Report missing or damaged items to Sprint Products Group for replacement or credit.

3.1 Insert Overlay and Directory Card

- 1) Write the extension number on the line/feature key overlay. Place the overlay on the keyset.
- 2) Place the protective cover on the line/feature key overlay. Lock the cover in place by inserting the tabs into the keyset slots.
- 3) Insert the retractable directory card into the baseplate retaining channel.

3.2 Desk Mounting:

- 1) Turn the keyset over and place it facedown on a table. Plug one end of the coiled handset cord into the jack labeled "Handset." Press the first two inches of the handset cord into the notched strain relief channel. See Figure 3-6.
- 2) Plug one end of the gray line cord into the jack labeled "Line."
- 3) Turn the baseplate upside down. Insert the baseplate hooks into the upper slots of the keyset. The raised end of the baseplate should face the line jack at the top of the phone. See Figure 3-7.
- 4) Rotate the baseplate down. The tab on the baseplate should contact the lower keyset slot labeled "Open." Press the baseplate tab until it snaps into place with an audible click.

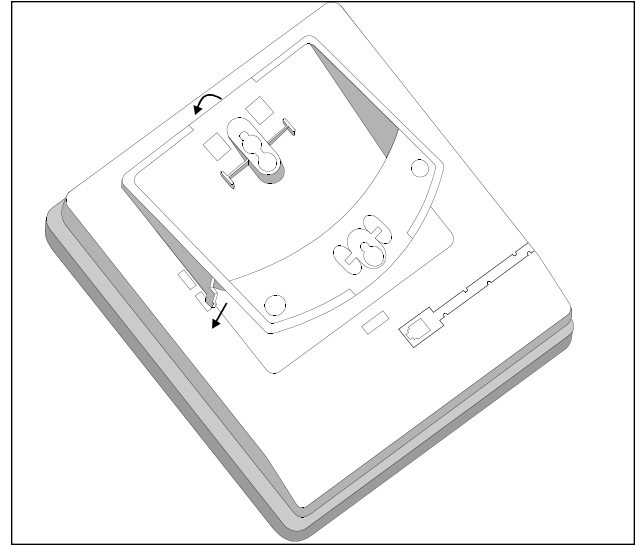


Figure 3 - 10: For a wall mount, turn the baseplate upside down and insert the baseplate hooks into the lower slots in the keyset. The raise end of the baseplate should face the handset jack.

- 5) Turn the keyset and attached baseplate over. Place it on its designated desk.
- 6) Plug the free end of the coiled handset cord into the jack on the handset. Place the handset in its cradle.
- 7) Plug the free end of the gray line cord into the wall-mounted modular jack.

3.3 Wall Mounting

- 1) Lift the cradle tab and rotate it 180° until it clicks into the keyset. See Figure 3-8.
- 2) Turn the keyset over and place it facedown on a table. Plug one end of the coiled handset cord into the jack labeled "Handset." Press the first two inches of the handset cord into the notched strain relief channel. See Figure 3-6.
- 3) Thread one end of the gray line cord through a square hole in the baseplate and plug the cord into the jack labeled "Line."
- 4) Turn the baseplate upside down and insert the baseplate hooks into the lower slots of the keyset. The raised end of the baseplate should face the handset jack at the bottom of the phone. See Figure 3-9.
- 5) Rotate the baseplate down. The tab on the baseplate should contact the upper keyset slot labeled "Open." Press the baseplate tab until it snaps into place.
- 6) Align the holes in the baseplate over the studs of the wall-mounted plate. Press downward until the baseplate locks into place.
- 7) Plug the free end of the coiled handset cord into the jack on the handset. Place the handset on its cradle.

-
- 8) Plug the free end of the gray line cord into the wall mounted modular jack.

3.4 Install Single-Line Phones and Analog Devices

Follow the instructions provided with the single-line phone or analog device for installation and connection. Singleline phones and analog devices must be connected to analog adapters connected to the 6/6 KSU. Some analog devices, like voice mail systems, may require additional software configuration. See chapter 4, "Features," and chapter 5, "Programming," for more information.

4. Install Optional Peripheral Equipment

Follow the instructions provided with optional peripheral equipment. Such equipment may include external paging systems and music on hold devices.

Important

The AC Adapter must be either plugged into or unplugged from the AC outlet to apply or remove power from the Protegé® 616 KSU.

5. System Initialization

When the installation steps explained in this chapter have been completed, the 616 system can be initialized. Initialize by following these steps:

- 1) Ensure that the AC power cord is not connected.
- 2) Turn the Ram Switch to the Reset position.
- 3) After 10 seconds, return the switch to the ON position.
- 4) Connect the AC power cord.
- 5) Watch the red heartbeat LED for a flashing heartbeat. It should begin after four to six seconds. The Protegé® 616 system has now completed initialization and the default database is loaded. Turn to chapter 5, "Programming," for more information about customizing the database.

4 Features

This chapter explains the features that function on the Protegé® 616 system. These features may function slightly differently than the features on the Protegé CTX, MTX and LTX. Please read through the features carefully. Included with each feature description is either the display keyset Function codes or the location in database for programming the feature.

1. System Features

1.1 Alphanumeric Display

DATABASE PROGRAMMING - NONE

All display keysets provide a two-line liquid crystal display (LCD) that supports 16-alphanumeric characters on each line. Any LCD equipped keyset may be used for system database programming. It also offers station users the ability to view existing messages including time and date, system service mode, call status, operation prompt and related indications.

NOTES

- The message with the highest priority will be displayed on an LCD. The display priority for messages is as follows:
 - Database Programming/Feature Programming
 - Call Waiting Notification
 - Set Alarm Clock
 - Current Operation
 - Recall, Transfer, Incoming, Camp On line signaling
 - ICM call signaling
 - Message Waiting Application
 - Call Again Application
 - DND/CFW Indication
 - Advisory Message
 - Time & Date and Service Mode
- In day service mode, time & date are displayed on the first line with extension number and

extension name, if programmed, on the second. In night service mode, "night" replaces extension name.

1.2 Alternate Answering Position (Overflow Attendant)

DATABASE PROGRAMMING - 4. RESOURCE - ALTERNATE

A single extension can be programmed as the "alternate" attendant. The alternate attendant will receive incoming or recalling CO line calls, if they are not answered by the primary attendant within the programmed alternate ring time or recall time.

NOTES

- An incoming line call that has gone unanswered for 30 seconds at the Attendant position automatically will ring at both the Attendant and Alternate Attendant.

1.3 Analog Adapter

DATABASE PROGRAMMING - NONE

An Analog Adapter is provided for connection of standard, two-wire analog telephone equipment to the digital network of the system. Reasons for using the analog adapter would be to connect faxes, modems or single line telephones to the 616 system. The analog adapter is a self-contained, system powered apparatus that creates two (2) separate analog extension ports from one system digital 2B+D extension port. In order to make outgoing calls, the analog telephone must supply DTMF tone dialing which is decoded by the analog adapter for call processing instructions. The analog adapter provides two dedicated DTMF receivers for decoding the digits dialed from the two analog ports. Two ringing generators are supplied with each analog adapter for 25 cycle frequency ringing of the single line telephones connected to it.

Single line telephones are not traffic sensitive and

do not require special traffic balancing for two reasons. First, each analog adapter provides dedicated DTMF receivers and ringing generators. Second, the system has a non-blocking digital intercom bus.

NOTES

- The feature Automatic Line Selection changes to "NULL" automatically if an analog adapter is connected to a port that previously had a keyset with Auto Line Selection programmed connected.

1.4 Attendant

DATABASE PROGRAMMING - 4. RESOURCE - ATTENDANT

The system provides for a primary attendant to answer all incoming line calls and to support necessary functions such as line recall. A second, alternate attendant may be established for common sharing of incoming CO calls or for load sharing during peak traffic periods. A keyset with display is needed at the attendant position. Only the attendant and alternate attendant are allowed to manually control Night Switching from the keyset.

1.5 Background Music

DATABASE PROGRAMMING - NONE

FUNCTION 52

When a station is not in use (i.e. on-hook), users can enjoy music through speaker by pressing a specific function code or programming a feature key. The function code or feature key acts as toggle turning the music on and off.

When keyset goes off hook, the music stops playing, and resumes playing after the keyset goes on-hook.

1.6 Barge In

DATABASE PROGRAMMING - 3. CALL HANDLING - INTRUSION

FUNCTION 72

Protegé[®] 616 allows station users the ability to interrupt a line call between another station user and an outside party. To intrude on a call, the station user has to be of an equal or higher Class of Service and intrusion must be enabled system wide through database programming.

NOTES

- If the alert tone is enabled, the extension receiving the intercom call will hear an alert when the Barge In occurs.
- Once the Barge In occurs the callers are on a conference call.
- Only one Barge In can occur at a time.
- A caller cannot use the Barge In function if already on a call.

- If the Barge In is unsuccessful, then the Business sets will hear the error tone.
- Barge In cannot be completed onto conference calls.
- Barge In calls cannot be placed on Hold.
- Barge In calls will be released when caller presses the ICM, outside line, feature or function keys.
- Barge In should not be enabled when Call Waiting is enabled.
- An extension that receives a Barge In call cannot reply to Call Waiting. If the extension that performed the Barge In replies to Call Waiting, the system releases the Barge In automatically.

1.7 Battery Back Up

DATABASE PROGRAMMING - NONE

In case of a power outage the system provides database back up and protection through a Nickel-Cadmium battery.

1.8 Calling Party Identification

DATABASE PROGRAMMING - 4. RESOURCE - USER NAMES

An internal caller's extension number and programmed name appears on display keysets. A programmed user name and extension number replaces the date and time on most message displays.

1.9 Call Operator (Call Attendant)

DATABASE PROGRAMMING - 3. CALL HANDLING - OPERATOR

CODE

The Call Operator feature allows extension users to place an intercom call to the designated attendant by dialing the digit '0' or '9' instead of dialing the attendant's extension number.

The operator code is programmable in database programming.

NOTES

- Since the access code for the Operator and an outgoing line can be customized, the Protegé[®] 616 system follows this operation:
If the operator code is "0" (default)
Dialing ICM + 0 calls the Operator
Dialing ICM + 9 seizes an available line

If the operator code is "9"
Dialing ICM + 9 calls the Operator
Dialing ICM + 0 seizes an available line

1.10 Class Of Service

DATABASE PROGRAMMING - 1. EXTENSION - DAY/NIGHT

CLASS OF SERVICE

All extensions are assigned a Class of Service (COS) to determine what features are available to each extension user. There are eight different COS, which are numbered from 0 to 7.

Station COS is associated with toll restriction for both day and night times, Barge In and DND override.

1.11 Database Programming

In database programming mode, there are six programming categories. These categories are Extension, Trunkline, Call Handling, Resource, Restriction and Control.

Database programming is done from a display keyset. Menu options are displayed on the LCD for each of these six categories. There are three dedicated soft buttons to help with the programming. Different messages/prompts are displayed for each programming item to guide the administrator. Note, any extension user may enter database programming if the extension has a display keyset and knows the system password. The default system password is six digits '000000' and can be changed through system programming.

1.12 Dialing Type Selection

DATABASE PROGRAMMING - 2. TRUNKLINE - SHOW LINE - TYPE

Outside lines can be programmed to send either DTMF or Pulse mode to meet the requirements of the routing carriers.

NOTES

- Signaling time has to be programmed when DTMF dialing is selected. There are three programmable signal times: 70ms, 90ms or 120ms.
- When pulse dialing is selected the system conforms to a make/break ratio specification of 40/60 and sends 8 to 11 pulses per second on the line during dialing.

1.13 Dial Intercom Non-blocking

DATABASE PROGRAMMING - NONE

Intercom calls are not restricted because of the switching links provided by the system.

NOTES

- Any incoming intercom call can reach any station when the extension is on-hook.

1.14 Discriminating Ringing

DATABASE PROGRAMMING - NONE

Incoming line ring (camp-on line recall ring) and intercom ring (ICM recall ring) can be distinguished by their different ring time intervals (i.e. ring cadence).

1.15 External Music Source

DATABASE PROGRAMMING - NONE

Protege[®] 616 provides one mono interface for those companies that require music on hold or background music. Music can be obtained from a variety of sources including radios, CD and tape players and other audio devices. The Sprint Products Group, Inc. MOH 5.0 (material code 994050) can be connected to the 616 and allows approximately 5 minutes of messages and music to be recorded. Call your Sprint North Supply representative to order.

1.16 External Page

DATABASE PROGRAMMING - NONE

FUNCTION 50x

Protege[®] 616 provides one interface for those companies that require the ability to perform external paging. The system must be connected to an amplifier in order for pages to be broadcast over the external paging equipment rather than the speaker that comes with the keyset.

1.17 Flexible Line Assignment

DATABASE PROGRAMMING - 1. EXTENSION - LINE ASSIGNMENT

A line or group may be assigned to an extension for the purpose of making outgoing calls only. This assignment is not a Private line. The attendant answers all incoming calls on the line or group.

1.18 Flexible Receive Assignment

DATABASE PROGRAMMING - 1. EXTENSION - RECEIVE ASSIGNMENT

Each line can be assigned to allow a specific extension or extensions to answer an incoming call even if the line is not programmed to ring the extension(s). This assignment does not override any extension restrictions placed on outgoing calls on lines that have this programming.

1.19 Flexible Ring Assignment

DATABASE PROGRAMMING - 1. EXTENSION - RING ASSIGNMENT

Extensions that have lines set to "Yes" under the Flexible Ring Assignment programming will hear ringing at their desk, and, if Receive Assignment is set to "Yes," they have the ability to answer the call. Those that have lines set to "No" will not hear ringing.

1.20 Hold Reminder

DATABASE PROGRAMMING - 3. CALL HANDLING - REMIND TIME

The system will remind extension users that an ICM or outside line call is still on hold after a specified period is elapsed. The reminder time is programmable in database programming.

NOTES

- The Hold Reminder time is programmable in 10 second increments from 0 - 90 seconds. Zero (0) disables the reminder.
- Both intercom and outside calls are subject to the Hold Reminder.

1.21 Hour Mode

DATABASE PROGRAMMING - NONE

System time is presented in 12-hour manner only for keyset users' LCDs.

1.22 Incoming Call Line Identification (ICLID)

DATABASE PROGRAMMING - 2. TRUNKLINE - ICLID

Each line can be assigned to detect and display ICLID information on incoming calls if subscribed to from the local central office. The Protegé 616 supports caller ID number, name, or name and number delivery. When enabled, the system monitors the line between the first and second ring cycle for delivery of ICLID information. During this time the line is in a busy state and cannot be accessed by extensions. Upon receipt of the second ring signal from the C.O. the system then generates ringing to assigned extensions and displays the appropriate caller ID message.

1.23 Line Group Assignment

DATABASE PROGRAMMING - 2. TRUNKLINE - LINE GROUP

Each line can be assigned to any line group, but it can belong to only one line group. When accessing any line group, one of three idle lines belonging to that group will be occupied. Protegé 616 provides two line groups.

1.24 Line Interface

DATABASE PROGRAMMING - NONE

Protegé 616 can access only Loop Start lines, in which loop current is used to determine if the call is still valid.

1.25 Line Signaling

DATABASE PROGRAMMING - NONE

Stations with ring assignment enabled will begin ringing when incoming line calls are signaling. The line call status can be monitored from the LCD display, if the extension is a display keyset, and from the line lamp.

NOTES

- Only extensions with corresponding line ring and receive assignments will display the current incoming line call status and are allowed to answer.
- The incoming call signaling will be disconnected when the calling parties abandon the call before it is answered. The time for disconnect is between 1.6 and 6.4 seconds, which is dependent on the central office. The outside line will be returned to idle.

1.26 Line Type Assignment

DATABASE PROGRAMMING - 2. TRUNKLINE - LINE TYPE

Each line can be assigned a type so that the system will identify how that line is to be used. The normal type assigned is Central Office. However, Protegé 616 allows lines to be connected behind a PBX or CENTREX or have a PAGE system connected.

NOTES

- If a line type assignment is PBX, the user must dial the PBX access code before dialing the telephone number. The PBX Access Code must be programmed.
- If a line type assignment is Page, neither an incoming or outgoing line can be held or parked. The Flash, Conference, pause and last number redial features cannot be used. The line marked Page cannot be selected by Automatic Line Select.
- If a line type assignment is Empty, extensions cannot make outgoing calls on that line, but an extension can receive an incoming call, but the incoming call cannot be further processed (held, transferred, etc.).

1.27 Music On Hold

DATABASE PROGRAMMING - NONE

External music, if connected, can be heard by the party on hold on an ICM or line call.

1.28 Night Service Station

DATABASE PROGRAMMING - 1. EXTENSION - RING ASSIGNMENT - NIGHT MODE

Protegé[®] 616 assigns specific extensions to ring after hours, and to answer the incoming call at the night-time. This only works when the system is in night mode.

1.29 Pause

DATABASE PROGRAMMING - 3. CALL HANDLING - PAUSE TIME

Protegé 616 allows for a pause to be inserted between two digits of a stored speed dial number or during manual dialing. This allows the 616 to be compatible with some switching systems. The pause can be programmed in the Call Handling section of database programming.

1.30 PBX Compatibility

DATABASE PROGRAMMING - 3. CALL HANDLING - PBX CODE

If the system is connected behind either a PBX or a CENTREX line, an access code will need to be programmed. This one or two digit number is used to seize a line on the PBX or CENTREX line.

NOTES

- After a PBX access code is entered, the system will pause for a programmable length of time and then resume dialing. The programmable length is 1 - 9 seconds.

1.31 Power Failure Transfer

DATABASE PROGRAMMING - NONE

When commercial power fails, the Protegé 616 automatically will switch the first line on the 308 board to a dedicated phone connection port. All incoming calls from line 1 will be answered by a single-line telephone connected to this auxiliary port when power is not applied to the system.

1.32 Privacy

DATABASE PROGRAMMING - 3. CALL HANDLING - INTRUSION

With intrusion disabled in programming privacy on every call is ensured. With intrusion enabled in programming, intrusion is not allowed on a conversation by extensions with a lower COS than that of the extension engaged in the conversation.

1.33 Private Line

DATABASE PROGRAMMING - 2. TRUNKLINE - PRIVATE TO

Extensions may be assigned an exclusive line to use, and no other extension can access that line. Incoming

or held calls on this private line cannot be answered by other extensions.

NOTES

- Private line programming overrides line ring and receive assignments.
- Canceling Private Line will make the line accessible to all extensions in the same extension group.

