

iP Series

Installation Manual

0450-0196
Rev. D



We Make It Easy To Communicate

About ESI

ESI (Estech Systems, Inc.) is a privately held corporation based in Plano, Texas, in the internationally known "Telecom Corridor." Founded in 1987, ESI designs and builds innovative telecommunications products for businesses like yours. Because of their powerful combination of value and features, ESI products are consistently recognized by industry publications and leaders. In fact, ESI also creates telecommunications products for major companies to market under **their** well-known brand names.

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ESI is an ISO 9001-certified company.

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(This page included for pagination purposes only.)

General description

ESI's **IP Series** (IP 200 and IP 40) IP telephony products are advanced business telecommunications systems, each of which includes not only phone service but voicemail, an automated attendant, automatic call distribution, and computer integration. These features are all provided over standard Ethernet cabling, using the Internet Protocol and certain other protocols from the TCP/IP suite.

In IP telephony, voice is digitized at the telephone and then converted to IP data packets at the telephone. Those packets are sent across an IP data network and then converted back to a voice signal at the other party's IP telephone or at the IP PBX for connections to outside lines.

The IP Series consists of an IP Feature Phone, the Remote IP Feature Phone and two models of the IP PBX.

The IP Feature Phone provides all the features and functionality expected of business phones. It looks and feels exactly like ESI's popular IVX[®] digital telephone, but it connects to the system over the same Ethernet[®] cables used by PCs and data servers. Voice is carried over the network at an uncompressed 64 Kbps — the highest quality available.

The Remote IP Feature Phone, like the IP Feature Phone, is a full-featured business phone but provides the additional benefit of working from a remote site connected into the main office. Like an office extension, the Remote IP Feature Phone connects the remote user to the office environment and, thus, is ideal for the tele-worker or the executive home office. A suitable high-speed data connection, such as over a WAN or high-speed Internet connection, is required between the remote site and the main office. Voice is carried in a high-quality, compressed 22 Kbps format.

The two IP PBXs differ only in the number of supported CO lines and stations. The IP 200 can be configured to handle up to 66 CO lines, 30 analog ports and 96 stations, while the IP 40 can handle up to 30 lines, nine analog ports and 28 stations. The IP PBXs connect directly to an Ethernet network and are both rack-mountable and wall-mountable.

Telephone system features

The IP Series PBXs support a comprehensive array of robust features, including:

- **Impressive expansion capability** – Can handle up to 66 CO lines and 96 stations.
- **T1 and ISDN PRI support** – Can connect to higher-bandwidth lines.
- **IP Feature Phone** – Compact and rugged design includes a high-quality speakerphone, large and informative multi-functional display, and a specially designed key layout with several dedicated keys to minimize or eliminate the need to memorize codes. The IP phone is TAPI-compliant, and a TAPI driver is available as a free download from the ESI Web site.
- **Extensive help** – Verbal User Guide[™] uses spoken and displayed help prompts to assist everyone from the installer through the administrator down to the least experienced end user. Easily accessible with one press of the **PROG/HELP** key.
- **Enhanced caller ID** – Allows one-touch automatic message return.
- **Live call recording** – Can record any conversation or personal memo, with moving or copying of any recording to another user's voice mailbox (see "Voice mail features," below).
- **Call waiting** – Includes helpful display, showing both calls' caller ID information, and easy one-key toggling between calls.
- **Conference calling** – Includes 24 conference bridges, and a conference may contain up to four parties, so the IP Series can support six conferences of four parties each or eight conferences of three parties each.

- **Esi-Dex™ speed-dialing** — Calls any number from any of the three separate lists (personal, station, and system); uses Caller ID information or direct keypad entries.
 - **Dedicated overhead paging interface** — Allows overhead paging through the user's own overhead paging system.
 - **911 alert** — Provides immediate line access if any station dials **9 1 1** to report an emergency; sends a message via the serial port indicating the start date, time, station number and end-time of the 911; also sounds a warning tone at the operator station and displays (for example):
911 CALL FROM
X102 JOHN JAMES
- Note:** You can dial **9 1 1** from any station, even one usually restricted from outside line access in Function 31 (see pages F.1–F.8).

Remote network features (VoIP)

In addition to a robust set of telephony features, the IP Series PBXs have the capability for extending PBX operation to any location that has access to a suitable high-speed data connection. This capability is provided with the Remote IP Feature Phone and *Esi-Link*.

- **Remote IP Feature Phone** — Ideal for the remote site installation requiring one, or no more than a few, extensions. Once installed, the remote user is provided a near identical capability and connectivity of the phone user in the main office. Numerous remote sites can be supported from a single IP PBX. Refer to the *Remote IP Feature Phone Product Overview* (#0450-0213) and *Using the Remote IP Feature Phone* (#0450-0282) for more information. The *Remote IP Feature Phone Installation Manual* (#0450-0263) provides additional installation information intended to be used with this manual.
- **Esi-Link** — Provides the capability of connecting up to 100 IP PBXs at different locations into a single private phone system. The ESI IP PBX features that so far have been available to a single location can now be extended across several locations, greatly enhancing the integration opportunities of a business with multiple locations. Refer to the *Esi-Link Product Overview* for a full explanation of Esi-Link capabilities.

Voice mail features

- **16 built-in voice mail ports** — These are in addition to the up-to-192 possible call-processing ports; thus, you may build the system to its maximum for call-handling without having to balance voice mail needs versus call-handling needs.
- **Highest-grade voice quality** (64 Kbps sampling) for voice mail and other storage of voice messages.
- **Nine message-on-hold sources** — Among these are three prerecorded tracks and five customer-recordable tracks; also supports live input.
- **Off-premises message delivery.**
- **Urgent messages** — Can deliver higher-priority messages first.
- **Several different mailbox types**, including group, broadcast, informational, cascade paging and Q & A.
- **Message Recycle Bin** (undelete) — Remembers, and can restore, each mailbox's 10 most recently deleted messages
- **Quick Groups™** — Makes it easy to leave voice mail messages for several users.
- **Quick Move™** — Allows recording conversations or calls directly into a designated mailbox.