1.34 Recall

DATABASE PROGRAMMING - 3. CALL HANDLING - RECALL TIME

A transferred call that is not answered at an extension within a specific time period will recall to the original transferring station. If there is no answer at that extension within a system specified recall time, the call will roll over to the attendant.

When the call is answered, a 'Recall' message including the line number will be displayed to distinguish from new incoming calls.

If the attendant does not answer the call within a 5 minute period of time, the call is dropped. The answer supervision time for transferred calls and first recall will follow the same timer that is programmable.

NOTES

- The displays of all extensions except the transferring extension and the attendant will show busy.

1.35 Ringing Line Preference

DATABASE PROGRAMMING - NONE

Protegé[®] 616 follows a predefined priority sequence for answering calls by lifting handset or pressing the speaker key. The calls are answered as shown below:

- 1) Camped line
- 2) Recalled line call
- 3) Transferring line call
- 4) Incoming line call
- 5) ICM callback
- 6) Incoming ICM call

1.36 Soft Key

DATABASE PROGRAMMING - NONE

Each display keyset has three softkeys that are used to display the currently allowed specific functions available during call operation or feature programming. With these keys, phone call functions and programming are easier for the extension users.

1.37 Speed Dialing (System)

DATABASE PROGRAMMING - 4. RESOURCE - SPEED DIALING
 1. EXTENSION - DAY/NIGHT COS
 1. EXTENSION - SYS SPD CHECK

There are 80 system speed dialing numbers (20 - 99) available. Each system speed dial number can store up to 16 digits of a telephone number, including Pause, Flash or SPD chain. Any extension is allowed to use the system SPD number, but toll restriction may be checked according to an extension's class of service and Sys Spd Check setting.

1.38 Station Group Assignment

DATABASE PROGRAMMING - 1. EXTENSION - EXT. GROUP
 All extensions can be assigned to different station group numbers for group call pickup. There are four different station groups available. Group numbers are used for paging and group call pickup.

1.39 Station Numbering Plan

DATABASE PROGRAMMING - 1. EXTENSION - EXT. POSITION
 The system provides a default station numbering plan for easy call operation. Customized system configurations may need their own special numbering plan.
 The default station numbering plan is from 10 to 25 for all extensions occupying the B1 channel in the system, and ranges from 58 to 73 for all extensions occupying the B2 channel when an analog adapter is connected. Each station number is interchangeable with a vacant number. When a change is made to a vacant station number to identify the extension, the original station number becomes vacant. The station number range the system allows is from 10 to 81.

1.40 System Time

DATABASE PROGRAMMING - NONE
 The system uses a timer IC for reference for such functions as the system service mode change and reminder clock functions.

- NOTES**
- The system clock detects leap year (February 29), but not daylight savings time.

1.41 Toll Restriction

DATABASE PROGRAMMING - 5. RESTRICTION
 Toll restriction is used to prevent extensions from making certain types of phone calls during day and night hours. It can save on unnecessary phone charges. Call restriction control is based on the extension Class of Service (COS) which is associated with restriction table. For outgoing calls, if the dialing digits are restricted in the restriction table, the call will be dropped and extension user will be given a congestion tone.

- NOTES**
- When a line call is restricted, the outside line will be released and a congestion tone will be heard.
 - Extension's line call will always be checked against the interval table programmed in the Restriction section of database programming.
 - The Interval Table programming at default is as follows:

1.42 Tone Duration Selection

DATABASE PROGRAMMING - 3. CALL HANDLING - TONE TIME
 Depending on conditions, such as the type of central office and the customer's specialized dialing requirements, the DTMF "ON" time of each manually or

Toll Restriction Interval Table				
	From	To	Extension Day COS 0 1 2 3 4 5 6 7	Extension Night COS 0 1 2 3 4 5 6 7
001	0	#	Y N N N N N N N	Y N N N N N N N
002	NULL	NULL	N N N N N N N N	N N N N N N N N
003	NULL	NULL	N N N N N N N N	N N N N N N N N
...
...
...
100

Table 4 - 1: Toll Restriction Digit Interval Table

speed dialed digit may be modified. In the system, the tone duration time can be adjusted.

1.43 User Name Programming

DATABASE PROGRAMMING - 4. RESOURCE - USER NAMES

Each extension may be assigned a specific name for easy identification. When making an ICM call, if the name is programmed, it will replace the extension number on the LCD display. The keysets will display the programmed name instead of the extension number in most of call operations.

1.44 Voice Mail

DATABASE PROGRAMMING - 6. CONTROL - VOICE MAIL

The Protegé[®] 616 provides basic voice mail integration. Analog extensions can be assigned to a voice mail hunt group. Calls to the voice mail group will hunt from the first member to successive members. Calls will hunt to the next member only if the preceding member is in a busy or ringing state. Extension users may have a voice mail key assigned to their keyset for easy access to voice mail, for transferring and forwarding calls to voice mail and for voice mail message waiting indication.

NOTES

- The voice mail system must be programmed to light message waiting lights using the message waiting feature code, #96 plus the extension number. To extinguish the MWI, enter # *96 plus the extension number.

2. User Features

2.1 Alarm

FUNCTION 92 (ON) FUNCTION *92 (OFF)

This feature allows a station user to enable an alarm clock at his keyset. Upon reaching the programmed time (input in 24-hour mode) the system will issue a repeated ring alert to the extension and display an alarm notification message. The alarm may be set up for one time use only or for repeated occurrence each day at the programmed time.

NOTES

- Only one alarm per extension can be programmed at a time.
- The Protege[®] business and business with display keysets ring when the time programmed is reached, even if the keyset is not idle.
- Business with display keysets will have a visual display when the alarm time is reached.
- The alarm rings for 60 seconds.

2.2 Auto Answer

FUNCTION 6*

This feature allows a keyset user to be automatically connected to a ringing call simply by lifting the handset or pressing the speaker key. With this feature disabled the extension user must select the feature key associated with the ringing intercom or line call to be connected.

NOTES

- Auto Answer cannot be programmed on a single line telephone.
- If Auto Answer is disabled, the user must press the flashing ICM or line key to answer a call. Going off-hook will access the ICM or idle line programming found in "Auto Line Selection."

2.3 Automatic Hold

FUNCTION 94

When a call (either incoming or outgoing) is in progress, pressing the ICM key, a feature key or another line key will put the current call on system hold. The station user chooses whether to use this function. Note, digits must be dialed on an outgoing call for this function to work.

NOTES

- User cannot "toggle" between two intercom calls using the Automatic Hold feature.
- Line calls are placed on System Hold when Automatic Hold is used. The lamp indication will be the same as System Hold.
- A feature key programmed with Automatic

Hold will be solid red when the feature is enabled.

2.4 Automatic Line Selection

FUNCTION 95 (ON) FUNCTION *95 (OFF)

The system automatically chooses an ICM link, any idle line, specific prime line, or idle line in specific line group for a station user when that extension goes off hook or presses the Speaker key. The incoming ringing line/ICM call has a higher priority than idle line/ICM to be picked up.

NOTES

- Lines that are programmed for Auto Line Selection cannot be programmed as "Empty" or the extension will receive a warning tone/message when it goes off-hook.
- If Automatic Line Selection is set to ICM, "Voice Call" and "Auto Answer" are disabled, the user must press the flashing ICM or outside line key to answer a call. Going off-hook will access the ICM.
- If Automatic Line Selection is set to Line at an extension, then any call that was held or parked on that line, by any extension, will be accessed when that extension goes off-hook.

2.5 Busy Ring

FUNCTION #2 (TOGGLE)

This feature allows each station user to enable or disable ringing at his phone while in a busy state. If disabled, while the user is busy on one call, additional calls will not ring at his phone. Visual indication of additional calls will still be presented on feature keys and the LCD.

At default Busy Ring is enabled for all extensions.

2.6 Callback

FUNCTION 91 (ON) FUNCTION *91 (OFF)

When an intercom call is placed to a busy extension, the calling extension can request a callback and hang up. When the busy extension goes on-hook, the extension that requested callback is signaled for 30 seconds. If the calling extension goes off-hook, the system automatically places an intercom call to the now idle extension.

NOTES

- An extension can either enable a callback or reply to a callback to only one extension at a time.
- A Business keyset with display that does not answer a callback during ringing will receive a message on the LCD.
- Callback starts when both the calling and called parties are on-hook.

2.7 Call Forward

FUNCTION 2X (ON) FUNCTION 2 (OFF)

Call Forward reroutes incoming calls from an extension to another destination.

There are three kinds of call forwarding:

- 1) Busy Call Forward - A Busy Call Forward forwards the specified call type (intercom and / or CO) immediately if the extension is busy.
- 2) No Answer Call Forward - A No Answer Call Forward forwards the specified call type (intercom and / or CO) upon the expiration of 14 seconds.
- 3) Direct Call Forward - A Direct Call Forward forwards the specified call type (intercom and / or CO) immediately regardless of extension's status.

NOTES

- Call Forward and DND are mutually exclusive and cannot be enabled by an extension at the same time.
- Only one Call Forward can be enabled at a time.
- Any previous Call Forward programming will be deleted when new programming is entered.
- If an extension attempts to program a Call Forward to an extension that is also forwarded the forwarding will be prohibited, error tone will be received and the display message FWD PROHIBITED will be presented.
- If multiple feature keys are programmed with Call Forward, only the last key programmed will be enabled.
- The extension that has another extension forwarded to it is prohibited from forwarding.
- When a C.O. line is assigned to ring at multiple extensions, if any of the extensions are forwarded, direct ring in calls will ignore the forward.

2.8 Call Park

FUNCTION 73 (TOGGLE)

Calls can be parked at any extension number in the system for retrieval by any other extension via the Call Park Answer feature. The call appears on hold at all telephones where the line appears. A call parked at an extension is treated as a transferred call without the ringing alert tone. The parked call will recall to the originator and if unanswered will recall to the attendant. The LCD does not show from which extension the call is recalling. It also remains on hold at the other extension while recalling.

NOTES

- Each extension can have only one outside line call "parked" at a time.
- A conference call cannot be "parked."
- If the "parked" outside line is not answered within the programmed recall time, the call

reverts to the originator. If the originator does not answer within 30 seconds, the call rings to the attendant. If the attendant does not answer within 5 minutes, the call is dropped.

- If a call is "parked" on an extension and for programming purposes the extension number is changed, then the call is retrieved by dialing F73 plus the new extension number.
- To answer a "parked" call that recalls to the originator or attendant press F73 plus the extension number where the call was originally parked or F73 + 0 + the line number.
- If extension has Auto Hold disabled and is currently on an intercom call, then the system will release the intercom call before answering the "parked" call. However, if the extension has Auto Hold enabled, the system will put the intercom call on hold before answering the "parked" call.

2.9 Call Pick Up (Group/Direct)

FUNCTION 53 (DIRECT) FUNCTION 54 (GROUP)

Call Pick Up allows extension users to answer a call that is ringing at an extension other than their own. Group Call Pick Up allows picking a ringing extension that belongs to the same extension group. The extension can answer ringing ICM calls, voice calls, recalled CO lines, incoming CO lines, and transferring CO line calls.

Direct Pick Up allows station user to answer any ringing call for a specific extension.

NOTES

- The priority for call pick up is:
 - Recalled line call
 - Transferring line call
 - Incoming line call
 - Incoming ICM call
 - ICM voice call
- Does not pick up calls on hold or that have been parked.
- If "Hot Dialpad" is enabled, the user can press "*" to perform a Group Pickup. If "Hot Dialpad" is disabled, accessing the ICM line must be done before pressing "*."

2.10 Call Waiting

FUNCTION 99 (TOGGLE)

Any extension with a display keyset can enable this feature. It allows other extensions to call that extension while it is busy. The extension receives LCD indication and a single 'warning' tone to notify the user there is a call waiting. The calling party will hear ringback tone instead of busy tone.

NOTES

- If an extension has Auto Hold disabled and is currently on a call, then the system will release the current call upon replying to Call Waiting.

However, if the extension has Auto Hold enabled, the system will put the current call on hold before connecting the new call.

- A feature key programmed with Call Wait Allow will be solid red when the feature is enabled.

2.11 Camp On Busy Line

(ON) FUNCTION *93 (OFF)

Camp On Busy Line allows a user exclusive access to a line once a busy line becomes idle. The user presses a feature key or dials a function code to send notification to the system that access is needed. As soon as that line becomes idle, Protegé® 616 will ring the extension that camped on for 30 seconds. Within this 30-second period, only the camped on extension is allowed to access it.

But if the camped on extension does not answer after 30 seconds, the line is returned to idle.

NOTES

- If an incoming call rings in on the line that has the camp on, the camp on will be canceled and the extension user will receive the incoming call.

2.12 Camp On Busy Station

2

Camp On Busy Station allows a user to wait for a busy extension until it becomes idle. The user presses a feature key or dials a function code to send camp on notification to the busy extension and remain off-hook waiting for the extension to return to idle.

As soon as that extension becomes idle, the camped on extension automatically will ring to that extension.

NOTES

- Only one extension can camp on another at one time.
- If background music is programmed, the calling party will hear the background music.
- The called party will be alerted by a tone from the handset every 30 seconds.
- Camp On does not operate on extensions with Call Waiting enabled.

2.13 Conference

XFR/CONF OR FUNCTION 60

The conference feature allows a keyset user, known as the controller, to connect up to three additional parties into a single conversation. A single line telephone cannot establish a conference, nor be a conference controller. The conferenced parties can include any combination of extensions and CO lines. Protegé 616 system supports four-party conferences with a total of up to eight (8) simultaneous conferences. The

conference controller has the option to force individual parties out of the conference, to add individual parties when others drop out, or have a private conversation while putting the other parties on hold. One button access to the conference feature is available. Follow instructions on how to program a feature key in any user guide. The feature code is Function key, dial 60.

NOTES

- If the controlling party drops out, there must be an internal party to assume control of the conference.
- Calls that are part of the conference are placed on Exclusive Hold.
- All parties will hear a tone when entering the conference.

2.14 Dial Access to Features

System features can be accessed two ways. One is by dialing the access code preceded by the Function key. The other is to pre-program feature keys with the function codes for one button operation.

2.15 Dial Pulse to DTMF Conversion

*

Digital keysets can switch from pulse to DTMF dialing mode. This feature enables the keyset to place a call over a pulse line and then switch to DTMF to use automated features on the called system. Press the asterisk (*) key prior to dialing the actual DTMF tone digits.

2.16 Direct Station Selection (DSS)

FUNCTION #3

Keyset feature keys can be programmed as DSS keys. A DSS key can connect with a specific extension or voice mail group. After programming the feature keys, press a key to make an ICM call directly to its corresponding extension instead of dialing the extension number. Generally, pressing a DSS key is permitted in the set up and execution of features just as if the user dialed an extension number from the dial pad.

2.17 Distinctive Ringing (Station)

FUNCTION #7

Distinctive ring tones can be selected allowing adjacent keyset users to discern which keyset is ringing without actually looking at the keysets. Four ring tones can be used. The ring tone selected is heard for CO calls, intercom calls, and as a confirmation tone.

2.18 DND (Do Not Disturb)

FUNCTION 4 (TOGGLE)

Extension users can enable DND to stop incoming CO and intercom calls from ringing at their phone.

Note, the call forward and DND features are mutually exclusive and cannot be enabled at the same time.

2.19 DND Override

Extensions that have an equal to or higher COS are allowed to override the DND function when calling another extension where DND is enabled. This feature is available only for extensions with display key-sets.

NOTES

- If Voice Call Allow is enabled, this will place handsfree call to extension in DND.

2.20 Exclusive Hold

FUNCTION HOLD

This feature permits an extension user to place an outside line call on exclusive hold at any time. This prevents another extension from picking up the call until after the exclusive hold time expires. Once the exclusive hold time expires, the call will be placed on system hold.

NOTES

- Lamp indications for a call on Exclusive Hold are fast flashing green lamp at the extension that placed the call on hold and solid lit red lamp at all other extensions.
- Exclusive Hold is for outside line calls only.
- Exclusive Hold time is programmable from 0 to 8 minutes. Zero (0) disables Exclusive Hold.
- At default, Exclusive Hold is disabled (i.e., set to zero).

2.21 Feature Cancellation

Extensions can cancel previously programmed features, such as Premise Messages, Line Camp On, etc., by pressing the Function key, followed by an asterisk (*) and the access code of the feature to be canceled.

NOTES

- Features that can be cancelled using this method are:
 - F*91 - Callback Delete
 - F*92 - Extension Alarm Clock Delete
 - F*93 - Camp On Busy Line Delete
 - F*95 - Auto Line Selection Delete
 - F*96 - Message Waiting Delete
 - F*90 - Premises Message Delete

2.22 Flash

FUNCTION 3

The FLASH key, if programmed, or its access code can be pressed to generate a loop break duration on the line call in order to request some features or ser-

vices which are provided by CENTREX or Central Office carriers.

The 'loop break' time for flash is programmable.

NOTES

- Flash code (F3) may be stored in SPD number.

2.23 Hold

HOLD

This feature permits extensions to put ICM or outside line calls on hold, and the held party will hear music on hold (if equipped). An ICM call on hold cannot be picked up by any other extension except the extension that originally placed the ICM call on hold.

2.24 Hold Indication

At an extension a fast green flash on a line lamp indicates that a line call was placed on hold by that extension. Meanwhile, the corresponding red line lamp at other extensions is flashing slowly or lit, depending on if the call is a common hold or an exclusive hold.

2.25 Hot Dial Pad

FUNCTION #6 (TOGGLE)

When enabled, the Hot Dial pad feature allows key-set users to dial without first accessing intercom dial tone by lifting the handset or pressing the speaker key.

NOTES

- When Hot Dial Pad is disabled, the user must press the speaker key or lift the handset before pressing the intercom or outside line key.

2.26 ICM Voice to Ring Call

Interchange

*

When making an ICM call to another extension, the caller can press the asterisk (*) key to change the mode from voice page to ringing.

NOTES

- Voice Call Allow must be enabled.
- ICM Voice to Ring Call Interchange will work when ICM Mode is set to Ring or Page.

2.27 In Use Indication

At an extension a twinkling green signal on a line lamp indicates that the extension is connected to a call on that line. The other extensions' corresponding line lamp is lit solid red.

2.28 Key Inquiry

FUNCTION #3

Extension users may program display keyset feature keys with specific functions, and then check to see what functions are programmed under a specific key. The programmed feature content will be displayed on LCD upon key inquiry. Note: refer to the feature 'Programmable User Feature Keys'.