- **Virtual Mailbox Key™** — Allows easy monitoring of a second mailbox.
 - **New-message skip** — Skip a new message and have it appear as “new” the next time.
 - **Message monitor key** — Toggle the live-call screening feature with a single programmable key.
 - **Message move and delete** — Move-and-save, or move-and-delete, messages.
-

Call-handling features

- **AutoPage™** — Allows a caller, when forwarded to voice mail, to page a station user.
 - **Off-Premises “reach me”** — Lets callers reach their party while he or she is off premises.
 - **Virtual Answer Key™** — Users can play pre-programmed prompts to inbound callers.
 - **Caller ID missed-call key** — Stores caller ID for ten most recent missed calls.
 - **Auto-attendant trunk-to-trunk transfer** — Create an auto-attendant outdial branch without the need for Centrex lines.
 - **Separate hold/park recall timers** — Separate recall timers for calls on park and hold.
 - **System-wide hold** — Puts the CO line on hold, after which any user can pick up the call by pressing the line key.
 - **System-connect tone control** — Allows the installer or administrator to disable the connect tone.
 - **CO line labeling** — Labels the CO lines and has them appear in the display when they ring.
 - **QuickPage™** — Allows a station user to park a call and automatically page another user.
-

Auto attendant features

- **Six levels, 100 branches** — Allow you and your customer to set up a more caller-friendly answering environment, including a company directory.
 - **Virtually unlimited call routing** — Includes off-premises transfer, pager notification, more.
-

ACD features

- Routes calls within designated departments for quickest possible call answering.
- Uses IP Feature Phone display to provide up-to-the-second information on queues and wait times.
- Sends calls to longest-idle agent.

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Hardware overview/installation

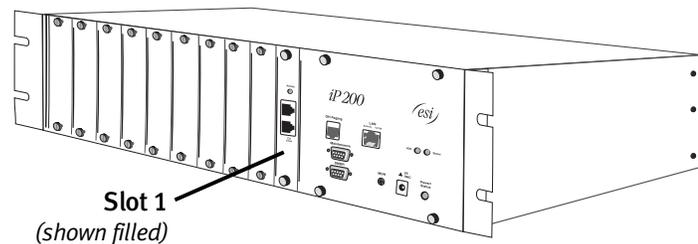
Each IP Series IP PBX consists of a single cabinet with:

- Two or 10 expansion slots (IP 40 and IP 200, respectively)
- An external transformer
- An IP module that includes:
 - A mainboard
 - A Memory Module (hard disk drive)
 - A Local Network Card
 - An optional Remote Network Card, in either three-channel or 12-channel configuration

Each IP PBX is shipped with one port card (see page B.3 for the port card options). The port cards are interchangeable between the IP 200 and IP 40.

IP 200

The rack-mountable IP 200 measures 5.5" H x 17.5" W x 9" D. Optional external "ears" attach to each side for mounting the IP 200 in a 19" data rack or on a wall.

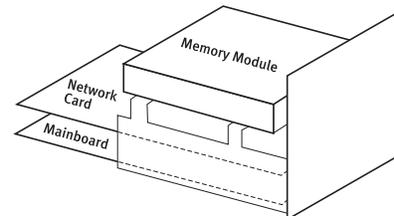


The rightmost third of the IP 200 houses the IP module, and the leftmost two-thirds houses the port cards. The port cards are accessible from the front of the IP 200. The first port card is in Slot 1 (farthest to the right), and additional port cards are added from right to left. The IP 200 has 10 available port-card slots.

The IP module consists of:

- **Mainboard** — Provides the AC power connector, two serial ports, and the MOH connector.
- **Local Network Card (LNC)** — Provides an RJ-45 10/100Base-T Ethernet connector and an RJ-11 overhead paging port.
- **Memory Module** — A hard disk drive that contains the call-processing software and provides storage for voice mail.

The mainboard is secured to the floor of the IP module with metal standoffs that also provide support for the LNC. The network card sits on top of the standoffs and is secured to them with screws. The Memory Module is mounted on a steel plate, which in turn sits on top of the sheet metal that forms the sides of the IP module and is secured by screws.

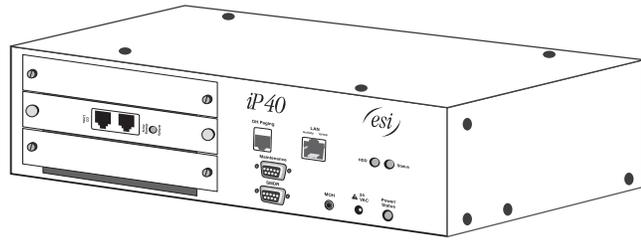


The mainboard and the LNC are joined by means of a 50-pin ribbon cable that runs from J9 on the mainboard to J1 on the LNC. The Memory Module is joined to both of the circuit boards by means of a standard 40-pin IDE cable that connects to JP9 on the LNC and JP2 on the mainboard. A standard four-pin power connector runs from J8 on the mainboard to the back of the Memory Module.

The Local Network Card (LNC) connects to the backplane by means of a 60-pin cable that uses J6 on the Ethernet card and slides onto U3 on the backplane. The optional Remote Network Card (RNC) is inserted into the 72-pin socket U13 on the LNC, located directly behind the RJ-11 overhead-paging port. (Refer to each card's installation instructions for more details.)

IP 40

The IP 40 is a smaller version of the IP 200. It measures 11" W x 3 1/2" H x 9" D. The optional external "ears" will allow it to be mounted in a 19" data rack; alternatively, it can be set on a tabletop, or a separately orderable kit will allow wall-mounting.



The IP module (the mainboard and the Local Network Card) is on the right-hand of the IP 40. The IP 40 provides two slots for port cards. On the left-hand side, the Memory Module is mounted in the floor of the IP 40. The first port card is installed horizontally, just above the Memory Module, and the second port card can be installed above the first.

Port card #1 is attached directly to J7 on the LNC via a 60-pin ribbon cable. Port card #2 is attached to J8. As with the IP 200, the mainboard's J9 connects to the LNC's J1, and the Memory Module's IDE cable connects to JP9 on the LNC and JP2 on the mainboard. The Memory Module is powered by a 4-wire power cable connected to the mainboard's J8. The optional Remote Network Card (RNC) is inserted into the 72-pin socket U13 on the LNC, located directly behind the RJ-11 overhead-paging port.

The front of the IP 40 features an AC power connector, two serial ports, an MOH connector, one RJ-45 10/100Base-T Ethernet connector, and an RJ-11 overhead paging port.