2.29 Last Number Redial (LNR)

FUNCTION 8

The system stores in its memory the last number that was dialed from that extension. This saves the extension user the time required to manually redial a number. Protegé 616 will try to use the line used to dial the number previously. If that line is busy, the system will use any available line to perform the Last Number Redial.

NOTES

- Error tone and message are received in two different instances: if no line is available or if LNR buffer is empty.
- If currently connected on an outgoing call (where digits were dialed), pressing F8 will create a CO Flash automatically before redialing the last dialed number.

2.30 Line Pool (Group)

FUNCTION #3

Extension users may program a feature key as line pool (line group) key. This allows the extension user to access any idle line by pressing the Line Pool key. Incoming line calls on all members of the line pool will be indicated by this key's lamp, and it can be pressed to answer the call.

NOTES

- If an extension has multiple line group keys programmed without individual line key:
 1. Incoming call will be indicated on only one idle line group key to which the line is assigned.
 2. Incoming call can only be indicated on its located line group key.
 3. Pressing an idle line group key will select any idle available line in a specific line group.
- If extension has a line group key and individual line key programmed:
 1. Incoming line call is indicated on the individual line key only.
 2. Pressing an individual line key will not affect the lamp indication of group key if programmed.
 3. Pressing an idle line group key to occupy/answer line calls will affect the lamp indication of individual line key, i.e. line status will be indicated on both line group and indi-

vidual line key.

4. The lamp indication on both the line group and individual key are treated in the same way.

- When all lines in one group are busy, any attempt to access idle line by pressing the line group key will receive busy tone. When all lines in a group are busy, the line group key will be lit solid red.

2.31 Manual Line Access

Extension users may press individual line keys, if they are programmed, to make outgoing calls, answer incoming calls, or to pick up a call on hold.

2.32 Meet Me Answer

FUNCTION 59

All and External Paging may be answered at any extension by pressing specific access codes. Group Paging can only be answered if the extension is in the group that was paged.

NOTES

- Pressing the "Clear" key cancels a page.

2.33 Message Waiting

FUNCTION 96 (INVOKE) FUNCTION *96 (CANCEL)

Messages can be sent from one extension to another within the system. If a keyset user has a feature key programmed as a message wait key, it will flash red when a message has been received. In addition, the LCD of a display phone will display a message waiting indication. The extension users with a display keyset can answer the calling party or delete the message. If there are multiple messages, the extension users can scroll through the messages on the LCD and choose the order in which callbacks will be done. Or, they can delete messages without replying. Each extension can leave and receive multiple messages.

NOTES

- Total number of allowed messages that can be stored in the system buffer is 10.
- Extensions with display keysets will show a message waiting until the user deletes or replies to the message.
- If an extension has Voice Call allowed, a caller will have to press * for Voice to Ring Interchange before a message can be left.

2.34 Messaging (Advisory Message)

FUNCTION 90

A Premises Message is for use on display keysets only. The extension user is allowed to choose from one of the system's six pre-programmed messages to indicate the user's current status. Besides the system-provided messages, each extension is allowed to pro-

gram one private message when Premises Message is active. When Premise Messaging is enabled at an extension, the extension will ring for ICM calls.

NOTES

- The default Premise Messages are:
Out For Lunch
Be Back Soon
Left For The Day
In A Meeting
Out Of Office
On Vacation
Empty (Private Editing Message)

2.35 Mixed Dialing

* for PULSE to DTMF

FUNCTION 70 for PAUSE

FUNCTION 3 for FLASH

When making an outgoing call, this function permits extension users to change the dialing mode from pulse to DTMF, and Pause/Flash may also be inserted anywhere to dial.

NOTES

- Only conversion from pulse to tone is allowed.

2.36 Mute (Voice Mute)

FUNCTION 76

The Mute feature allows keyset users to disable the handset transmitter or speakerphone microphone. The Mute feature can be enabled or disabled while active on a call or while idle.

2.37 Night Service

FUNCTION 63 (TOGGLE)

System can be put in Day Service Mode during regular office hours and in Night Service Mode after work hours to reach the most efficient operating condition. Function 63 acts as a toggle between the two modes. When switching between Night and Day Mode, the system does not look at the system time. This could lead to a system switching back to Day Mode after hours if the function code is entered after being switched to Night Mode.

In addition, the service mode can be programmed to change automatically in accordance with the pre-programmed night start and night end time. Note that the system regards the night end time as the day start time.

NOTES

- Any display keyset can be used to change system service mode as long as the attendant password is provided.
- If "Time" is selected, programming must be completed in the database to indicate the times to switch between day and night mode. If in "Time" mode and the system is manually changed to night mode, then "Time" mode will

have to be reenabled to have the system follow the "Time" mode.

2.38 On Hook Dialing

Without lifting the handset, users can press ICM or line key to make a call using the speakerphone.

2.39 Paging

FUNCTION 50

A Page can be initiated from any extension in the system. The page will be played through the speaker.

There are four different paging functions.

- 1) All extension paging
- 2) External paging
- 3) All extension and external Paging
- 4) Group paging

An extension may answer a page by entering a specific access code even if the page is not received at that extension. The exception to this is if it is a group page. Only members of the group can answer.

2.40 Programmable User Feature Keys

FUNCTION #3

Any feature key can be programmed with any specific function, including line key, line group key, DSS key and feature access codes.

Station user can press the programmed feature key to activate a specific function directly. Each feature key is assigned a default function at the time of system initialization.

NOTES

- The allowable programmed access code must be in the form of "Fn" or "Fnn" where "F" is Function and "n" or "nn" are digits 0-9.
- If two different feature keys are programmed with the same feature code, only the last key programmed will operate and the original key will be cleared.

2.41 Release

CLEAR

Pressing the CLEAR key will complete or abandon feature key programming and will drop any call without going on-hook.

2.42 Saved Number Redial (SNR)

FUNCTION 51

Extension users may temporarily store a dialed number into memory for future use. The extension user may access the previously stored number to make outgoing call at a later time.

In addition, when the extension user invokes SNR

in an idle state, the system will try to use the line that was used previously. If that line is busy, the system will select another idle line.

NOTES

- Pressing F51 forces the system to automatically select an available line. The saved number will dial immediately or upon expiration of the Dial Wait Time.

2.43 Service Mode

FUNCTION #0

PASSWORD 9999

DATABASE PROGRAMMING - 4. RESOURCE

The Service Mode feature allows any display keyset to change the system's Service Mode. Valid entries are Day, Night or Time. The Time service mode automatically changes between Day and Night according to the Night Switching programming in the database. Note: See *Night Service* in this section for information concerning switching to Day or Night from Time mode.

2.44 Speed Dialing (Station)

FUNCTION 1

The system allows each extension 20 private speed dialing numbers (00 - 19). Each private SPD number can store up to 16 digits of a telephone number, which may include Pause, Flash or SPD chain.

2.45 Station Feature Status Check

FUNCTION #8

With this function, extensions with display keysets can check the current content or status of certain features, including checking the dialing digits that are stored in LNR/SNR buffers. The station feature status check will provide the following information and allowed/disallowed feature status: LNR buffer, SNR buffer, Day COS, Night COS, Auto Hold, Auto Answer, Voice Call, Call Wait, Page, Busy Ring, Transfer Beep.

2.46 Transfer

Extension users may transfer an ICM or line call to other extensions that do not have DND enabled. Screened transfers can be made by placing an ICM or line call on hold first and notify the extension prior to redirecting the call.

On an unscreened transfer the transferring extension disconnects prior to the extension answering. Unscreened transfer functions the same for ICM and line calls.

1. ICM Call - The original held party becomes the calling party. Ringback tone occurs while waiting for an answer by the transferred party.

2. Line Call - If the extension does not answer the transferred call within a certain programmed period,

it will recall to the original extension.

Calls may also be transferred to the voice mail group, if programmed. When transferring a call to the voice mail group the system prompts for a destination mailbox. If no mailbox is entered, the transfer will be completed without a specific mailbox destination.

NOTES

- The recall time for transferred line calls is programmable. The programmable length is 10 - 120 seconds. The default time is 30 seconds.

2.47 Transfer Beep

FUNCTION 79 (TOGGLE)

This feature allows each station user to program his phone to receive a confirmation tone upon successful completion of a transfer.

2.48 Unanswered Call Management

FUNCTION 6#

A 50 entry table is maintained in the system for all unanswered incoming calls with ICLID messages. The calling name/number information pertaining to the call is placed in the table at the time the system determines the direct incoming call has been abandoned. The date and time of the unanswered call are also stored. Any display keyset can review the unanswered call table. If calling number was delivered the extension user can also return the call using this feature.

NOTES

- The entries are stored and displayed on a FIFO (First In, First Out) basis.
- If multiple calls from the same number are received the system only stores the most recent call.
- Only one extension at a time may view the unanswered call table.

2.49 Voice Call

FUNCTION 98

Extension users can control the way intercom calls are received with this feature. When enabled, the extension user receives an alert tone, the speakerphone is turned on and the extension is voice connected to the calling party. When disabled, intercom calls ring the keyset and the extension must answer the call to establish the voice connection.

NOTES

- When voice call is enabled, the calling party may switch the call to ring mode by using voice to ring interchange.
- Intercom calls from voice mail ports ignore the voice call setting and always ring the extension user.

2.50 Volume Control

Extension users may control the volume level for ringer, speaker, and handset respectively at their discretion. The desired level is stored in the system for future calls.

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5 Programming

This chapter provides information and instructions for programming the Protegé® 616 telephone system.

1. Software License

The purchase of the Protegé 616 software (documentation and software media) licenses the purchaser for use of this software under the following terms and agreements. Installation and use of this software binds the purchaser under the conditions set forth in this license agreement. A Sprint Products Group authorized dealer may resell this software one time. Upon resale of the software by the dealer usage rights are transferred to the purchaser and this license agreement is hereby transferred as well.

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2. System Requirements

Both the 26-Button Business Display phone and the 17-Button Business phone without display can be used with the Protegé 616 system. However, programming of the 616 can be done only from the Business Display phone.

3. Power Up Initialization

Once the installation of the system is completed, it is time to initialize the system.

1. With the KSU AC power OFF, slide the RAM switch on the KSU from "RESET" to "ON".
2. Connect the AC power adapter.
3. Observe the Power LED for a flashing heartbeat.
4. Enter database programming from a display key-set and perform a Software Cold Start.

The system has completed the power up sequence and the default database is loaded.

4. Protegé 616 Software

Once the system has completed the power up sequence, programming can be entered through an idle 26-Button Business Display phone. A series of prompts display the six programming categories

with programming items in subcategories on the phone's LCD. Each option can be displayed when programming. The six categories are: Extension; Trunkline; Call Handling; Resource; Restriction; and Control.

5. Selecting Database Items

The LCD soft button function keys that are found directly under the LCD display. The three main functions of these softkeys are to allow information to be changed, saved or cleared. Other uses for these keys include moving through programming options both backwards and forwards, displaying the current information for an option and returning to the immediate higher level category.

The uses for each of these keys is as follows:

BKSP (Backspace) - When the new programming data entry is not desired, the BKSP button erases the last entered digit allowing the new data to be entered.

SAVE - When the new programming data is entered, the system will check the entered data automatically. If the data entry is invalid, the programming prompt will be refreshed. However, if the data is valid, the softkey under the SAVE option must be pressed to confirm. After SAVE is selected, the next item or category will be displayed.

CHG (Change) - When current information needs to be modified, pressing the CHG softkey allows new options to be chosen or entered. If the information to be changed is generated by the system itself, the content of the current programming item will be displayed. Continue to press the CHG to see each of the options. If it is a field that contains only Yes or No, pressing CHG will toggle between the two. If there are several options, Protegé® 616 will cycle through all of them. If the information is not generated by the system, pressing CHG will erase the current information. For fields that accept "Null" as a valid entry, press SAVE when the field is blank.

NEXT - Press the NEXT softkey to go to the next programming item within the same category or go to the next category if the current feature item is the last one in a category.

BACK - Press the BACK softkey to go back to the previous programming item within the same category or to the previous category if the current item is the first one in a category.

SHOW (Display) - Press the SHOW softkey to enter into programming for a detailed feature item in a specific category or to display current programmed content of such feature item.

EXIT - To EXIT to the immediate higher level cate-

gory than the current programming item, press the fixed "HOLD" key.

CLEAR - Press the fixed "CLEAR" key to return the keyset to its idle state.

6. Entering Data and Settings

Protegé 616 software includes two types of data fields. The first type is a "toggle" field. When a toggle field is shown, pressing the "CHG" key will toggle the field between two or more values - the user doesn't actually enter data from the keyboard.

The second type of field is a data entry field. Pressing "CHG" using the softkey at the programming item, clears the field of its current value. The user types the new value using the dial pad of the telephone.

7. Database Records

The Protegé 616 database is the entire collection of option settings and definitions, such as extension numbers, that control how the system operates. The information resides in the KSU and is accessed through the display telephone. Changes that are

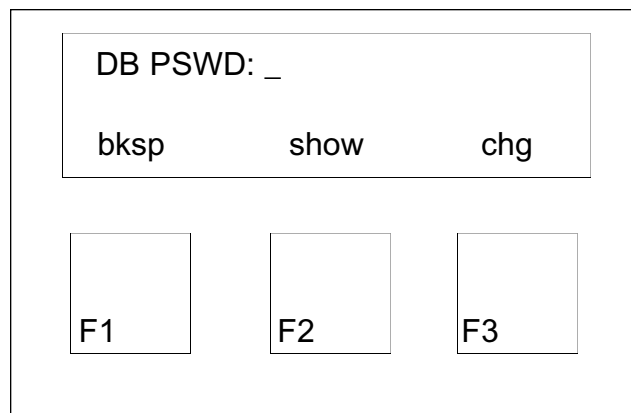


Figure 5-1: Database Password Screen

made will become active immediately once the user exits the database.

8. Rebooting the System

When it is necessary to restart the Protegé 616 system, there are two different methods. One is a System Warm Start that resets the system. The other

is a System Cold Start that resets the system and loads the default settings.

To perform a System Warm Start, enter programming by pressing the Function, #, *. A prompt for the "DB PSWD" will be displayed. Using the dial pad enter "000000" and press the "show" key. Proceed to the "Control" category by pressing the "next" key. When "6. Control" is displayed, press the "show" key. The first item displayed is "Voice Mail." Press the "next" key to move to "SYS WARM START." The system will display the prompt "CHK PSWD." Enter the database password at this time, and press "show." The system will prompt "Are you sure?" On the display will be "yes" or "no."

To perform a System Cold Start, enter programming by pressing the Function, #, *. A prompt for the "DB PSWD" will be displayed. Using the dial pad, enter "000000" and press the "show" key. Proceed to the "Control" category by pressing the "next" key. When "6. Control" is displayed, press the "show" key. The first item displayed is "Voice Mail." Press the "next" key to move to "SYS COLD START." The system will display the prompt "CHK PSWD." Enter the database password at this time, and press "show." The system will prompt "Are you sure?" On the display will be "yes" or "no." Pressing the softkey for "yes" will default the current database.

DATABASE FEATURE PROGRAMMING CATEGORIES

<p>1. Extension</p> <ul style="list-style-type: none"> Show Extension Day Class Night Class Line Assignment Receive Assignment Ring Assignment Ext. Group Location Ext. Position Fun Key Allow Sys Spd Check ICM Mode <p>2. Trunkline</p> <ul style="list-style-type: none"> Show Line VM Gp Ans Dialing Call Abandon Line Type Line Group Private To ICLID <p>3. Call Handling</p> <ul style="list-style-type: none"> Intrusion Intrus. Tone Ex_Hold Time Abandon Time CO Flash Remind Time Pause Time PBX Code PBX Auto Pause Tone Time VM Dialing Ratio Tone Time 	<ul style="list-style-type: none"> Int_Digit Time Recall Time Alt Ring Time SLT Hook_Flash Start End Operator Code Dial Wait Time <p>4. Resource</p> <ul style="list-style-type: none"> System Time Year Month Day Weekday Hour Minute User Names Show Ext. Ext xx: Attendant Alternate Night Switching Monday - Sunday Nite Start Nite End DB Password Premises Message Out for Lunch Be Back Soon Left for the Day In a Meeting Out of Office On Vacation System Speed Dial Speed Num: 	<ul style="list-style-type: none"> (bin information) Line Copy Copy From: Copy To: Extension Copy Copy From: Copy To: KSU Revision Feature Key Copy Copy From: Copy To: <p>5. Restriction</p> <ul style="list-style-type: none"> Dialing Table DGT Interval Extension COS Day Allowed Night Allowed <p>6. Control</p> <ul style="list-style-type: none"> Voice Mail VM Group Member Prefix Code ICM/VM Transfer Busy Fwd. No_Ans Fwd. Direct Fwd. Suffix Code Dis Dgt. Sys Warm Start Chk Password Are you Sure? Sys Cold Start Chk Password Are you Sure? System Type
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Table 5-1: Database Features Programming Categories. The table shows the six programming categories and the features that can be programmed in each of these categories.

9. Database Feature Programming Categories

Note: Only one display set can be in programming at any time. When another display set tries to enter programming simultaneously, a warning message will be received.

The following pages will describe the categories in more detail with information on default settings for all the features.

9.1 Extension - Category 1

This category contains the settings for each extension. Included are:

9.1.1 The Class of Service (COS) for each extension - assigns toll restriction for both day and night modes of operation, permits or denies barge in and Do Not Disturb override.

9.1.2 Line Assignment - line by line access for outgoing calls is permitted or denied for each extension.

9.1.3 Receive Assignment - line by line access to pick up or answer incoming calls.

9.1.4 Ring Assignment - determines by line which extensions ring on incoming calls.

9.1.5 Extension Group - permits extensions to be grouped for the purpose of group call pickup and group paging.

9.1.6 Location - displays the port position of a specified extension.

9.1.7 Extension Position - permits an extension number to be changed to another two-digit number that is not assigned to another extension in the database.

9.1.8 Function Key Usage - permits or denies the use of the function key by the extension.

9.1.9 System Speed Check - determines whether the system checks the Dialing Table in Toll Restriction before allowing an outgoing call initiated via system speed dialing to be completed.

9.1.10 ICM Mode - determines whether an extension is allowed to receive voice announced intercom calls or intercom calls will only ring at the extension.

9.2 Trunkline - Category 2

This category contains the settings for each of the three lines. Included are:

9.2.1 Voice Mail Group Answer - determines when the CO line is programmed to ring the voice mail group for incoming calls on that line.