Main board

The main board combines leading-edge hardware components — including a Motorola® ColdFire® processor and DSP structure — along with proprietary operating system software. The board provides:

- System control of the Memory Module and port cards
- Two standard RS-232C DB9 serial ports
- A built-in 33.6 Kbps modem for remote access
- An external paging-device interface
- MOH interface

Local Network Card (LNC)

The Local Network Card (LNC) provides the 10/100Base-T RJ-45 interface that allows the IP system to connect to the Ethernet network. The LNC features highly configurable DSP (digital signal processor) technology that manages the flow of traffic among the port cards and converts IP packets into PCM traffic for transmission over the PSTN. This card also provides through the RJ-11 jack a dry-contact interface, used by popular overhead paging systems.

Memory Module

The Memory Module — a hard disk drive with proprietary formatting — contains all system program and configuration data, along with pre-loaded voice prompts. The Memory Module provides 140 hours of voice storage at the industry's highest-quality sampling rate: 64 kilobits/second.

Remote Network Card (RNC)

The Remote Network Card (RNC) provides G.729A compression to support Remote IP Feature Phones and multi-site installation using Esi-Link. The RNC is offered in two versions that can be added to the IP 200 or IP 40. The RNC 3 provides three channels of voice compression; the RNC 12 provides 12. The RNC compresses the two-way talk path, 64 Kbps each way, into 8-Kbps talk channels. Each compressed bi-directional channel, voice and control signaling, requires only 22 Kbps. This compression makes remote connection between IP PBX and Remote IP Feature Phones practical.

Port card options

Three port cards are available for creating various system configurations:

Card	What it provides
303	3 loop-start lines via an RJ-11 connector, 3 analog device ports via an RJ-11 connector
600	6 loop-start lines via two RJ-11 connectors
DLC	<i>Either 24 loop-start/ground-start/E&M/E&M DNIS/DID trunks, or 23 digital ISDN lines (23B + 1D), via an RJ-48 connector</i>

Note: The IP 200 and the IP 40 will have one of these cards installed in the first card slot upon delivery.

IP Feature Phones

The IP Feature Phone is equipped with speakerphone, 16-character-by-2-line LCD display, and fixed and programmable feature keys. IP phones provide two RJ-45 connectors – one for connecting to the network and one for another Ethernet device – and a connector for a 64-key expansion console. AC power is provided through a small external grounded transformer with a 12-foot cord. A 12-foot Category-5 Ethernet cable is provided with each phone.

Remote IP Feature Phone

The Remote IP Feature Phone is virtually identical to the IP feature Phone. The physical appearance is the same. The operation varies in only a few minor ways. The critical difference is the G.729a processor contained with the Remote IP Feature Phone. This processor performs the voice compression required to make remote IP telephony practical.

64-Key Expansion Console

The 64-Key Expansion Console adds 64 additional programmable feature keys to a station. The Console is connected to its host phone via a standard six-conductor silver-satin cable that attaches to the appropriate connector on the underside of the IP Feature Phone. The Console does not use one of the 96 available station ports. AC power for the expansion console is obtained from the IP telephone's external transformer, through the connector cable.

Note: Up to 20 consoles can be installed in a fully-configured system.

System capacity

IP 200

The IP 200's 10 slots can hold any combination of port cards (with a maximum of two DLCs, whether configured for T1 or PRI, supported). If two DLCs are installed and each of them provides its full 23 or 24 channels, the IP 200 will support only 18 to 20 more CO lines in its remaining eight slots.

Max configurations for IP 200

DLCs (23 or 24 chs. ea.)	C A R D S				Y I E L D		
	600 cards	303 cards	RNC12 cards	CO lines	Analog ports	Remote channels	IP stations
2	—	8	—	64–66	24	—	96
2	3	—	—	64–66	—	—	96
1	5	4	—	65–66	12	—	96
—	10	—	—	60	—	—	96
—	—	10	—	30	30	—	96
2	1	7	1	64–66	21	12	96

IP 40

The IP 40's two slots can hold up to one DLC; each can hold a 303 Card or 600 Card. The maximum IP 40 configuration would include one 600 Card, one DLC and an RNC12 card: this yields 29 to 30 CO lines and 28 IP stations (of which up to 12 can be remote IP stations).

Cautions

Important: This information complies with the requirements of Underwriters' Laboratories (UL) and UL Standard 1950.

When using this telephone equipment, always exercise basic safety precautions in order to minimize the risk of fire, electric shock or injury to persons. **Before proceeding, please read the following:**

The airflow vents on the IP PBX **must** be free of obstruction for proper cooling. Similarly, **do not** install the IP PBX in areas of extreme heat or improper ventilation. **Never** insert objects of any kind through the ventilation slots on the IP PBX; doing so may result in contact with dangerous voltages — or cause an electrical short capable of producing fire or shock.

Do not use liquids or aerosols to clean any IP equipment; rather, use a cloth that is only **slightly** damp.

The IP telephone/voice-mail system contains **no** components that are serviceable by either non-dealers or non-manufacturer technicians. **All service must be referred to the dealer for further handling.**

To reduce the risk of fire, use **only** 26 AWG or better telecom wire.

Power supply (24V)

Always disconnect the power supply and telephone lines from the IP PBX **before** opening the case for service or component disassembly or replacement.

Heed all warnings and instructions in documentation or marked on the IP PBX or peripheral equipment.

Fuse

Contact the factory **before** attempting to replace the fuse. The 5.0A fuse is located on the motherboard directly next to the power jack marked with "F1."

Battery

Caution: There is a danger of explosion if the onboard lithium battery is incorrectly replaced. Replace only with Rayovac® BR1225 (or equivalent). Dispose of used batteries according to the battery manufacturer's instructions.

Regulatory information

United States of America

Registration

The CO line telephone numbers, FCC registration number, and ringer equivalence number (REN) of this equipment must be provided to the telephone company before installation. (See below for FCC registration number and ringer equivalence number.)

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and — if not installed and used in accordance with the instruction manual — may cause harmful interference to radio communications (in which case, the user will be required to correct the interference at his/her own expense).

FCC Part 68

Registration Number: 1T1USA-33727-MF-E

Ringer equivalence number (REN): 0.5

Dominion of Canada

Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Technical Equipment Technical Requirements document(s). 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 coordinated by a representative designated by the supplier. 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 at 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 electrical inspection authority, or electrician, as appropriate.

Ringer equivalence number (REN): 0.5

Notice

The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices does not exceed 5.

Hardware installation

Site location

As with most electronic equipment, the environmental conditions are very important, and the site should be chosen using good common sense. Provide a dry, clean, and accessible location.

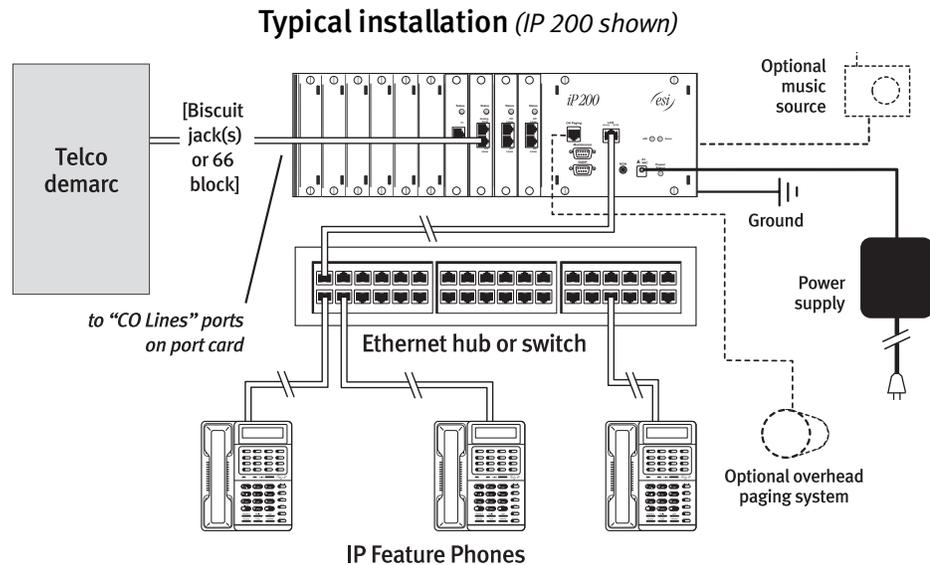
The IP PBX can be co-located in either the telephone equipment room or the data distribution rack.

Ambient room temperature must be between 40° and 80° Fahrenheit. Do not place the equipment near high-voltage electrical equipment or lines.

The IP 200 can be mounted in a 19" data rack by attaching the optional ears to the sides of the unit, at the front. These ears provide the necessary width to

allow the unit to be screwed into the uprights on the rack. When the ears are mounted to the sides of the unit, at the back, the IP 200 can be mounted on a wall. ESI recommends that the IP PBX be mounted on 3/4" or thicker plywood.

The IP 40 is significantly narrower than the IP 200. It is designed more as a tabletop model and therefore is not normally rack-mounted. However, an optional rack-mount kit provides ears that will allow the IP 40 to be mounted in a 19" data rack or on the wall.



Network design

The inherent design and construction of a data network will have a direct impact on the operation of an IP telephony system. Proper implementation of networking features and functions — *e.g.*, segmentation, available bandwidth and Quality of Service (QoS) — are crucial to the proper operation of IP telephony devices. Analysis tools such as *Esi-Networx* can be used as part of an overall network assessment to determine whether an existing data network is suitable for carrying IP telephony traffic.

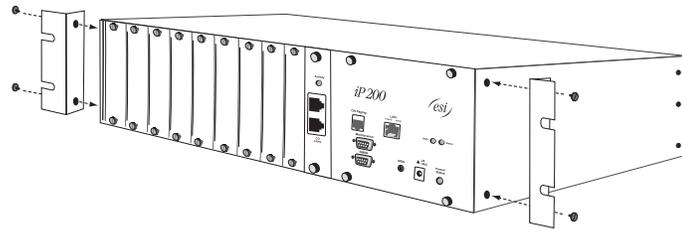
Site cabling requirements

Proper data network cabling is an important component of a reliable IP telephony installation. All cabling for the IP Series PBX and IP Feature Phones should meet IEEE 802.3 requirements or EIA/TIA 568B Commercial Building Telecommunications Cabling Standards:

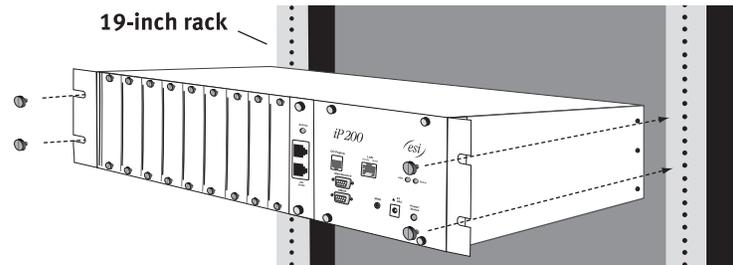
- If the IP Series PBX and IP Feature Phones are to be connected to a **100Base-T** Ethernet network, the cable length between the IP Feature Phone and the hub or switch cannot exceed 100 meters (approximately 328 feet). The IEEE 802.3 standard does allow up to two repeaters (Ethernet hubs or switches) for extending the distance to the IP Feature Phone.
- If the IP Series PBX and IP Feature Phones are to be connected to a **10Base-T** Ethernet network, the cable length between the IP Feature Phone and the hub or switch cannot exceed 600 feet. The distance can be extended with the addition of up to two repeaters (Ethernet hubs or switches).