9.2.2 Dialing Type Selection - allows the selection of either DTMF or pulse dialing.

9.2.3 Call Abandon - allows for loop break supervision.

9.2.4 Line Type Assignment - permits the selection of the line type for each line.

9.2.5 Line Group Assignment - permits extensions to receive, transfer and access lines in a specific group.

9.2.6 Private To - permits a line to be assigned for use by the specified extension only.

9.2.7 ICLID - determines if the system monitors the line for caller ID information on incoming calls.

9.3 Call Handling - Category 3

This category contains the system settings for various functions. Included are:

9.3.1 Intrusion - permits an internal caller to intrude on another extension's call.

9.3.2 Intrusion Tone - enables or disables a tone that is heard by called party when an intrusion is initiated.

9.3.3 Exclusive Hold Time - determines the length of time a call will remain on exclusive hold before it is returned to system hold.

9.3.4 Abandon Time - determines the minimum break length in loop current before the system disconnects the line.

9.3.5 CO Flash - determines the duration of a timed hookflash executed on a CO line.

9.3.6 Remind Time - determines the interval between reminder beeps for calls that are placed on hold.

9.3.7 Pause Time - determines the length of time that the dialing function is paused when waiting for response from the Central Office.

9.3.8 PBX Code - determines the one- or two-digit code that is used to access C.O. dial tone from lines marked as PBX-type trunk lines.

9.3.9 PBX Auto Pause - determines the length of the pause after a PBX access code is dialed.

9.3.10 Tone Time - determines the length of the tone signal being sent to the C.O. line.

9.3.11 Voice Mail Dialing Ratio (including Tone Time & Interval Digit Time) - determine the duration of tones being sent by the system to a voice mail port and the time between digits sent to the voice mail port.

9.3.12 Recall Time - determines the length of time an unanswered call, whether transferred to an unattended extension or placed on hold, will wait before it recalls to and rings at the attendant's extension.

9.3.13 Alternate Ring Time - determines when an unanswered attendant call will ring simultaneously at the specified alternate attendant extension.

9.3.14 SLT Hookflash - determines the window of time a break in loop from a single line device will be recognized by the system as a hookflash.

9.3.15 Operator Code - determines the digit that must be dialed to access the attendant.

9.3.16 Dial Wait Time - determines the length of time the system waits after a line is selected before any digits are dialed on that line.

9.4 Resource - Category 4

This category contains various settings for the system. Included are:

9.4.1 System Time - permits the programming of the day of the week, date, year, month, hour and minute.

9.4.2 User Names - permits the programming of the individual's names for display on keysets.

9.4.3 Attendant - permits the Attendant extension to be changed.

9.4.4 Alternate - permits the programming of an Alternate Attendant extension to be used when a call goes unanswered at the Attendant for a specified length of time.

9.4.5 Night Switching - permits the manual or automatic switching between Day and Night mode.

9.4.6 DB Password - permits the database password to be changed.

9.4.7 Premises Message - permits the editing of the six pre-programmed premise messages.

9.4.8 System Speed Dial - permits the programming of telephone numbers that are frequently dialed.

9.4.9 Line Copy - permits programming of one line and then copying the database parameters to other lines with the same programming status.

9.4.10 Extension Copy - permits programming of one extension and then copying the database parameters to other extensions with the same programming status.

9.4.11 KSU Revision - displays the current system software version.

9.4.12 Feature Key Copy - permits the programming of one extension with the required feature keys and then copying of the feature key programming to all extensions with the same phone type.

9.5 Restriction - Category 5

This category contains the parameters that are used for extension and line dialing restrictions. Included are:

9.5.1 Dialing Table (including Digit Interval and Extension COS) - determines the restrictions (if any) that are placed on extensions for each COS.

9.6 Control - Category 6

This category contains programming information for voice mail operation and the method to perform either a Warm or Cold Start on the system. Included are:

9.6.1 Voice Mail (including Voice Mail Group Member, Prefix Code, Suffix Code and Disconnect Digits) - permits the programming of voice mail ports into a voice mail group and the integration digits that are sent from the KSU to the voice mail port for call handling.

9.6.2 System Warm Start - resets the system.

9.6.3 System Cold Start - resets the system and loads the default settings.

9.6.4 System Type - determines whether the system operates in MF or KF mode.

10. System Parameter Settings

Fixed Time Value Parameters

Item	Time Value
Alarm Clock Alert Ring Duration	1 minute
Message Indication Time for Confirmation or Warning	3 seconds
Call Duration Counter Begins After Last Digit Dialed	10 seconds
Dial Pulse Make/Break	40ms/60ms
Dial Pulse InterDigit Time	600ms
No Answer Call Forward Time	14 seconds
Incoming Line Ringing On Duration	0.8 - 2.4 seconds
Incoming Line Ringing Off Duration	1.6 - 6.4 seconds
Camp on Notification Tone (Burst every 30 seconds)	1 second
Call Again Invoking Time	30 seconds
SLT Hold Recall Ring After Going On-Hook	Depends on Hold Reminder Time. If Hold Reminder Time is set to 0, SLT Hold Recall Ring will be fixed at 30 seconds
Line Camp On Invoking Time	30 seconds
Auto Ring Secondary Attendant After Line Ringing Without Answer	30 seconds

Table 5-2: Fixed Value Parameters.

Fixed or Maximum Length Parameters

Field	Length
Last Number Redial	16 digits
Saved Number Redial	16 digits
Speed Dial Bin Number	16 digits
System Password for DatabasePassword	6 digits
User Name	7 letters
Number Interval in Toll Restriction Table	10 digits
Pre-Programmed Messages	16 letters

Table 5-3: Fixed or Maximum Length Parameters.

Default Database Settings

Category	Feature	Valid Entries	Default
Extension	Show Extension	10 - 17 or 58 - 65*	N/A
	Day COS	0 - 7	0
	Night COS	0 - 7	0
	Line Assignment	Y or N	Y
	Receive Assignment	Y or N	Y
	Ring Assignment	Y or N	Y
	Extension Group	1 - 4	1
	Location	N/A	Displays extension port position
	Extension Position	10 - 17 or 58 - 65*	Port 1 = 10, port 2 = 11, etc.
	Function Key Usage	Y or N	Y
	System SPD Check	Y or N	Y
	ICM Mode	Ring or Page	Page
	Trunkline	Show Line	1 - 3
Voice Mail Group Answer		Never/Day/Night/Always	Never
Dialing		Tone or Pulse	Tone
Call Abandon		Y or N	Y
Line Type		CO/PBX/Page/Empty	CO
Line Group		1 or 2	1
Private To		Null or valid extension	Null
ICLID		Y or N	N
Call Handling	Intrusion	Y or N	N
	Intrusion Tone	Y or N	Y
	Exclusive Hold Time	0 - 8 minutes	0
	Abandon Time	50 - 1500 ms	600
	CO Flash	0.1 - 3.0 seconds	0.7
	Remind Time	0 - 90 seconds	30
	Pause Time	1.5 - 5.0 seconds	1.5
	PBX Code	0 - 9 or 00 - 99	9
	PBX Auto Pause	1 - 9 seconds	2
	Tone Time	70 - 120 ms	70
	VM Dialing Ratio - Tone Time	60 - 150 ms	90
	VM Dialing Ratio - Int_Dgt Time	60 - 150 ms	90
	Recall Time	10 - 120 seconds	30
	Alt. Ring Time	10 - 60 seconds	30
	SLT Hookflash - Start	60 - 1400 ms	200
	SLT Hookflash - End	300 - 1500 ms	1500
	Operator Code	0 or 9	0
Dial Wait Time	0 - 8	1	
Resource	System Time	Any valid hour, minute, weekday, month, day, year	12:01 a.m., Fri., Jan. 1, 1999
	User Names	Attendant programmable	Empty
	Attendant	10 - 17 or 58 - 65*	10
	Alternate	Null, 10 - 17 or 58 - 65*	Null
	Night Switching	Programmable time for Night Mode for all 7 days	Day
	Database Password	Combination of 6 digits	000000
	Premises Message	16 characters maximum	Six pre-programmed
	System Speed Number	0 - 9, #, *, pause = "F70," flash = "F3," "Flnn"	Empty

Default Database Settings (cont'd)

Category	Feature	Valid Entries	Default
Resource (cont'd)			
	Line Copy	Any line	None
	Extension Copy	Any extension	None
	Dial Wait Time	0 - 8 seconds	1
	KSU Revision	N/A	N/A
	Feature Key Copy	Any extension with feature key programming	None
Restriction			
	Dialing Table - Digit Interval	100 number intervals	1st interval - 0, # 2 -100 intervals - Null
Control			
	Voice Mail Group Member	Any valid voice mail extension number	Empty
	Voice Mail - Prefix Code	4 digit maximum	ICM/VM - 12 Transfer - 11 Busy Fwd - 11 No_Ans - 11 Direct Fwd - 11
	Suffix Code	2 digits maximum	Null
	Disconnect Digits	8 digits maximum	*****
	System Warm Start	N/A	N/A
	System Cold Start	N/A	N/A
	System Type	MF or KF	MF

Table 5-4: Default Settings

*Extension numbers 58 - 65 are only valid if using the B2 channel of a port.

11. Enter Database Programming

To begin customizing the database, have an idle business display phone available for programming. From the idle keyset, enter the programming interface by pressing the key combination of Function, #, *. If successful the following screen will be displayed:

DB PSWD: _

bksp show chg

F1

F2

F3

Figure 5-2: Password entry screen for Database Programming.

Enter the password and press the F2 softkey to access the programming screens. At default the database password is "000000." Remember to change the password often to a unique number to avoid access to the database by unauthorized personnel. To change a password, see "4. Resource, DB Password." The new password should be written down and stored in a safe place.

Category 1 - Extension

11.1 - Extension - To view programming for an extension, press the F3 key "Show." Enter the extension number you want and press the F2 key "Show."

Note: If the extension number does not exist, it will be rejected.

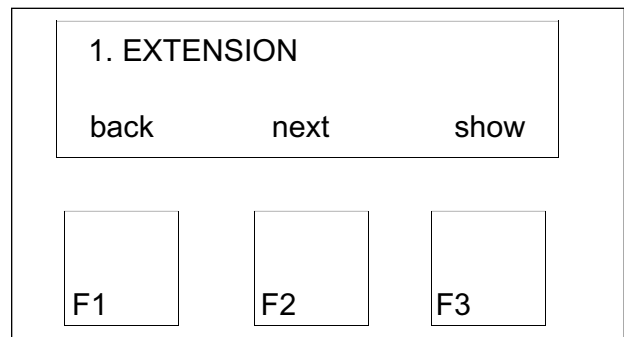


Figure 5-3: Extension Screen

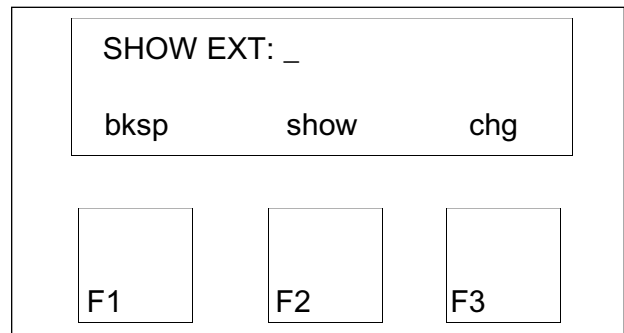


Figure 5-4: Show Extension Screen

Category 1 - Extension - Class of Service (COS)

11.1.1 - Extension - Class of Service (COS) - Protegé® 616 displays the Class of Service information about the extension first. By using the softkeys, Day and Night COS can be changed.

- For this system the class of service of "0" restricts none of the associated features from this extension. These features include toll restriction, call intrusion and DND override.
- The 616 system service mode determines whether the day or night class of service of the extension will be active.

Default: All extensions have "0" as their day and night COS.

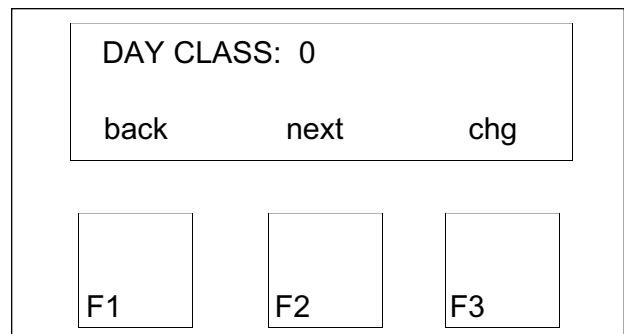


Figure 5-5: Day Class of Service

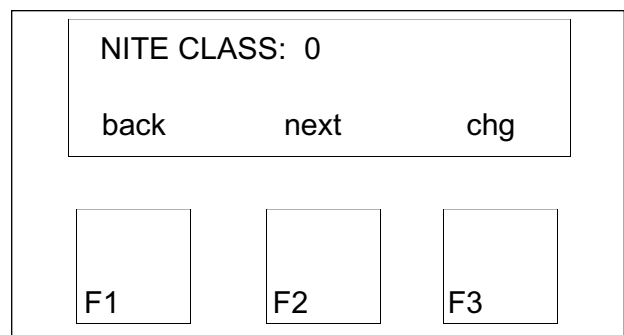


Figure 5-6: Night Class of Service

Category 1 - Extension - Flexible Line Assignment

11.1.2 - Extension - Flexible Line Assignment - To give the extension access, or limit access, to lines, press the F3, "Show" key.

Each available CO line has a programming screen. The F3 softkey, "Chg," acts as a toggle between "Y" and "N." Enter "Y" if the extension should have access to that specific line. Or, "N" if the extension should not have access to the line.

- If an extension is permitted access to a particular line, extension users can use an individual line or line group key to access idle lines or to answer an incoming or held call on a specific line.
- Extension users may assign an individual or line group key to a feature key.
- The Private Trunk Assignment is removed when the Line Assignment is updated.

Default: All lines are accessible to all extensions.

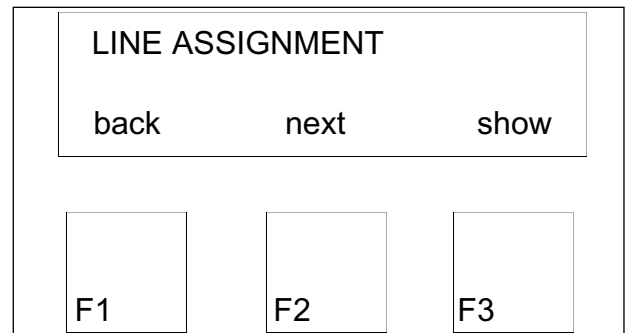


Figure 5-7: Line Assignment Screen

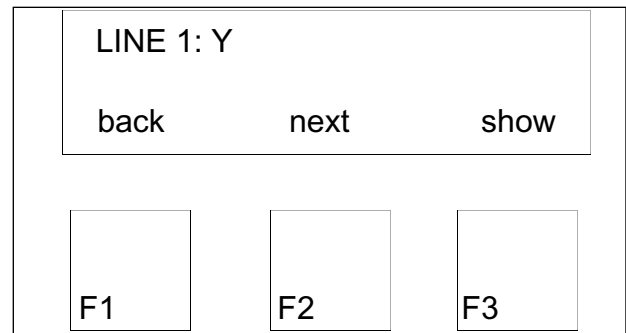


Figure 5-8: Individual Line Assignment Screen

Category 1 - Extension - Receive Assignment

11.1.3 - Extension - Receive Assignment - To permit, or prohibit, an extension to answer an actively ringing line, press the F3, "Show" key.

Each available CO line has a programming screen. The F3 softkey, "Chg," acts as a toggle between "Y" and "N." Enter "Y" if the extension is permitted to answer the actively ringing line. Or, "N" if the extension is prohibited to answer the line.

Default: All line calls can be answered by all extensions while signaling.

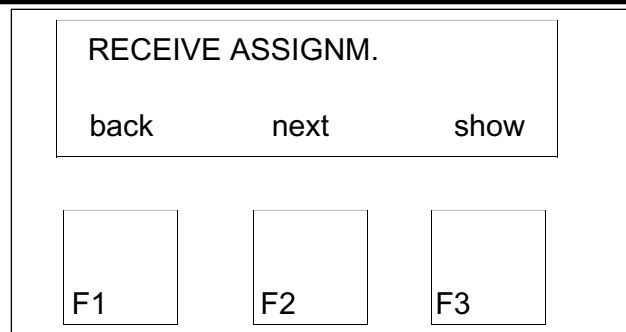


Figure 5-9: Receive Assignment Screen

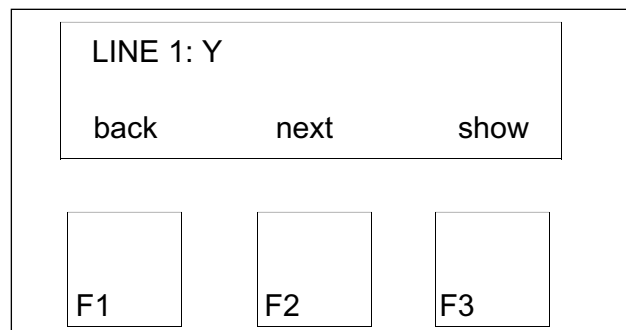


Figure 5-10: Individual Receive Assignment Screen

Category 1 - Extension - Ring Assignment

11.1.4 - Extension - Ring Assignment - To determine which extensions ring when an incoming call is signaling, press the F3, "Show" key.

Each available CO line has a programming screen. The F3 softkey, "Chg," acts as a toggle between "Y" and "N." Enter "Y" if the line is to ring at that extension. Or, "N" if the line is prohibited from ringing at the extension.

It is important to program both the Day and Night Mode line information. The Ring Assignment follows the system service mode. If the service mode is "Day" then the system checks the Ring Assignment/Day Mode programming to determine whether an incoming line should ring at an extension.

Default: In Day mode all extensions ring when incoming line calls are signaling. In Night mode only extension 10 rings when incoming line calls are signaling.