Rack-mounting the IP 200

1. Screw the optional “ears” onto the **forward** side-screw receptacles of the IP 200 chassis.



2. Mount the IP 200 chassis on the rack.

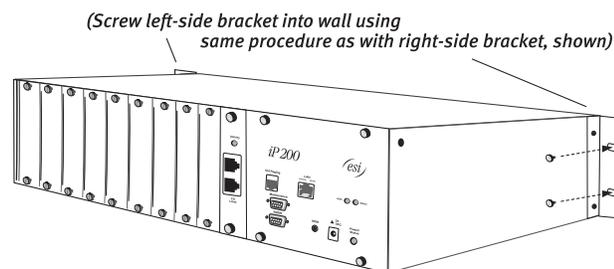


Wall-mounting the IP 200

1. Screw the optional “ears” onto the **rear** side-screw receptacles of the IP 200 chassis.

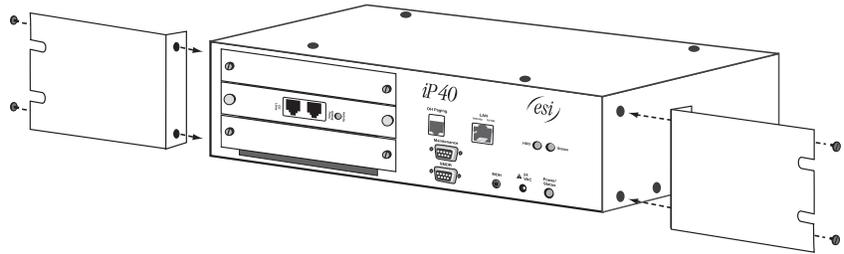


2. Mount the IP 200 chassis onto the wall.

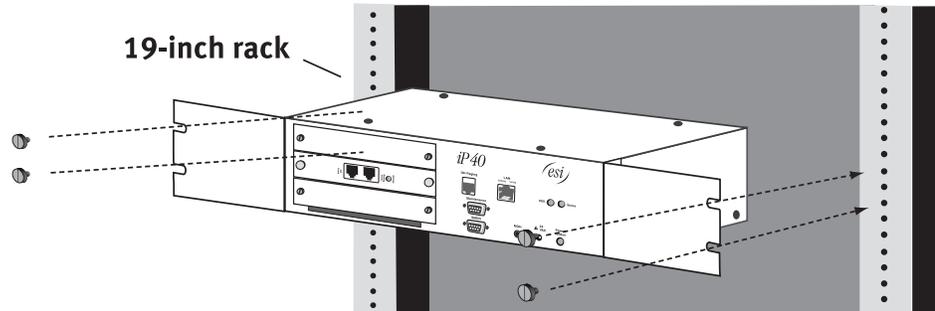


Rack-mounting the IP 40

1. Screw the optional “ears” onto the IP 40 chassis.



2. Mount the IP 40 chassis on the rack.



Port card installation/removal

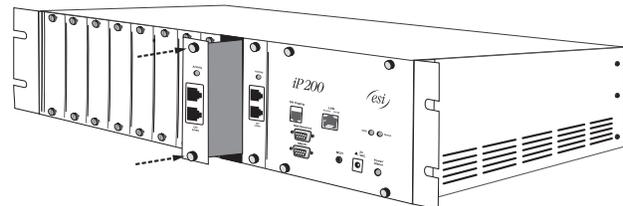
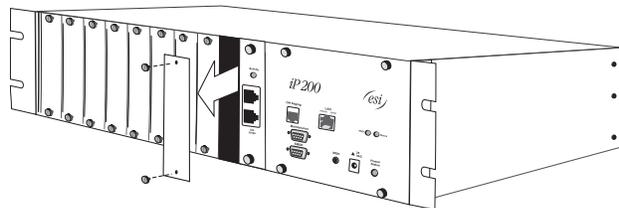
Adding or removing port cards will require that the system be powered off. Wear a grounding strap and avoid unnecessary movement while handling the circuit boards.

Unplug the power supply and any cables. Turn the thumbscrews counterclockwise to remove the IP module and the port cards. (Blank port covers will need to be removed with a Phillips screwdriver.)

IP 200

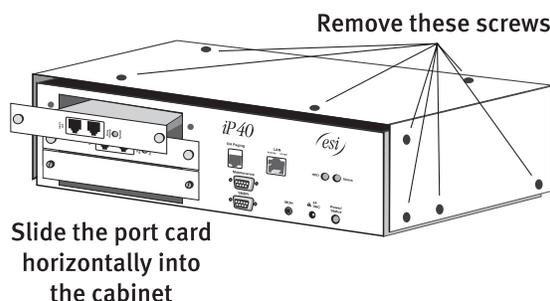
It will be necessary to give the port cards an initial tug to dislodge them from the backplane in the back of the unit. Similarly, when inserting the cards, give them a slight push to seat them in the backplane. Port cards must be installed starting from the rightmost card slot. **Don't** leave empty card slots between installed port cards.

The LNC in the IP module is connected to the backplane by a stiff cable. Remove the top panel of the IP 200 to expose the access hole in the top of the chassis. Carefully pull the module forward and reach in through the access hole to remove the cable from the card.



IP 40

The port cards are attached by individual cables to the Local Network Card in the IP system. Remove the screws holding the top cover to the chassis and lift the cover straight up. This will expose the interior of the IP 40, and the cables can be detached from the port cards and/or the LNC. The cables are keyed. The first port card's cable will be attached to J7 on the LNC. The second port card will attach to J8.



Memory Module

Note: The Memory Module has a proprietary formatting scheme – **do not** attempt to install a non-ESI drive.

Replacing the Memory Module will require that the system be powered off. Replacement Memory Modules are available only from ESI, and will include detailed installation instructions.

Replacing the Memory Module erases all its configuration data and customized recordings.

LED functions

The various LEDs on the IP 200, IP 40 and their port cards are designed to provide visual feedback as follows:

Power

The **Power** LED is located on the lower right-hand side of the front panel, just above the power connector interface. This LED glows red when power is being applied to the system.

Status

The **Status** LED indicates VoIP (voice-over-IP) activity. This LED is on the right-hand side of the front panel, just above the **Power** LED, and is lit continuously whenever VoIP packets are being transferred by the LNC.

HDD

The **HDD** (hard-disk-drive activity) LED is on the right-hand side of the front panel, just to the left of the VoIP activity LED. This LED flashes red whenever the Memory Module is being accessed.

Ethernet Link Integrity / 10/100 Mbps

This LED is actually a part of the RJ-45 Ethernet interface in the center of the IP module on the right-hand side of the front panel. It is commonly called a “link light.” This LED glows green when it senses 100 Mbps bandwidth, and red when it senses 10 Mbps bandwidth.

Activity LED (on LNC)

The LNC's **Activity** LED is a part of the RJ-45 Ethernet interface in the center of the IP module. This LED flashes red whenever there is Ethernet activity.

Activity LED (on other port cards)

Each port card provides a single red **Activity** LED that flashes whenever there is activity on that card.

External connections

Grounding instructions

The grounding conductor wires must be 16-gauge or larger, and either bare or covered with green or green-and-yellow jacket. Conductors and power receptacles must connect to earth ground at the service equipment (usually a cold-water pipe or copper ground rod). The grounding screw can be connected to either the side or the back of the IP PBX, depending on whether it is rack-mounted or wall-mounted. The supplemental ground must:

- Be used regardless of power cord ground.
- Be connected to the grounding screw on the IP 40 or IP 200.
- Retain ground connection when the IP PBX's external power supply is unplugged.

Note: IP PBXs' lines are protected against a 10KV surge only if the earth ground procedures described above are followed.

Power

IP PBXs

Each IP PBX requires a 110VAC outlet. Use only the 24VAC 3.0A Class 2 power supply module provided. A clean, isolated power source in conjunction with a UPS is required. A fully loaded IP 200 draws no more than 50 watts.

If AC power is interrupted, the system will drop all connections. When power is restored, the system will resume normal operations in about five minutes, having retained full programming and clock setting.

UPS

For system protection and to maintain uninterrupted operation, an uninterruptible power supply (UPS) is required. A UPS rated for 200 VA will provide approximately two hours of uninterrupted service for a fully loaded IP 200. Every 50 VA of capacity added to the UPS will yield about a half-hour of additional uptime.

MOH port

The MOH port (*message-on-hold* or *music-on-hold*) connector on the lower right-hand side of the IP PBX front panel is a standard $\frac{1}{8}$ " monophonic mini-jack, used for loading custom MOH recordings or for playing live music-on-hold from an external source such as a radio or CD player.

Serial ports

Two standard DB9F serial connectors are located on the lower right-hand side of the IP PBX. These ports use straight-through serial cables (not provided), one end of which should be terminated with a DB9M connector, to communicate with other devices.

The output from each serial port is 8 data bits, 1 stop bit, no parity. DTx is on pin 2, Rx is on pin 3, and ground is on pin 5. The bit rate is programmable via Function 18. The choices are 300, 1200, 2400, 4800, 9600, 19200, or 38400 bits per second. The default is 38400 bps.

SMDR Port (“Port 1” in programming)

Real-time SMDR call records are continuously output to the SMDR port.

Maintenance Port (“Port 2” in programming)

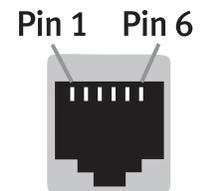
Connect a PC to this port via straight-through serial cable to conduct online programming and diagnostics. The reports generated by Function 7 are output to this port.

External paging device connection

A dry-contact overhead-paging device can be connected to the system through the RJ-11 overhead-paging connector on the front of the IP PBX. This connector is located just to the left of the RJ-45 Ethernet interface. Though this is a six-pin connector, only two pairs will be pulled from the OH paging device to the connector.

To pin out the connector for normally-open operation, connect the audio wires to pins 3 and 4, and the other pair to pins 1 and 2.

To pin out the connector for normally-closed operation, connect the audio wires to pins 3 and 4, and the other pair to pins 5 and 6.

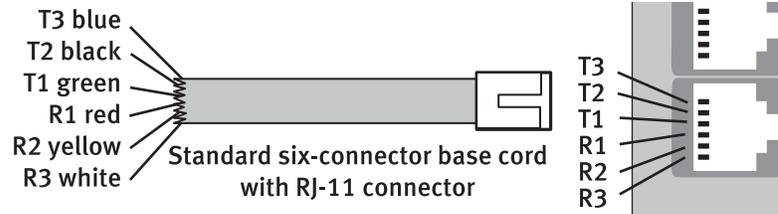


Ethernet connection

Connect a straight-through Category-5 (568A or 568B) cable from the RJ-45 connector labeled “Ethernet” to any non-uplink port on the data hub or switch. The link light on both devices will begin to glow green. If the IP PBX is already powered on, the 10/100 light will begin to flash red (10Mbps) or green (100Mbps). If IP phones are already on the network and powered on, the VoIP Activity LED will begin to flash.

Port cards

The IP Series port cards all use industry-standard RJ-11-type 6-pin or RJ-48-type 8-pin modular jacks for connection to CO lines, analog devices, T1 spans or ISDN/PRI. Analog device port cards and CO line port cards use standard RJ-11 pin-outs as shown:

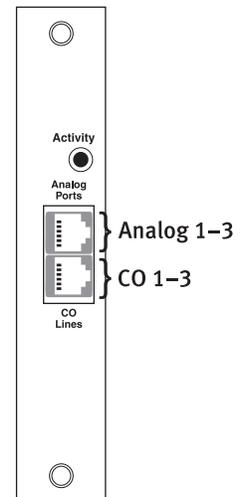


303 CO-and-analog port card

The 303 Card supports up to three CO loop-start lines and three analog devices. The advanced CO line circuitry provides open loop detection and Caller ID. Loop-start lines are connected to the 303 Card and the 600 Card through an RJ-11 connector.

The lower RJ-11 is used for loop-start CO lines and the upper RJ-11 is for analog devices. CO line 1 connects to pins 3 (tip) and 4 (ring); CO line 2 uses pins 2 and 5; and CO line 3 uses pins 1 and 6.

The upper RJ-11 connects to analog devices such as modems, fax machines and cordless phones. The RJ-11 pin pairs for the analog ports are: 3 and 4 for the first port; 2 and 5 for the second port; and 1 and 6 for the third.

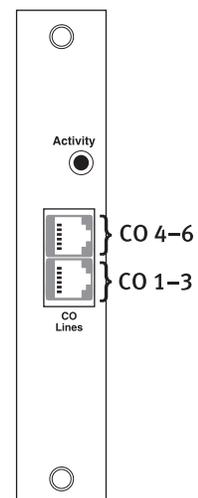


600 CO line port card

The 600 Card supports up to six loop-start CO lines on two RJ-11 connectors. The CO line circuitry provides open loop detection and Caller ID.

The lower RJ-11 connects CO lines to ports 1 through 3 on the following pin pairs, respectively: 3 and 4; 2 and 5; and 1 and 6.

The upper RJ-11 connects CO lines to ports 4 through 6 on the following pin pairs, respectively: 3 and 4; 2 and 5; and 1 and 6.