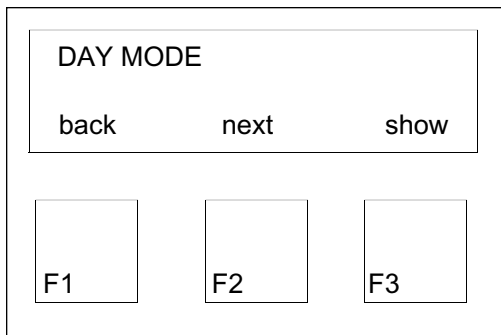


Figure 5-13: Ring Assignment Day Mode Screen

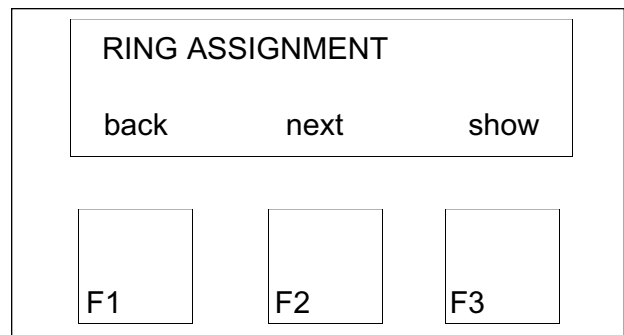


Figure 5-11: Ring Assignment Screen

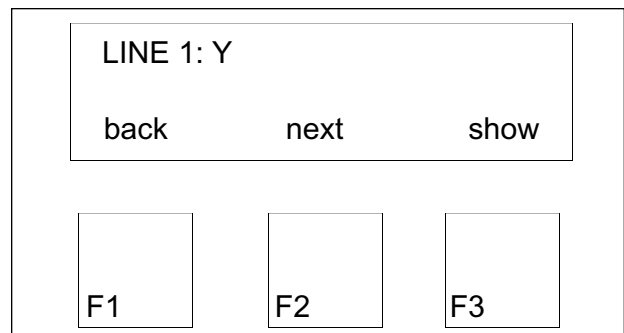


Figure 5-12: Individual Ring Assignment Screen

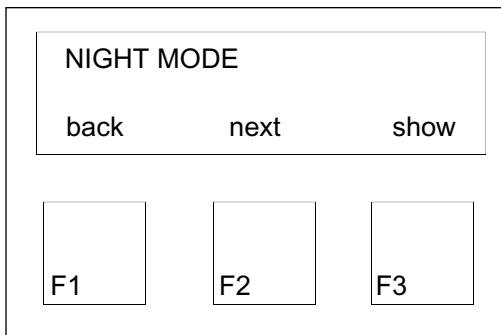


Figure 5-14: Ring Assignment Night Mode Screen

Category 1 - Extension - Extension Group

11.1.5 - Extension - Extension Group - To specify which extension group an extension belongs, press the F3 softkey, "Chg". Assigning extensions to extension groups allows for efficient use of the group call pickup feature and group paging. The system allows a maximum of four extension groups.

Default: All extensions belong to extension group 1.

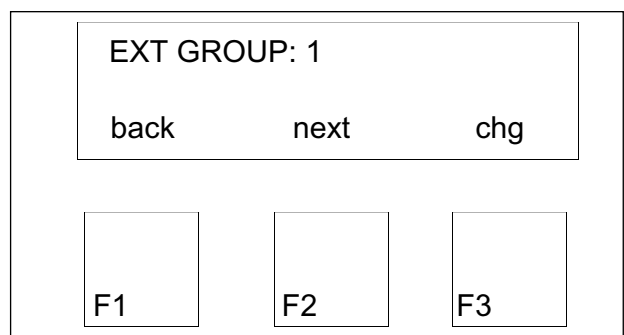


Figure 5-15: Extension Group Screen

Category 1 - Extension - Location

11.1.6 - Extension - Location - This is an informational field that displays the physical port location of each extension on the female 25 pair connector.

LOCATION: 1-01

back next

F1 F2 F3

Figure 5-16: Extension Location Screen

Category 1 - Extension - Extension Position

11.1.7 - Extension - Extension Position - To change an extension number to an unassigned two-digit number, press the F3 softkey, "Chg," and enter the new extension number.

Default: The system extension numbers are 10 to 17 in order of their port position. If an analog adapter is connected, the extensions using the B2 channel are numbered from 58 to 65.

EXT POSITION: 10

back next chg

F1 F2 F3

Figure 5-17: Extension Position Screen

Category 1 - Extension - Function Key Allow

11.1.8 - Extension - Function Key Allow - To permit or prohibit the use of features available by using the Function key on an extension, press the F3 softkey, "Chg," to toggle between "Yes" and "No."

If the Function key is disabled, then if it is pressed on a digital keyset the system will not take any action. This would cause all feature access codes to be prohibited. An exception to this would be the features, Speed Dialing, Specific Line Access and Call Park.

The same is true for a single line telephone. If Function Key Allow is set to No the "#" is disabled.

Default: Function key is allowed for all extensions.

FUN KEY ALLOW: Y

back next chg

F1 F2 F3

Figure 5-18: Function Key Allow Screen

Category 1 - Extension - System Speed Check

11.1.9 - Extension - System Speed Check - To permit or prohibit Protegé[®] 616 the ability to check all outgoing calls that were dialed using system speed numbers against the Toll Restriction table, press the F3 softkey, "Chg," to toggle between "Yes" and "No."

Default: System Speed Check is enabled on all extensions.

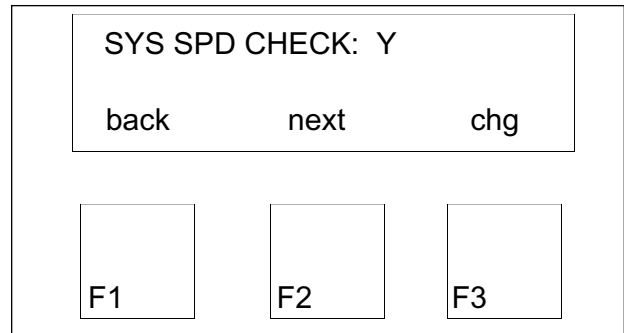


Figure 5-19: System Speed Check Screen

Category 1 - Extension - ICM Mode

11.1.10 - Extension - ICM Mode - There are two settings for the ICM Mode, ring and page. If set to ring, when an intercom call is placed to an extension, the extension will always ring to alert the user to the intercom call regardless of the voice call allow (F98) feature. If set to page, the extension user is allowed to receive intercom calls by voice announcement or by ringing dependent upon the status of the voice call allow feature. To toggle between "Ring" and "Page," press the F3 softkey, "Chg."

Default: All extensions are allowed to receive a voice announcement when intercom calls are placed.

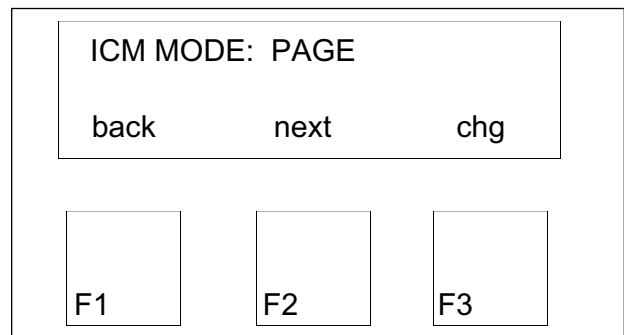


Figure 5-20: ICM Mode Screen

Category 2 - Trunkline

11.2 - Trunkline - To view programming for each line, press the F3 key "Show."

Enter the line number you want and press the F2 key "Show."

Note: If the line number does not exist it will not be accepted.

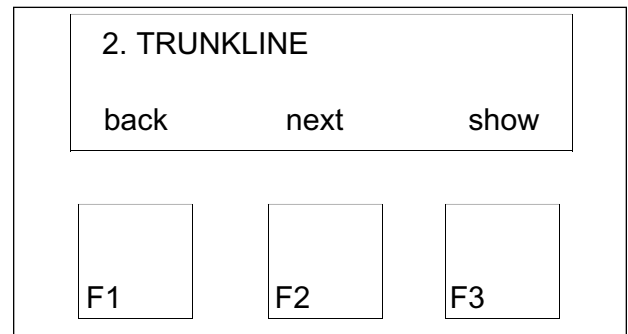


Figure 5-21: Trunkline Screen

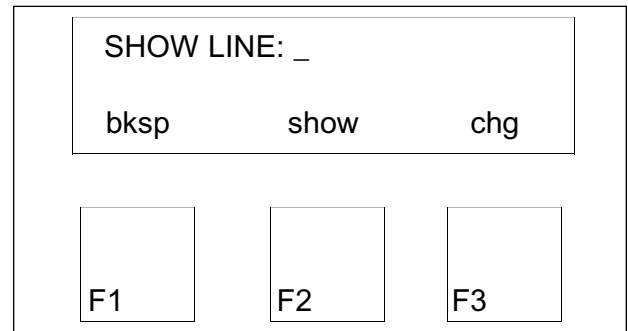


Figure 5-22: Show Line Screen

Category 2 - Trunkline - Voice Mail Group Answer

11.2.1 - Trunkline - Voice Mail Group Answer - Calls can be permitted or prohibited from directly ringing to a voice mail system. The choices "Never," "Always," "Day" and "Night" can be made by pressing the F3 softkey, "Chg." This key acts as a toggle between the four choices.

This programming overrides Extension Ring Assignment and Trunkline Private To programming when the Voice Mail Group Answer is active. Note: Activating Voice Mail Answer Group does not affect the Extension Receive Assignment or Call Pick Up feature.

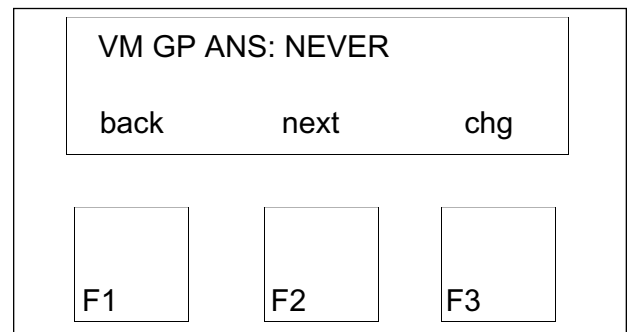


Figure 5-23: Voice Mail Group Answer Screen

Default: All lines are programmed to Never.

Category 2 - Trunkline - Dialing

11.2.2 - Trunkline - Dialing - To program each line to either "Tone" (DTMF) or "Pulse," press the F3 softkey, "Chg."

- For lines that are programmed as pulse, pressing the "*" prior to dialing converts from pulse to tone.
- If lines are programmed as pulse, the character "#" is not allowed.

Default: The dialing type is Tone for all lines.

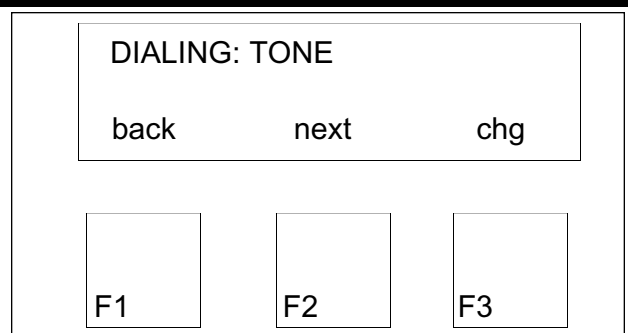


Figure 5-24: Dialing Screen

Category 2 - Trunkline - Call Abandon

11.2.3 - Trunkline - Call Abandon - If this function is enabled, the system monitors for disconnect supervision from the Central Office. When Call Abandon is set to "Y," the system monitors for an open in loop current longer in duration than the Abandon Time (see Call Handling). To enable or disable monitoring of loop current, press the F3 softkey, "Chg," to toggle between "Yes" and "No."

Default: Call Abandon is enabled.

CALL ABANDON: Y

back next chg

F1 F2 F3

Figure 5-25: Call Abandon Screen

Category 2 - Trunkline - Line Type

11.2.4 - Trunkline - Line Type - Assign each CO line the correct line type. The choices, "CO," "PBX," "Page" and "Empty," can be made by pressing the F3 softkey, "Chg." This key acts as a toggle between the four choices.

- Most lines will be assigned as CO type.
- If the 616 is connected behind a PBX system or using CENTREX, then the lines will be marked as PBX type. Note: Don't forget to designate the PBX Code in Category 3 - Call Handling.
- If a line is assigned as a Page type, then the line cannot be put on hold or be a member of a conference.
- If a line is assigned as Empty, then the line cannot be used.

LINE TYPE: CO

back next chg

F1 F2 F3

Figure 5-26: Line Type Screen

Default: All lines are marked as CO.

Category 2 - Trunkline - Line Group

11.2.5 - Trunkline - Line Group -Two line groups are provided by the system for assignment of specific lines. To specify to which group a line belongs, press F3, "Chg," to toggle between groups one and two.

The Line Group assignment is used for Line Pool access.

Default: All lines are assigned to group one.

LINE GROUP: 1

back next chg

F1 F2 F3

Figure 5-27: Line Group Screen

Category 2 - Trunkline - Private To

11.2.6 - Trunkline - Private To - To allow a specific line to be used exclusively by an extension, press the F3 softkey, "Chg," to enter a valid two-digit extension number. If the extension does not exist, then the system does not allow its number to be entered.

- When a line is assigned to a specific extension, the status of the line, receive and ring assignment will be automatically updated.
- If the "Private To" designation is removed, the line will be accessible to all extensions that belong to the same extension group as the specific extension.

Default: No lines are assigned to "Private To."

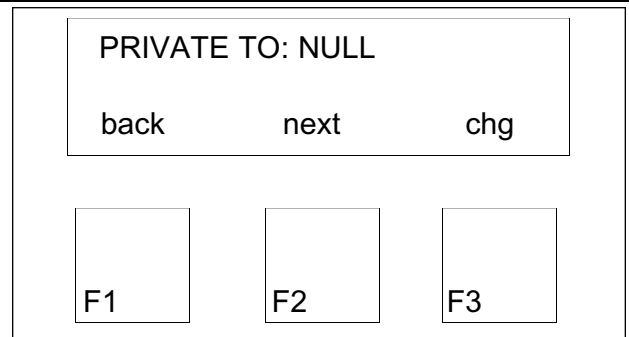


Figure 5-28: Private To Screen

Category 2 - Trunkline - ICLID

11.2.7 - Trunkline - ICLID - Each line can be assigned to detect incoming caller ID information if delivered from the central office. To enable or disable ICLID detection for the C.O. line press the F3 softkey, "Chg," to toggle between "Yes" and "No."

Default: ICLID is disabled for all lines.

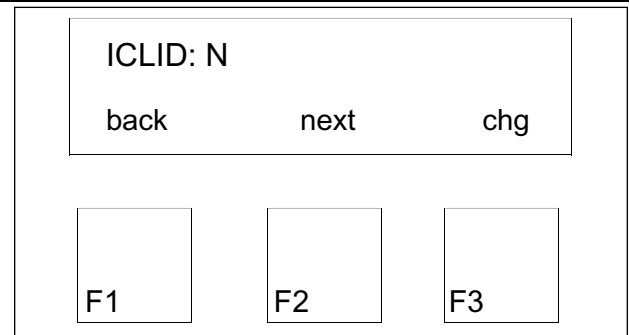


Figure 5-29: ICLID Screen

Category 3 - Call Handling

11.3 - Call Handling - To view Call Handling programming, press the F3 key "Show."

3. CALL HANDLING

back next show

F1 F2 F3

Figure 5-30: Call Handling Screen

Category 3 - Call Handling - Intrusion

11.3.1 - Call Handling - Intrusion - Intrusion, if permitted, allows a party to join a call on a CO line occupied by an extension with the same or a lower Class of Service. The setting of "Y" permits intrusion on a line and extension basis. To disable intrusion from any extension, press the F3 softkey, "Chg," and toggle to "N."

- A party who intrudes on a call may talk with all people on the line.
- If enabled an intrusion tone will be heard by the extension.

Default: System intrusion is disabled.

INTRUSION: N

back next chg

F1 F2 F3

Figure 5-31: Intrusion Screen

Category 3 - Call Handling - Intrusion Tone

11.3.2 - Call Handling - Intrusion Tone - The intrusion tone, when enabled, alerts the extension user that another party is entering into the conversation. The setting of "Y" enables the intrusion tone. To disable the tone, press the F3 softkey, "Chg," and toggle to "N."

Default: The intrusion tone is enabled.

INTRUS. TONE: Y

back next chg

F1 F2 F3

Figure 5-32: Intrusion Tone Screen

Category 3 - Call Handling - Exclusive Hold

11.3.3 - Call Handling - Exclusive Hold - Line calls that are placed on Exclusive Hold will be returned to system hold after the programmed time in this field expires. To enter programming in this field, press the F3 softkey, "Chg," and enter 0-8 minutes. By entering 0, Exclusive Hold is disabled.

Default: Exclusive Hold is set at 0.

The screenshot shows a rectangular box containing the text "EX_HOLD TIME: 0". Below this text are three buttons labeled "back", "next", and "chg". At the bottom of the box are three softkey buttons labeled "F1", "F2", and "F3".

Figure 5-33: Exclusive Hold Screen

Category 3 - Call Handling - Abandon Time

11.3.4 - Call Handling - Abandon Time - Establishes the minimum duration of open that the Central Office must produce for the system to recognize disconnect supervision. The timer range is 50 to 1500ms.

Default: Abandon Time is set at 600ms.

The screenshot shows a rectangular box containing the text "ABANDON TIM: 600". Below this text are three buttons labeled "back", "next", and "chg". At the bottom of the box are three softkey buttons labeled "F1", "F2", and "F3".

Figure 5-34: Abandon Time Screen

Category 3 - Call Handling - CO Flash

11.3.5 - Call Handling - CO Flash - The CO flash specifies the duration of a hookflash generated by the system to the public network. The duration ranges between 0.1 to 3.0 seconds. Press the F3 softkey, "Chg," to enter the new setting.

Default: The CO flash time is set at 0.7 seconds.

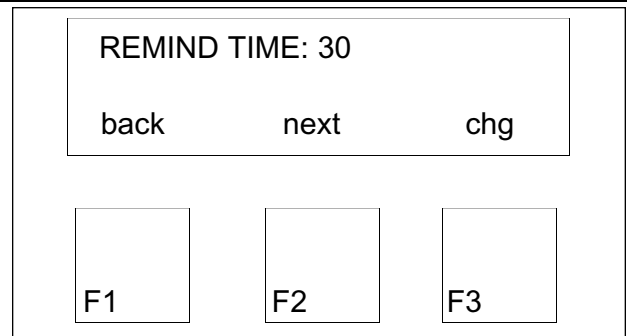
The screenshot shows a rectangular box containing the text "CO FLASH: 0.7". Below this text are three buttons labeled "back", "next", and "chg". At the bottom of the box are three softkey buttons labeled "F1", "F2", and "F3".

Figure 5-35: CO Flash Screen

Category 3 - Call Handling - Remind Time

11.3.6 - Call Handling - Remind Time - The Remind Time allows the system to produce a beep at scheduled intervals to alert the extension user that an intercom or line call is placed on hold. The range of valid entries is 0 - 10 - 30 - 60 - 90 seconds. A setting of 0 disables the reminder tone. Press the F3 softkey, "Chg," to enter the new setting.

Default: The Remind Time beep occurs every 30 seconds.



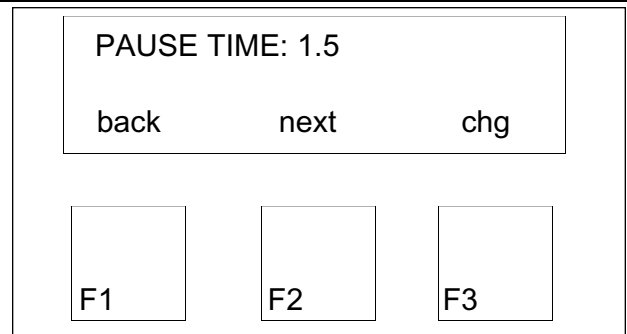
The screen displays "REMIND TIME: 30" at the top. Below this, there are three softkeys: "back", "next", and "chg". At the bottom of the screen, there are three function key indicators: "F1", "F2", and "F3".

Figure 5-36: Remind Time Screen

Category 3 - Call Handling - Pause Time

11.3.7 - Call Handling - Pause Time - For applications, such as speed dial number, a pause can be inserted to intentionally delay the dialing of digits on outgoing CO line calls. By pressing the F3 softkey, "Chg," the pause time may be entered. The range of valid entries is 1.5 - 2.0 - 3.5 - 5.0 seconds.

Default: The pause time is 1.5 seconds.



The screen displays "PAUSE TIME: 1.5" at the top. Below this, there are three softkeys: "back", "next", and "chg". At the bottom of the screen, there are three function key indicators: "F1", "F2", and "F3".

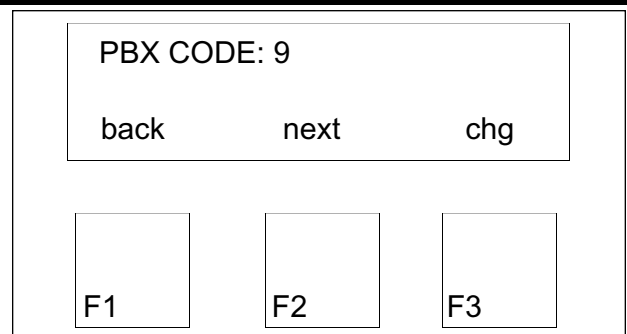
Figure 5-37: Pause Time Screen

Category 3 - Call Handling - PBX Code

11.3.8 - Call Handling - PBX Code - This field specifies the PBX code for access to the lines. The access code can be either one or two digits in length with 0-9 and 00-99 being valid entries. To change the current entry, press the F3 softkey, "Chg," and enter the new access code.

- After the PBX code is dialed, a fixed pause time of two seconds is automatically inserted to allow time for connection with the central office. Dialing continues after the one second pause. The PBX code is also ignored by the system when checking toll restriction for the number dialed by the extension.
- For PBX lines, toll restriction tables are checked only after a PBX Code is entered. If dialing does not begin with PBX code, toll restriction tables are not checked.

Default: The PBX code is 9.



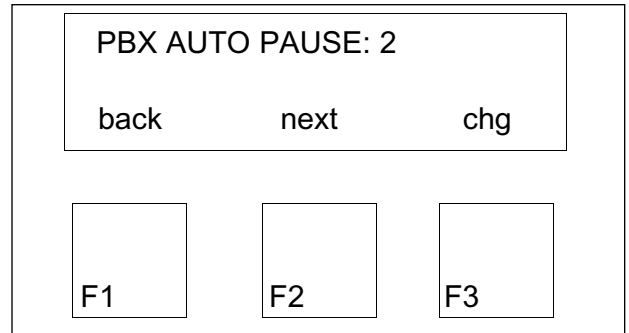
The screen displays "PBX CODE: 9" at the top. Below this, there are three softkeys: "back", "next", and "chg". At the bottom of the screen, there are three function key indicators: "F1", "F2", and "F3".

Figure 5-38: PBX Code Screen

Category 3 - Call Handling - PBX Auto Pause

11.3.9 - Call Handling - PBX Auto Pause - To shorten or extend the automatic pause that is inserted after a PBX code is entered, press the F3 softkey, "Chg.," and then enter a time between 1 and 9 seconds.

Default: The pause time is two seconds.



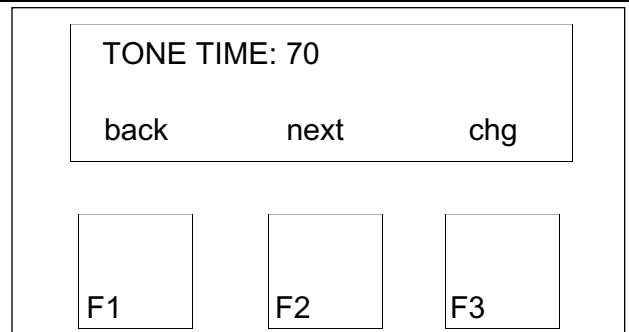
The screen displays the text "PBX AUTO PAUSE: 2" at the top. Below this, there are three softkey options: "back", "next", and "chg". At the bottom of the screen, there are three function key indicators: "F1", "F2", and "F3".

Figure 5-39: PBX Auto Pause Screen

Category 3 - Call Handling - Tone Duration

11.3.10 - Call Handling - Tone Duration - This field determines the length of the tones the 616 system is sending to the central office. To change the time, press F3 softkey, "Chg.," and enter the number of milliseconds desired. The range of valid entries is 70 - 90 - 120 milliseconds.

Default: The tone signal is 70ms in length.

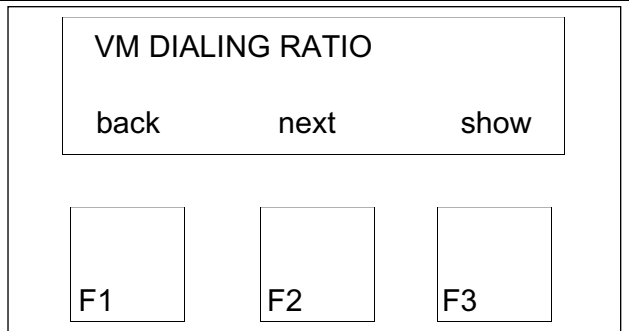


The screen displays the text "TONE TIME: 70" at the top. Below this, there are three softkey options: "back", "next", and "chg". At the bottom of the screen, there are three function key indicators: "F1", "F2", and "F3".

Figure 5-40: Tone Duration Screen

Category 3 - Call Handling - Voice Mail Dialing Ratio

11.3.11 - Call Handling - Voice Mail Dialing Ratio - If a voice mail system is connected to the system, two fields under Voice Mail Dialing Ratio need to be programmed. To proceed with programming the Tone Time and Interval Digit Time, press the F3 softkey, "Chg."



The screen displays the text "VM DIALING RATIO" at the top. Below this, there are three softkey options: "back", "next", and "show". At the bottom of the screen, there are three function key indicators: "F1", "F2", and "F3".

Figure 5-41: Voice Mail Dialing Ratio Screen

Category 3 - Call Handling - Voice Mail Dialing Ratio

11.3.11.1 - Call Handling - Voice Mail Dialing Ratio - Tone Time - This field determines the length of a tone that is being sent by the 616 system to voice mail. The range of valid entries is 60 - 90 - 120 - 150 milliseconds programmable in 30 millisecond increments. To change the value, press the F3 softkey, "Chg," and enter the valid entry.

Default: The length of tone is 90ms.

TONE TIME: 90

back next chg

F1 F2 F3

Figure 5-42: Voice Mail Dialing Ratio Tone Time Screen

Category 3 - Call Handling - Voice Mail Dialing Ratio

11.3.11.2 - Call Handling - Voice Mail Dialing Ratio - Int_Dgt Time - This field determines the interval between tones by the 616 system to a voice mail port. The range of valid entries is 60 - 90 - 120 - 150 milliseconds programmable in 30 millisecond increments. To change the value, press the F3 softkey, "Chg," and enter the valid entry.

Default: The interval between tones is 90ms.

INT_DGT TIME: 90

back next chg

F1 F2 F3

Figure 5-43: Voice Mail Dialing Ratio Int_Dgt Time Screen

Category 3 - Call Handling - Recall Time

11.3.12 - Call Handling - Recall Time - This field is specific to call transfer and call park. It determines the length of time a call will ring unanswered at an extension before the call will ring at the attendant or specified extensions for a line. It also determines the length of time a call is parked on an extension number. The range of valid entries is 10 - 16 - 30 - 60 - 90 - 120.

Default: The recall time is 30 seconds.

RECALL TIME: 30

back next chg

F1 F2 F3

Figure 5-44: Recall Time Screen

Category 3 - Call Handling - Alternate Ring Time

11.3.13 - Call Handling - Alternate Ring Time - To determine the time a call will ring at the attendant's station before it simultaneously rings at the alternate attendant's station, press the F3 softkey, "Chg.," and enter the new time. The range of valid entries is 10 - 20 - 30 - 40 - 50 - 60 seconds.

Default: The alternate ring time is 30 seconds.

ALT_RING TIME: 30

back next chg

F1 F2 F3

Figure 5-45: Alternate Ring Time Screen

Category 3 - Call Handling - SLT Hookflash

11.3.14 - Call Handling - SLT Hookflash - To program the lower and upper recognition window for a hookflash from a single line telephone, press the F3 softkey, "Show," to enter the programming.

START: 200

back next chg

F1 F2 F3

Figure 5-47: SLT Hookflash Start Screen

The "Start" field determines the minimum valid hookflash duration for a single line telephone. A hookflash that is shorter than the value will be ignored by the system. This number is always less than the End Time. The range of valid entries is 60 - 100 - 200 - 300 - 400 - 500 - 600 - 700 - 800 - 900 - 1000 - 1100 - 1200 - 1300 - 1400 milliseconds.

Default: The default minimum duration is 200ms.

SLT HOOK_FLASH

back next show

F1 F2 F3

Figure 5-46: SLT Hookflash Screen

END: 800

back next chg

F1 F2 F3

Figure 5-48: SLT Hookflash End Screen

The "End" field establishes the maximum valid hookflash duration for a single line telephone. A hookflash that is longer than this time will register as on-hook and cause a disconnect. This number is always greater than the Start Time. The range of valid entries is 100 - 200 - 300 - 400 - 500 - 600 - 700 - 800 - 900 - 1000 - 1100 - 1200 - 1300 - 1400 - 1500 milliseconds.

Default: The default maximum duration is 800.

Category 3 - Call Handling - Operator Code

11.3.15 - Call Handling - Operator Code - This field determines what digit is dialed by internal and external callers to contact the operator. Valid entries are 0 and 9. To change press the F3 softkey, "Chg." This softkey acts as a toggle between the two valid entries. Note: The Operator Code and the PBX Code cannot be set to the same number. If the operator code is set to 9, then the PBX code has to be 0.

Default: The access code is 0.

The screenshot shows a rectangular window with a title bar that reads "OPERATOR CODE: 0". Below the title bar, there are three softkeys: "back", "next", and "chg". At the bottom of the window, there are three function keys labeled "F1", "F2", and "F3".

Figure 5-49: Operator Code Screen

Category 3 - Call Handling - Dial Wait Time

11.3.16 - Call Handling - Dial Wait Time - Press the F3 softkey, "Chg," if the Dial Wait Time needs to be changed. The allowable entries are 0 - 8 seconds. This field is used when the system does not detect dial tone for any outgoing calls. The digits will be dialed after the programmed Dial Wait Time expires.

Default: The Dial Wait Time is one second.

The screenshot shows a rectangular window with a title bar that reads "DIAL WAIT TIME: 1". Below the title bar, there are three softkeys: "back", "next", and "chg". At the bottom of the window, there are three function keys labeled "F1", "F2", and "F3".

Figure 5-50: Dial Wait Time Screen

Category 4 - Resource

11.4 - Resource - To view Resource programming, press the F3 key "Show."

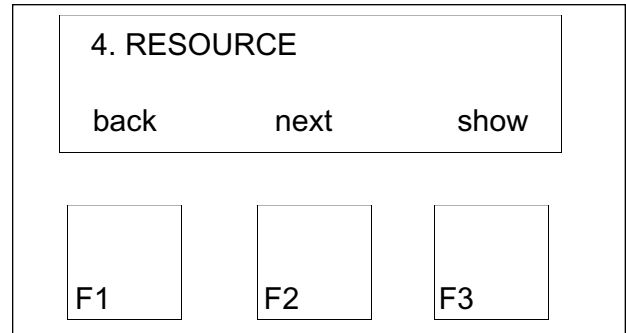


Figure 5-51: Resource Screen

Category 4 - Resource - System Time

11.4.1 - Resource - System Time - To change the system's internal clock, including the year, month, date, weekday, hour and minute, press the F3 softkey, "Show."

Press the F3 softkey, "Chg.," to enter a different month or weekday. After the field is cleared, the F2 softkey assumes the function of a "Save" key. Enter the new month and press the F2 softkey.

Press the F3 softkey, "Chg.," to enter the year, date, hour or minute. After the field is cleared, the F2 softkey assumes the function of a "Save" key. Enter the new date and press the F2 softkey.

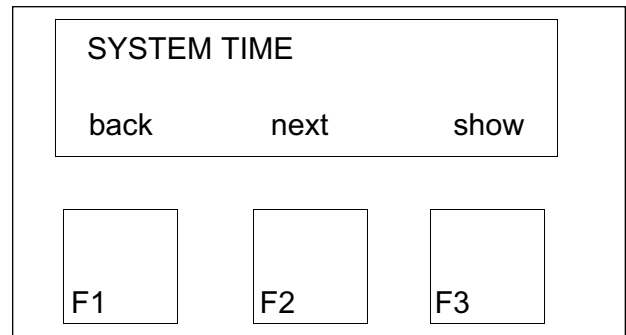


Figure 5-52: System Time Screen

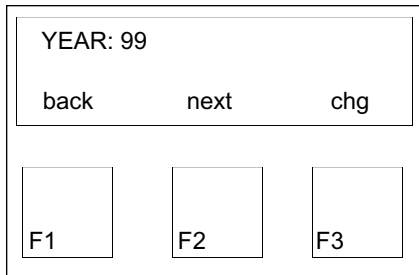


Figure 5-53: System Time Year Screen

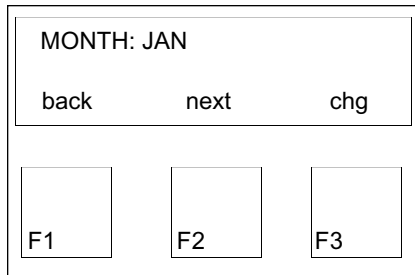


Figure 5-54: System Time Month Screen

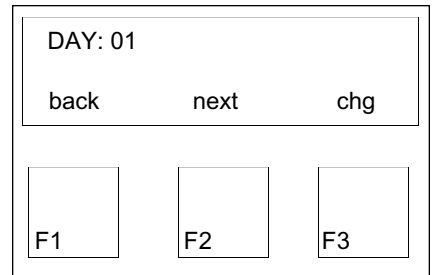


Figure 5-55: System Time Day Screen

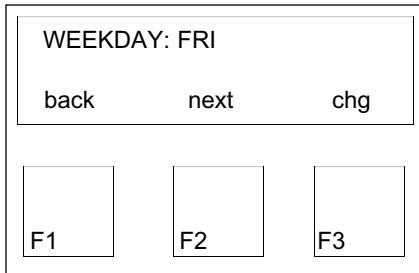


Figure 5-56: System Time Weekday Screen

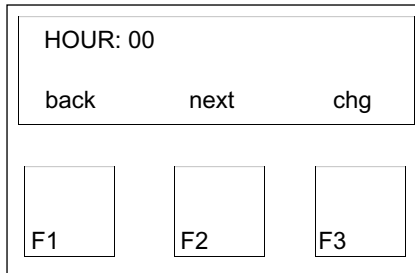


Figure 5-57: System Time Hour Screen

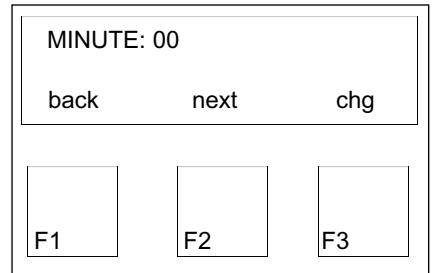


Figure 5-58: System Time Minute Screen

Category 4 - Resource - User Names

11.4.2 - Resource - User Names - To view or program user names for active extensions on the 616 system, press the F3 softkey, "Show."

Press the F3 softkey, "Chg," and enter a valid extension number. If no name has been entered, the display will read "Empty." Press the F3 softkey, "Chg," and use the dialpad to enter a seven-character name.

- Press the " # " key to move the cursor one space.
- Use the 0 key to enter the letters Q, Z, period and the numeral 0.
- Press 0 once for Q, twice for Z, three times for a period and four times for 0.
- The letters are entered as uppercase.
- Use the 1 key to enter a comma, dash, ampersand or the numeral 1.
- Press 1 once for comma, twice for dash, three times for ampersand and four times for 1.

Default: The user name is empty.

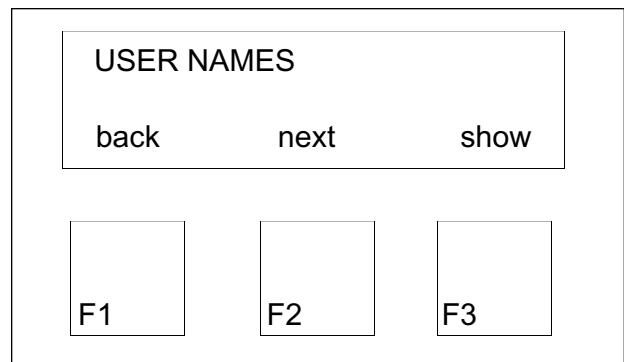


Figure 5-59: User Names Screen

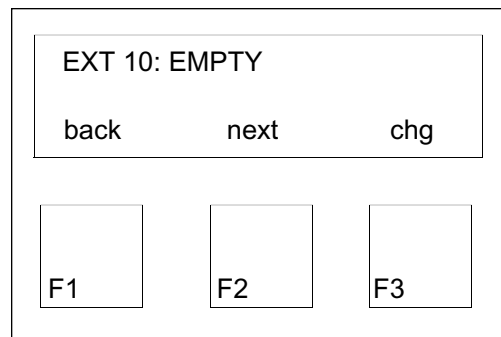


Figure 5-60: User Name Programming Screen

Category 4 - Resource - Attendant

11.4.3 - Resource - Attendant - To designate the extension number for the attendant, press the F3 softkey, "Chg," and enter a valid extension number.