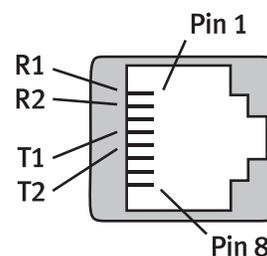
Digital Line Card (DLC)

Both T1 and PRI connections are supported by the DLC, which is configured for either T1 or PRI when installed; see the document, *Digital Line Card Configuration Instructions* (#0450-0295), for configuration instructions. The IP 200 can support up to two DLCs, the IP 40 up to one.

In T1 mode, the DLC supports up to 24 CO line interfaces (channels). It can be configured to support loop-start, ground-start, E&M or E&M DNIS/DID signaling types.

When configured for PRI, the DLC supports up to 23 digital B (bearer) channels. Supported signaling protocols include National NI2, Lucent 5ESS, Nortel DMS100 and Siemens EWSD.

The DLC uses a four-wire connection via the front-panel RJ-48 jack. The two “receive” wires use pins 1 and 2, and the two “transmit” wires use pins 4 and 5, of the RJ-48 connector. The DLC incorporates an on-board CSU, and can be connected directly to a Smart Jack or other telco network interface.

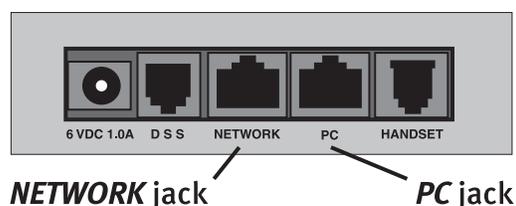


Station connection

Stations connect to the Ethernet cable at the desktop. The IP Feature Phone has two RJ-45 interfaces, located on the bottom of the instrument. Use the supplied Ethernet cable to connect the port marked *NETWORK* to the cable run jack (*LAM*). If needed, connect the user’s workstation Ethernet cable to the port marked *PC*.

Note: The IP Phone does **not** receive power through the Ethernet cable. Remember to plug in the power supply.

Jacks on bottom of IP Feature Phone



64-key Expansion Console connection

The IP version of the 64-Key Expansion Console plugs into the port labeled *DSS* on the bottom of the IP Phone, using the supplied cable. No other connection is needed. The console draws its power from the IP Phone’s power supply through the cable. Up to 20 Expansion Consoles can be installed.

TAPI phone installation

The IP Feature Phone is already TAPI-compliant; and ESI provides TAPI drivers (for Windows 95, 98, NT and 2000) as a free download from the ESI resellers’ Web site (www.esiresellers.com). The ESI TAPI drivers have been tested with *Act!*[®], *Microsoft® Outlook*[®], *Goldmine*[®] and *Callaudit Client*.

The IP Feature Phone must be inline between the PC and the network in order to use TAPI.

Remote IP Feature Phone installation

(See the *Remote Phone IP Feature Phone Installation Manual* [#0450-0263]; it is included on the CD-ROM packed with the Remote IP Feature Phone.)

System programming: an introduction

You can program the IP Series either from an IP Feature Phone or through the Windows® 95/98-based Esi-Access package. Both methods follow the same programming steps. This manual focuses on programming from an IP Feature Phone; the respective documentation for *Esi-Access* details the differences in programming from that environment.

Read the User's Guide first. Programming features require a clear understanding of the user interface and application.

You can program the IP Series system from any IP Feature Phone while the system is operating. Once you've accessed programming mode, the system will prompt for — and confirm — each keystroke action via voice commands and the LCD display. You program both configuration data and recordings in the same manner.

Programming keys

During programming, the top line of the LCD will display the current **item** being programmed and the bottom line will be the **entry** line. You can enter values as directed by the combination of the voice prompts and LCD display. To enter multiple values, such as a list of extension numbers, separate each value by # (to exit the list, enter # #).

To...	Press ...	What this does
Enter	#	Confirms new or existing entry and advances to next programming step.
Back up (i.e., reverse direction)	*	Backs up to previous prompt without changing its value.
Delete	HOLD	Deletes data or recording.
Exit	RELEASE (or just hang up)	Exits programming mode and removes extension from DND.
Help	HELP	Provides more detailed instructions during programming.
Select / Scroll	▼ (left-side scroll key)	<ul style="list-style-type: none"> • During entry of a value, backs up • If a list is present (▶ is displayed), scrolls to left
	▲ (right-side scroll key)	<ul style="list-style-type: none"> • Selects from options presented • If a list is present (▶ is displayed), scrolls to right • Inserts a space during entry of a name.

Note: Either < or > in the display indicates that additional choices or values are available by pressing a corresponding scroll (▼ or ▲) key.

Entering alphanumeric characters

You enter names for **extensions**, **departments**, **branch IDs** and **CO lines** by pressing the dial pad key that corresponds to the character to be entered. The key's possible entries will change each time the key is pressed, and the LCD will show this. When the LCD displays the desired character, press **#** to confirm; the cursor will move to the next character position. You may move the cursor left (to correct an entry) by pressing the left scroll key (▼) or move right (to add a space) by pressing the right scroll key (▲).

Key entry	Options
0	0, - (hyphen), _ (underline)
1	Q, Z, 1, " " (space)
2	A, B, C, 2
3	D, E, F, 3
4	G, H, I, 4
5	J, K, L, 5
6	M, N, O, 6
7	P, R, S, 7
8	T, U, V, 8
9	W, X, Y, 9
▼ (left scroll key)	Backs up and erases
▲ (right scroll key)	Adds a space
#	[Enter]
# #	Ends the name

Example: To enter a *B*, press **2** twice (the possible options to **scroll** through are **A**, **B**, **C** and **2**). When **B** is displayed, press **#** to confirm; the cursor will move to the next character to be entered. To complete the name, press **# #**.