- Normally, all transferred calls that are unanswered when the Recall Timer expires recall to the attendant.
- A system must have an extension designated as an attendant.
- When the attendant is changed, the attendant programming of Line, Receive and Ring Assignment have to be programmed for the new attendant.
- An attendant cannot be assigned to a single line telephone.

Default: The attendant is extension 10.

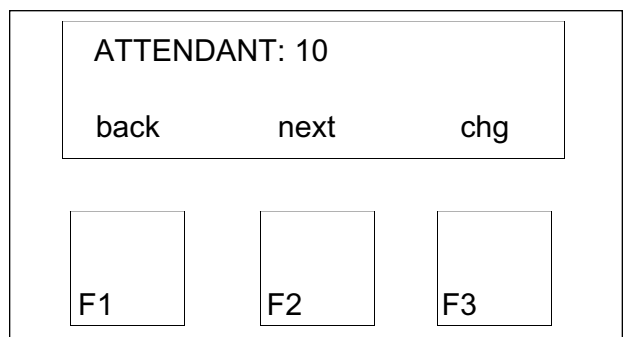


Figure 5-61: Attendant Screen

Category 4 - Resource - Alternate Attendant

11.4.4 - Resource - Alternate Attendant - To program a second extension to be an alternate ringing site for incoming calls that are not answered by the attendant in 30 seconds, press the F3 softkey, "Chg," and enter an extension number. Only extensions that are programmed on the system can be designated as an alternate attendant.

Default: There is no alternate attendant.

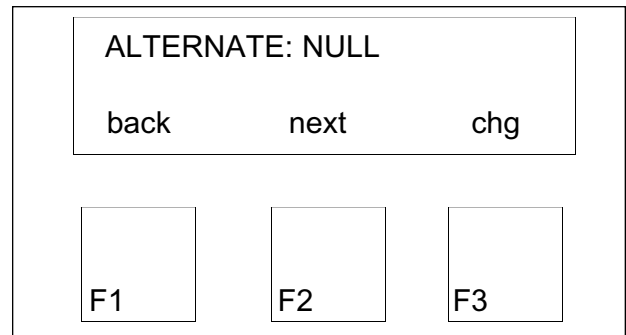


Figure 5-62: Alternate Attendant Screen

Category 4 - Resource - Night Switching

11.4.5 - Resource - Night Switching - To program the time of day by day of week for the system to automatically switch between Day and Night Modes, press the F3 softkey, "Show."

Press the F2 softkey, "Next," until the correct day is displayed. Once the day is correct, press the F3 softkey, "Show."

For each day the Start and End times must be programmed. Use the F3 softkey, "Chg," to enter the time in the field. Once the information is entered, the Service Mode must be changed to Time for the programming to take affect.

Note: If the attendant forces the system into Night Mode using F63 the automatic switching mode is disabled. To return to automatic switching, the attendant has to access F#0 and change the service mode to Time.

Default: System is in day service mode.

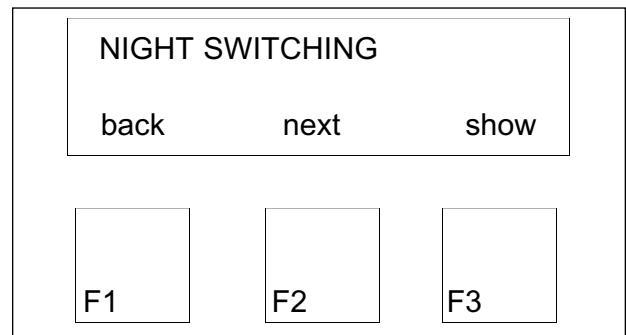


Figure 5-63: Night Switching Screen

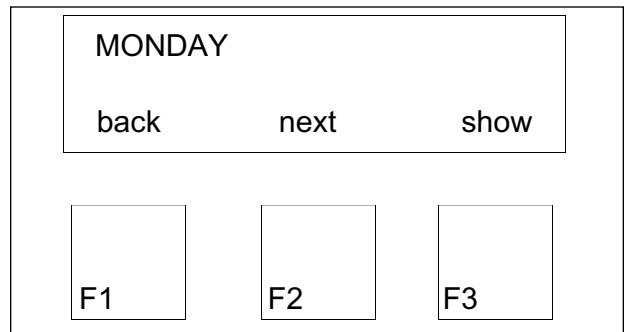


Figure 5-64: Night Switching by Day Screen

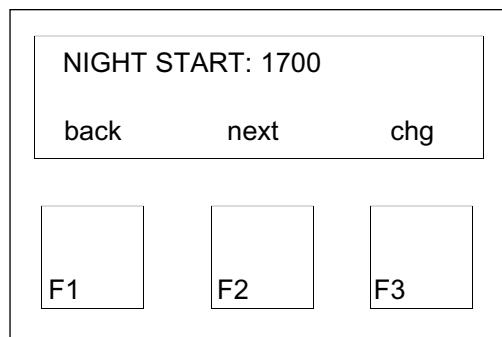


Figure 5-65: Night Switching Start Programming

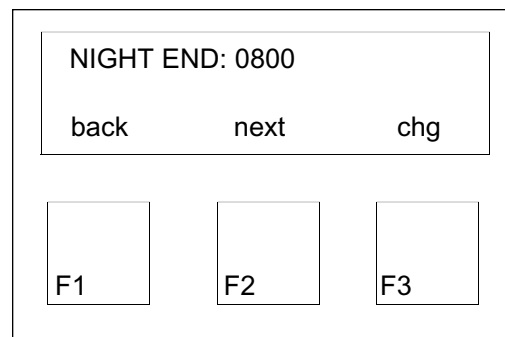


Figure 5-66: Night Switching End Programming

Category 4 - Resource - Database Password

11.4.6 - Resource - Database Password - To change the database password, press the F3 softkey, "Chg.," and enter the new password. It must be six digits in length.

Note: If a system database password is forgotten or lost, power off the system and power it back on. The default password of 000000 can be used again within the first 30 seconds.

Default: The system database password is 000000.

Figure 5-67: Database Password Screen

Category 4 - Resource - Premises Message

11.4.7 - Resource - Premises Message - To view or program premise messages for use by all active extensions on the 616 system, press the F3 softkey, "Show."

The six initial system preset premise messages can be customized. Press the F3 softkey, "Chg.," and use the dialpad to enter a 16-character message.

- Press the " #" key to move the cursor one space.
- Use the 0 key to enter the letters Q, Z, period and the numeral 0.
- Press 0 once for Q, twice for Z, three times for a period and four times for 0.
- The letters are entered as uppercase.
- Use the 1 key to enter a comma, dash, ampersand or the numeral 1.
- Press 1 once for comma, twice for dash, three times for ampersand and four times for 1.

Figure 5-68: Premises Message Screen

Figure 5-69: Out for Lunch Screen

Figure 5-70: Be Back Soon Screen

Figure 5-71: Left for the Day Screen

Figure 5-72: In a Meeting Screen

Figure 5-73: Out of Office Screen

Figure 5-74: On Vacation Screen

Category 4 - Resource - System Speed Dial

11.4.8 - Resource - System Speed Dial - To view or program system speed dial numbers, press the F3 softkey, "Show."

The system speed dial numbers are 20 - 99. Enter a valid number and press the F2 softkey, "Show." If a number is assigned to that speed dial number, it will be displayed. If no number is assigned, the word EMPTY is displayed. To assign a number to the empty number, press the F3 softkey, "Chg," and enter the number. A field may contain up to 16 digits. Valid contents of the field are the digits 0 - 9, #, *, pause, flash and the speed dial chaining code "F(Function)lnn". A pause is entered by pressing F70. A flash is entered by pressing F3. Both a pause and a flash are treated as a single digit.

To chain one speed dial bin to another already programmed bin, create the new speed dial bin and using any of the valid entries listed above. At the end of the new speed dial number enter Function 1 plus the two-digit bin number to which the new speed dial number is being chained. The 616 treats the chaining command "Flnn" as three digits. Note that when Function 1 is entered the 616 displays it as @.

Default: All system speed dial numbers are empty.

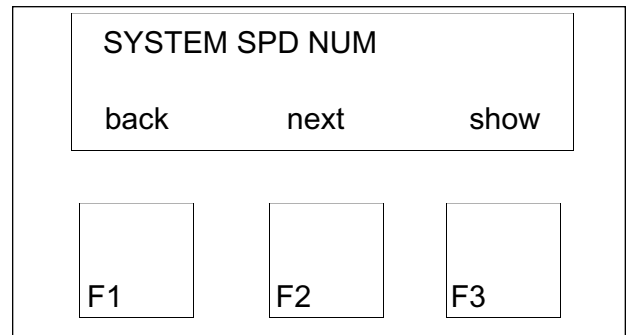


Figure 5-75: System Speed Dial Screen

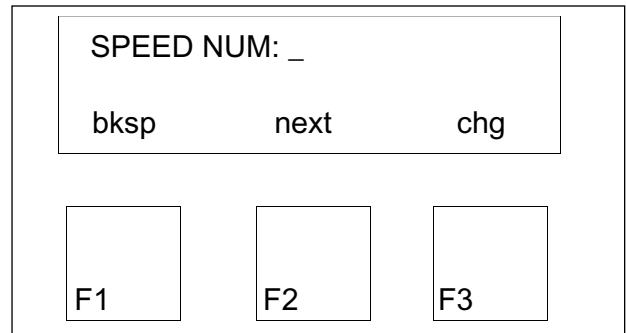


Figure 5-76: System Speed Dial Programming Screen

Category 4 - Resource - Line Copy

11.4.9 - Resource - Line Copy - After programming a line, Protegé® 616 allows the customized features to be copied to any lines. This is accomplished from the Line Copy feature by pressing the F3 softkey, "Show."

Enter the number of the previously programmed line, and press the F2 softkey, "Save."

Enter the number of the line to copy the line features to, and press the F2 softkey, "Save."

The line copy feature copies the following parameters: line type, dialing type, line group, and private to assignment.

Default: There is no programming.

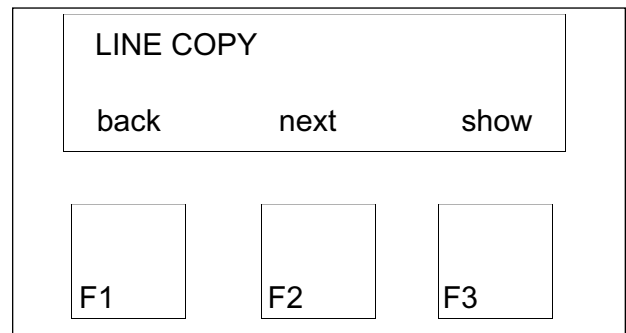


Figure 5-77: Line Copy Screen

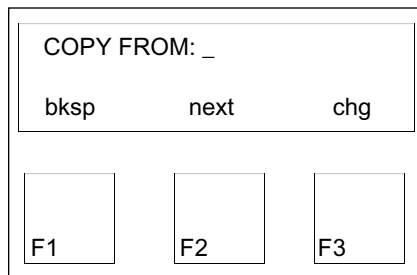


Figure 5-78: Line Copy From Screen

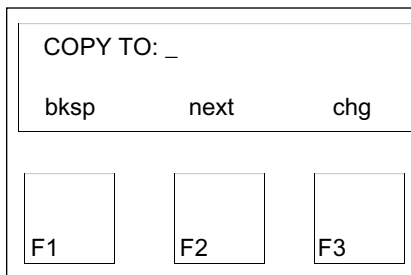


Figure 5-79: Line Copy To Screen

Category 4 - Resource - Extension Copy

11.4.10 - Resource - Extension Copy - After programming an extension, Protegé® 616 allows the customized features to be copied to any extension. This is accomplished from the Extension Copy feature by pressing the F3 softkey, "Show."

Enter the number of a previously programmed extension, and press the F2 softkey, "Save."

Enter the number of the extension to copy the extension features to, and press the F2 softkey, "Save."

The extension copy feature copies the following database parameters: day COS, night COS, line assignment, receive assignment, ring assignment, extension group, function key allow, system speed check, and intercom mode.

A rectangular screen display with a title bar at the top containing the text "COPY FROM: _". Below the title bar are three softkey labels: "bksp", "next", and "chg". At the bottom of the screen are three square buttons labeled "F1", "F2", and "F3".

Figure 5-81: Extension Copy From Screen

A rectangular screen display with a title bar at the top containing the text "EXTENSION COPY". Below the title bar are three softkey labels: "back", "next", and "show". At the bottom of the screen are three square buttons labeled "F1", "F2", and "F3".

Figure 5-80: Extension Copy Screen

Default: There is no programming.

A rectangular screen display with a title bar at the top containing the text "COPY TO: _". Below the title bar are three softkey labels: "bksp", "next", and "chg". At the bottom of the screen are three square buttons labeled "F1", "F2", and "F3".

Figure 5-82: Extension Copy To Screen

Category 4 - Resource - KSU Revision

11.4.11 - Resource - KSU Revision - This view-only feature displays the Protegé® 616 software version number.

A rectangular screen display with a title bar at the top containing the text "KSU REVISION". Below the title bar are three softkey labels: "back", "next", and "show". At the bottom of the screen are three square buttons labeled "F1", "F2", and "F3".

Figure 5-83: KSU Revision Screen

A rectangular screen display with a title bar at the top containing the text "KSU: K03UF0.F06". Below the title bar are two softkey labels: "back" and "next". At the bottom of the screen are three square buttons labeled "F1", "F2", and "F3".

Figure 5-84: KSU Revision Number Screen

Category 4 - Resource - Feature Key Copy

11.4.12 - Resource - Feature Key Copy - After programming a keyset's feature keys, Protegé® 616 allows the customized feature key programming to be copied to the same type of keyset. This is accomplished from the Feature Key Copy feature by pressing the F3 softkey, "Show."

Enter the extension number of a previously programmed keyset, and press the F2 softkey, "Save."

Enter the number of the extension to copy the features to, and press the F2 softkey, "Save."

Note: This programming can rearrange the line assignment for an extension. In some cases the private line may be removed.

Default: There is no programming.

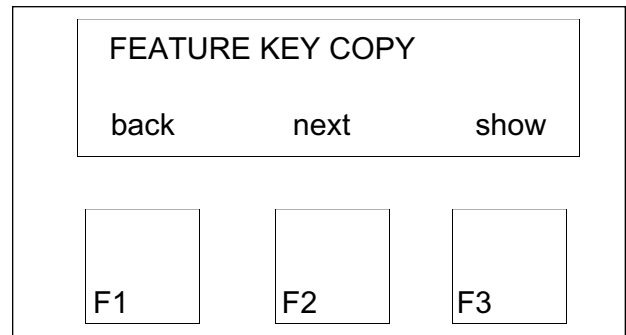


Figure 5-85: Feature Key Copy Screen

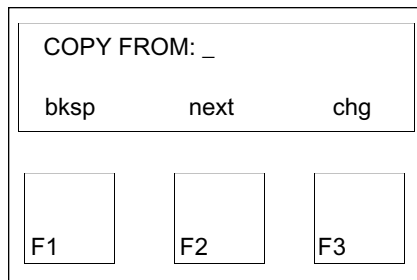


Figure 5-86: Key Copy From Screen

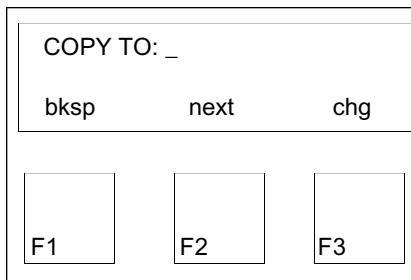


Figure 5-87: Key Copy To Screen

Category 5 - Restriction

11.5 - Restriction - To program Toll Restriction programming, press the F3 softkey, "Show."

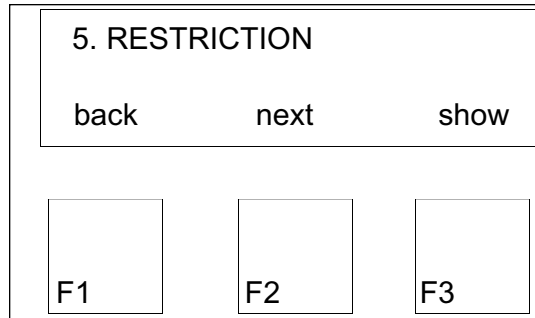


Figure 5-88: Restriction Screen

Category 5 - Restriction - Dialing Table

11.5.1 - Restriction - Dialing Table -Press the F3 softkey again to program the Digit Interval Table.

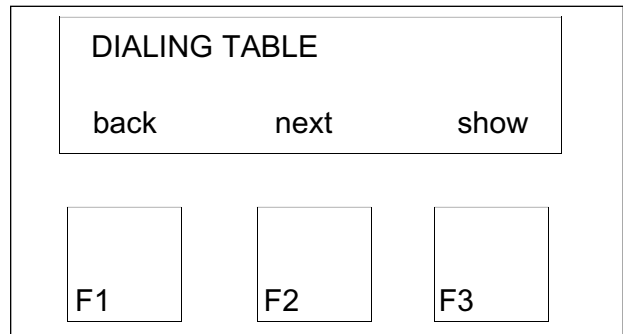


Figure 5-89: Dialing Table Screen

Category 5 - Restriction - Dialing Table

11.5.1.1 - Restriction - Dialing Table - DGT Interval

- There is a possibility of 100 different number intervals with Toll Restriction. Enter a number between 001 - 100 and press the F2 softkey, "Show."

If the Starting Digit String has not been programmed, the screen will display the word "Empty." If it has been programmed, the screen will display the starting digit. To add or change a number, press the F3 softkey, "Chg," and enter a number up to 10 digits in length.

If the End Digit String has not been programmed, the screen will display the word "Empty." If it has been programmed, the screen will display the starting digit. To add or change a number, press the F3 softkey, "Chg," and enter a number up to 10 digits in length.

The following are tips for programming the Start and End Digit Strings:

- To allow one specific number or range, the same number must be programmed in the both the "Start" and "End" interval field for the associated COS. For example, to allow the dialing of "800" numbers, then 1800 must be in both interval fields.
- Toll Restriction assumes that any number/range not entered in the Toll Restriction fields is denied.
- A dialed number is allowed if the same COS is assigned to the same number in more than one interval.
- To allow any number, program a "don't care" digit. Enter Function 7#, which will display an "x" in the programming signifying any number is allowed.

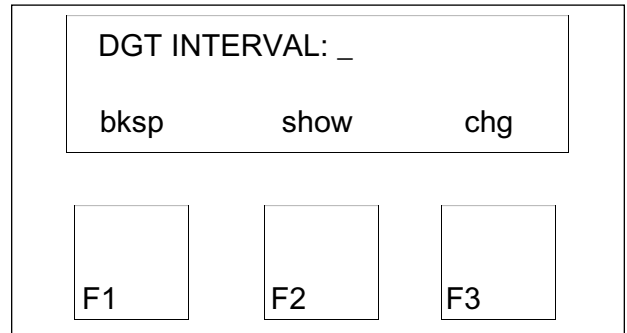


Figure 5-90: Digit Interval Screen

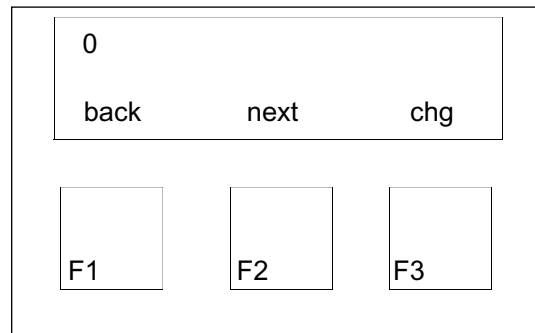


Figure 5-91: Digit Interval Starting Digit Screen

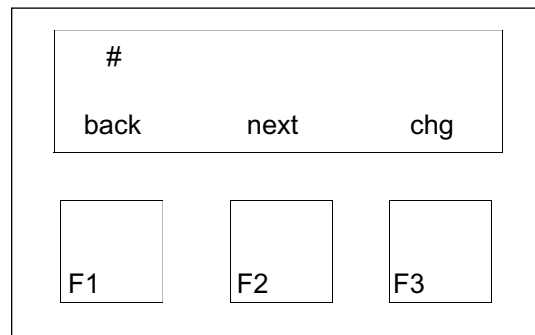


Figure 5-92: Digit Interval Ending Digit Screen

Category 5 - Restriction - Dialing Table

11.5.1.2 - Restriction - Dialing Table - Extension COS - After completing the Digit Interval Table, the next step is to assign programmed intervals to each Class of Service. Remember that both the Day and Night Allowed needs to be programmed.

When an extension makes an outgoing call, the system checks that extension's class of service to determine whether or not the extension has approval to make that type of call. To allow an extension to make calls that might otherwise be restricted, change the Class of Service. For every Digit Interval Table programmed, the Day and Night Class of Services must be programmed. Press the F3 softkey, "Show," to view each of the eight classes of service.

To enable each class of service to use each interval press the F3 softkey, "Chg," to toggle between "Y" and "N."

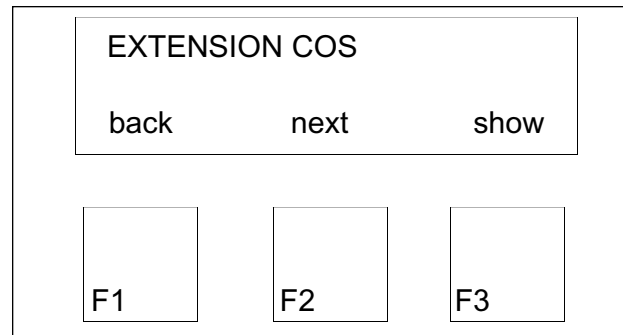


Figure 5-93: Extension Class Of Service Screen

Default: The Digit Interval Table is empty except interval number "001" which has the digit string "0" to "#" stored. This interval is used for extensions with the Class of Service 0 only.

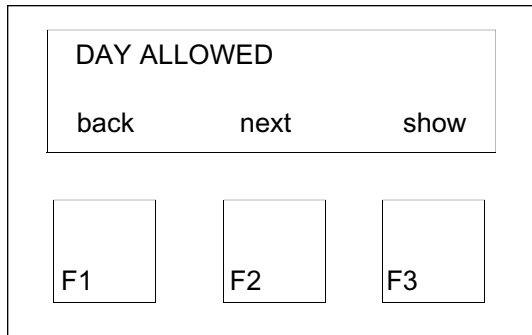


Figure 5-94: Extension Day Allowed COS Screen

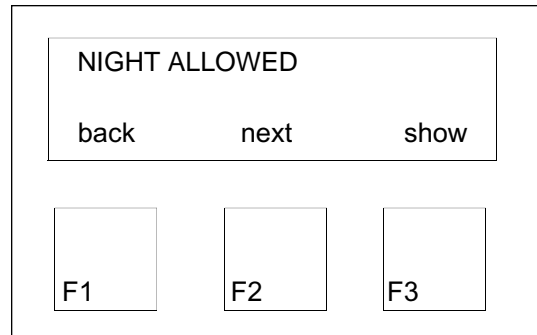


Figure 5-95: Extension Night Allowed COS Screen

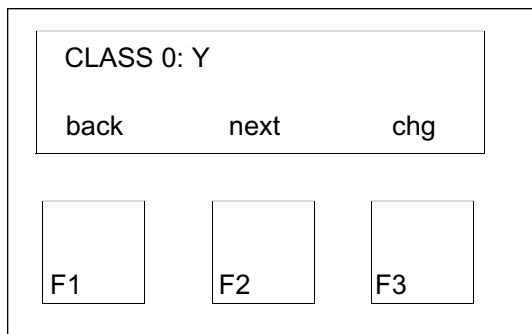


Figure 5-96: Extension COS Screen

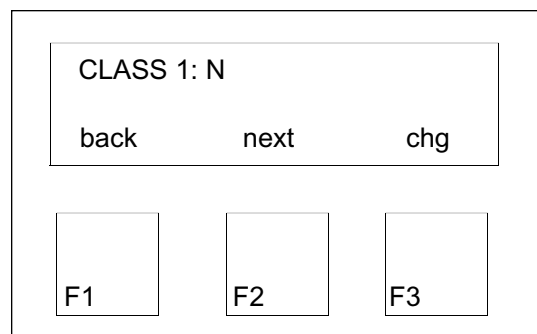


Figure 5-97: Extension COS Screen

Category 6 - Control

11.6 - Control - This category contains programming for Voice Mail and offers the ability to cold and warm start the Protegé® 616 system. To enter Voice Mail programming or restart the system, press the F3 softkey, "Chg."

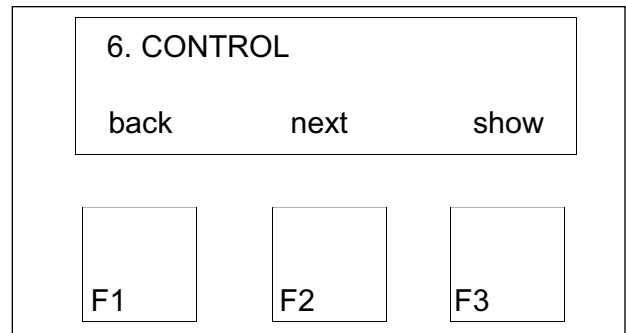


Figure 5-98: Control Screen

Category 6 - Control - Voice Mail

11.6.1 - Control - Voice Mail - Press the F3 softkey again to gain access to the Voice Mail or the F2 softkey, "Next," to move to the restart screens.

If continuing through the Voice Mail category, press the F3 key again to define the voice mail group members.

Every voice mail port must be programmed to a Voice Mail group, including the B1 and B2 channels. For example if the voice mail ports are 13 and 14, then their corresponding B2 channels, 61 and 62 also should be programmed. The system supports eight Voice Mail Hunt Group Members. Enter the port numbers by pressing the F3 softkey, "Chg." Enter the port number and press the F2 softkey, which now displays "Save." Once the port number is saved, the F2 softkey again displays "Next." Press it to move to the next Hunt Group member. Repeat this process until all voice mail ports are programmed.

- The voice mail hunt group directory number is 82.
- To provide "delayed ring" on all extensions, program the Alternate Attendant as voice mail hunt group directory number 82.

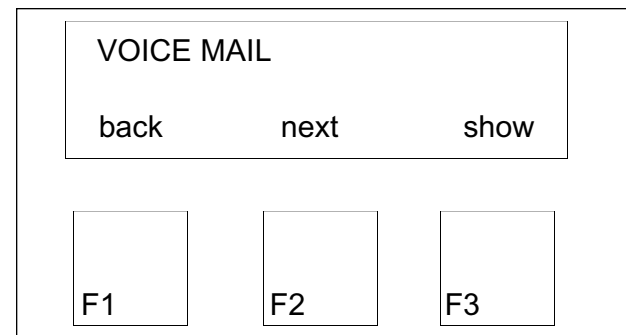


Figure 5-99: Voice Mail Screen

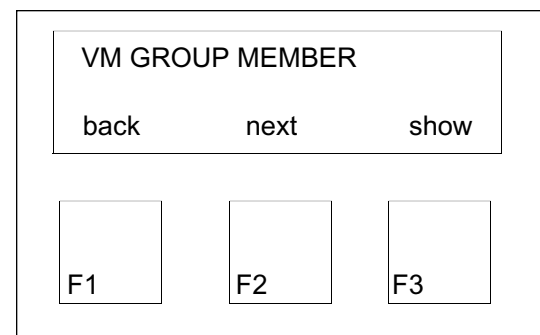


Figure 5-100: Voice Mail Group Member Screen

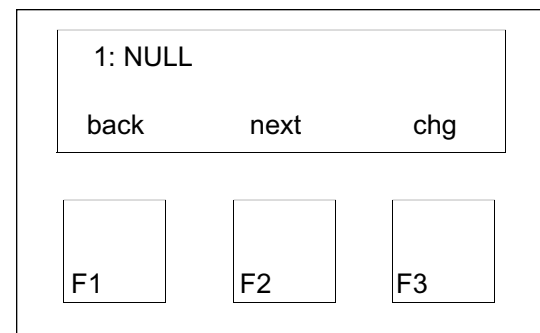


Figure 5-101: Voice Mail Individual Member Screen

Category 6 - Control - Voice Mail

11.6.1.1 - Control - Voice Mail - Prefix Code - To program the Prefix Codes that are sent by the KSU to the Voice Mail when Voice Mail answers a call, press the F3 softkey, "Show." There are five different fields that must be programmed. Press the F2 softkey, "Next," to move through the five fields.

When the Prefix Code needs to be changed in a field, press the F3 softkey, "Chg," and enter the new code. The maximum length of a Prefix Code is four digits.

Default:

ICM/VM	12
Transfer	11
Busy Fwd	11
No_Ans Fwd	11
Direct Fwd	11

Figure 5-102: Voice Mail Prefix Code

Figure 5-103: ICM/VM Screen

Figure 5-104: Transfer Screen

Figure 5-105: Busy Forward Screen

Figure 5-106: No Answer Forward Screen

Figure 5-107: Direct Forward Screen

Category 6 - Control - Voice Mail

11.6.1.2 - Control - Voice Mail - Suffix Code - The Suffix Code is any numbers that follow the extension number when a call is directed to a voice mail. It can be up to two digits in length.

Default: This field is set to zero.

Figure 5-108: Voice Mail Suffix Code Screen

Category 6 - Control - Voice Mail

11.6.1.3 - Control - Voice Mail - Disconnect Digits -

The disconnect digits are sent to the voice mail when a call is terminated by the system. The maximum number of digits is eight.

Default: * * * * *

DIS DGT: T T T T T T

back next chg

F1 F2 F3

Figure 5-109: Voice Mail Disconnect Digits Screen

Category 6 - Control - System Warm Start

11.6.2 - Control - System Warm Start - A system warm start is performed when the system needs to be reset, but the customized programming needs to remain. Press the F3 softkey, "Chg," to continue with the warm start.

Before the system will reset itself, the system prompts to determine if this action is needed. To continue with the warm start, press the F3 softkey, "Yes." To abort the warm start, press the F1 softkey, "No."

Note: All call processing will immediately cease.

SYS WARM START

back next show

F1 F2 F3

Figure 5-110: System Warm Start Screen

CHK PSWD: _

bksp next chg

F1 F2 F3

Figure 5-111: System Warm Start Password Screen

Are you sure?

no yes

F1 F2 F3

Figure 5-112: System Warm Start Confirmation Screen

Category 6 - Control - System Cold Start

11.6.3 - Control - System Cold Start

System Cold Start defaults the database. All prior customized programming will be lost, and all database parameters will be returned to default parameters.

Perform a system cold start to reset the system, and default the database. Press the F3 softkey, "Chg," to continue with the cold start.

Before the system will reset itself, the system prompts to determine if this action is needed. To continue with the cold start, press the F3 softkey, "Yes." To abort the cold start, press the F1 softkey, "No."

Note: All call processing will immediately cease.

The screen displays the title "SYS COLD START" at the top. Below the title are three softkey options: "bksp", "next", and "show". At the bottom of the screen are three function key buttons labeled "F1", "F2", and "F3".

Figure 5-113: System Cold Start Screen

The screen displays the title "CHK PSWD: _" at the top. Below the title are three softkey options: "bksp", "next", and "chg". At the bottom of the screen are three function key buttons labeled "F1", "F2", and "F3".

Figure 5-114: System Cold Start Password Screen

The screen displays the title "Are you sure?" at the top. Below the title are two softkey options: "no" and "yes". At the bottom of the screen are three function key buttons labeled "F1", "F2", and "F3".

Figure 5-115: System Cold Start Confirmation Screen

Category 6 - Control - System Type

11.6.4 - Control - System Type - System Type sets the system made of operation to be either Multi-Function (MF) or Key Function (KF). See Page VII for more detail.

To change the system mode of operation, press the F3 softkey "Chg."

Default: The system operates in MF mode.

The screen displays the title "SYSTEM TYPE: MF" at the top. Below the title are three softkey options: "back", "next", and "chg". At the bottom of the screen are three function key buttons labeled "F1", "F2", and "F3".

Figure 5-116: System Type Screen

6 Troubleshooting

This chapter describes basic troubleshooting techniques to identify and correct system problems.

When help is required, contact Sprint Products Group Technical Services at 1-800-791-1110. Identify the system as a 616 and have the following information available:

- Number of lines and extensions on the system
- Type of phones connected to the system - business with display, business without display or single line telephone
- Type of analog devices, such as analog adapters, fax machines, etc., are attached to the system
- Types troubleshooting procedures, if any, used
- Whether you are a certified Protegé[®] technician

1. Normal Operation

A correctly installed 616 system will exhibit the following events and indications when turned on.

- 1) The power LED will light immediately.
- 2) Approximately 10 seconds after start up the power LED will blink rapidly.
- 3) All phones that are not connected to an analog adapter will ring twice and then become operational.

If any of these events or indications do not occur, the system may not operate properly.

2. Upgrading the System Software

When upgrading the software on a 616 system, the following procedure should be followed:

- 1) If mounted, remove the KSU and place it on a solid surface. Remove the four screws from the cover.

- 2) Connect the grounding wrist strap to an approved ground.
- 3) Find the anti-static bag containing the EPROM chip for the Common Control Board.
- 4) Place an anti-static bag on a level surface, and, observing static discharge precautions, place the KSU on the bag.
- 5) Being careful not to touch the chip pins, remove the EPROM from its carrier.
- 6) Insert the EPROM in its socket. Align the notch on the chip with the notch on the socket. Make sure that all pins are properly seated.
- 7) Replace the KSU cover and the four screws that hold it in place.
- 8) Move the RAM switch from On to Reset. Wait 10 seconds and return the switch to the On position.
- 9) Return the KSU to its wall mount (if applicable).
- 10) Apply power.
- 11) Observe the heartbeat LED on the KSU side panel for proper indication.

3. Cold Starting the System

(Defaulting the Database)

To perform a System Cold Start, follow the steps below:

- 1) Enter programming through a display phone by pressing the Function, #, * keys. A prompt for the "DB PSWD" will be displayed.
- 2) Using the dial pad, enter the password and press the "show" key.
- 3) Proceed to the "Control" category by pressing the "next" key.
- 4) When "6. Control" is displayed, press the "show" key. The first item displayed is "Voice Mail."

-
- 5) Press the "next" key to move to "SYS COLD START." The system will display the prompt "CHK PSWD." Enter the database password at this time, and press "show."
 - 6) The system will prompt "Are you sure?" On the display will be "yes" or "no" from which to choose.
 - 7) The system will reboot and all prior customized programming will be lost, and all database parameters will be returned to default parameters.

4. Troubleshooting

The following includes information on problems and possible causes with corrective actions to take.

If the problem does not match any of the descriptions, contact Sprint Products Group at 1-800-791-1110. The SPG technical support center is open Monday through Friday from 7:30 a.m. to 5:30 p.m. CST.

4.1 Extensions

4.1.1 Accessing An Outside Line

Extensions cannot access outside lines by pressing an access code. The Line Type Assignment is set to PBX because it is behind a PBX system.

Check to see if the PBX Access Code is programmed correctly. An incorrect PBX Access Code will deny users access to outside lines.

4.1.2 Flashing LED Must Be Pressed To Answer ICM Or Incoming Call

Users cannot pick up the handset to answer an incoming or intercom call. The flashing LED must be pressed.

The Automatic Line Selection is set to ICM with Voice Call and Auto Answer disabled. Enable Auto Answer.

4.1.3 Busy Display Phone Does Not Ring

If a display phone is busy on a call, then the phone will not ring if there is an incoming call.

Check to see if Busy Ring is disabled on the phone. Function # 2 acts as a toggle and will enable Busy Ring.

4.2 System

4.2.1 The red heartbeat LED is not lit.

The KSU is not receiving any power. Check to see that the AC transformer is plugged into a working outlet. Check to see that the power cord is plugged

into the 616 KSU.

4.2.2 LCD Displays "DB Setup Failure"

Software is installed properly, but when accessing the database, error tones are heard and the phone's LCD displays "DB setup failure."

Check to see that the EPROM pins are seated properly. If the EPROM is properly seated, remove power and slide the RAM switch from On to Reset for 10 seconds. Return the switch to the On position and reconnect power to the KSU.

4.2.3 The heartbeat LED on the 616 KSU is lit solid red

The software EPROM pins are not seated properly on the IC socket. Remove power from the KSU and gently pry the EPROM upward. Reseat the EPROM and reconnect power.

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