System fixed numbering plan

Number		Function
<i>IP 200</i>	<i>IP 40</i>	
0	Same	Operator
1–66	1–30	CO lines
100–195	100–127	IP Feature Phone stations
199	Same	Overhead paging port
200–229	200–205	Analog stations
290–299	Same	Department pilots
300–489	Same	Guest/info mailboxes
490–499	Same	Q & A mailboxes
500	Same	Broadcast mailbox
501–516	Same	Group mailboxes
520–529	Same	Cascade paging mailboxes
530–550	Same	Recordable system prompts
560–589	Same	Feature codes
590–598	Same	MOH recordings
600–699	Same	System speed dial
700–799	Same	Remote IP PBX numbers (Esi-Link only)

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Entering Installer programming mode

You may program from **any** Feature Phone in the system. To enter programming mode:

1. Press **PROG/HELP**. The normal **station** programming menu prompt will begin to play.
2. Press **PARK** to stop the prompt.
3. Enter the Installer password, followed by #.
4. Follow the **system** programming menu.
5. When finished, hang up.

Note: While in programming mode, the extension will be automatically placed in DND.

Note: The system will automatically exit programming mode after 10 minutes of inactivity.

<p>Example: To enter programming mode, press PROG/HELP, PARK, 7 8 9 [or new Installer password], #. To exit programming mode, hang up.</p>

Accessing user station programming

Should a user forget his password or if an employee leaves the organization, this feature allows the Installer or Administrator to enter a user's station programming and operate within it as if he were the user. From the user's station, enter the **Installer** or **Administrator** password when the system prompts for the **user** password.

Example: From station 105, entering **7 8 9 #** or **4 5 6 #** instead of the user password (**1 0 5 #**) will enter the station's user programming. (Default passwords shown for this example).

(This page included for pagination purposes only.)

Function 1: System parameters

Function 11: Initialize

This function will return all components and software to their initial state. Initialization will erase all data and custom recordings.

Important: Always initialize the system before initial programming for a new installation.

Important: The command to initialize must be confirmed by entering the Installer password when prompted.

System initialization will take up to five minutes to complete. When completed, the phone's display will return to the idle state. **You must then re-access Programming Mode** by following the steps described earlier (see page C.5).

Functions 12 and 13: Installer and Administrator passwords

These functions will display the existing password and prompt for input of a new password. The passwords can be 2–8 digits long, followed by #. **The Installer can change either the Installer or Administrator Password.** The default passwords are:

Installer Password (Function 12) = 7 8 9

Administrator Password (Function 13) = 4 5 6

Note: Be sure to write down the new passwords, store them in a safe place and give the new Administrator's Password to the Administrator.

Note: You can use either the Installer or Administrator password to access a user's station programming. At the station, when prompted for the user's password, enter either the Installer or Administrator password, then follow normal user programming procedures.

Function 14: Set time/date

1. Enter a new time in a **twelve**-hour format.

Example: Enter 1 2 3 3 for 12:33, or 3 1 5 for 3:15 (note that you need **no** leading zero for the time).

2. Select AM or PM by pressing a scroll key (either ▼ or ▲).
3. Enter a new date in an **eight-digit** format, **including** leading zeroes.

Example: Enter 0 7 0 4 2 0 0 1 for July 4, 2001 (note that leading zeroes **are** required here, unlike in step 1).

4. Press # to finish the entry.

Note: A built-in battery maintains the correct time and date, even in the event of a power loss.

Function 15: System timing parameters

Function 151: Flash hook duration

This sets the time (in tenths of a second) that a flash hook will be sent on the current line to the telco. The default setting of **15** (1.5 seconds) will cause disconnect and fresh dial tone from the CO.

Range: 2–20 (0.2–2.0 seconds).

Default: 15 (1.5 seconds).

Function 152: Transfer forward timer

This sets the number of times a transferred call will ring before following the extension's or department group's day/night routing (typically to the extension's mailbox).

Range: 1–9 rings.

Default: 3.

Function 153: Recall timers

Function 1531: Hold recall timer

This is the amount of time, in seconds, that a call will remain on hold before recalling to the extension that initiated the hold.

Range: 5–960 seconds.

Default: 60 seconds.

Function 1532: Park recall timer

This is the amount of time, in seconds, that a call will remain on park before recalling to the extension that initiated the park.

Range: 5–960 seconds.

Default: 60 seconds.

Function 154: ACD exit timer

This is the amount of time, in seconds, that a call will remain in ACD department queues before following the department reroute (see Function 33, page F.11).

Range: 5–600 seconds (or 0 for no limit).

Default: 180.

Function 155: ACD wrap timer

This is the maximum amount of time, in seconds, that an agent can remain in wrap mode (*i.e.*, temporarily out of queue). If this function is turned off, agents cannot place their stations in wrap mode (see *User's Guide*, "ACD agent operation").

Range: 5–600 seconds (0 for no limit).

Default: 0 (no limit).

Function 156: Cell phone delay

When one uses a cellular phone or cordless phone to pick up messages, this usually requires the user to move the phone away from the ear frequently in order to press command keys, making the user miss some portion of the next prompt. This function adds additional delay before the playback of system prompts during remote message pickup or message pickup from an analog station (*this does not affect IP Feature Phone message pickup*). The value is in tenths of a second.

Range: 0–50 (0.0–5.0 seconds).

Default: 10 (1.0 second).

Function 16: System feature parameters

Function 161: Recording alert tone

This sets whether the system plays a short beep every 15 seconds during a call recording, indicating to both parties that a recording is in progress.

Default: Disabled (the beep does not play).

Important: IN MOST JURISDICTIONS, IT IS PERMISSIBLE TO RECORD A CONVERSATION IF ONE OF THE TWO PARTIES IS AWARE THAT IT IS BEING RECORDED. HOWEVER, ESI (ESTECH SYSTEMS, INC.) TAKES NO RESPONSIBILITY AS TO ITS LEGALITY IN ALL JURISDICTIONS. IT IS THE RESPONSIBILITY OF THE INSTALLING COMPANY AND THE END USER TO DETERMINE AND FOLLOW THE APPLICABLE STATE AND LOCAL LAWS REGARDING RECORDING OF CONVERSATIONS.

Function 162: Connect tone

This sets whether the system plays a system connect tone (the two short beeps a user hears when a station answers).

Default: Enabled (the beeps play).

Function 163: System-wide hold

Used in conjunction with station CO line key appearances. This function — when enabled — allows station users to press the **HOLD** key to place a caller on hold so that any station programmed with CO line key appearances can retrieve the call. After the user presses **HOLD**, the caller's CO line will blink green at the station placing the call on hold and red at all other stations. Any user who has a key blinking due to this call can retrieve the call from hold by pressing the blinking key. (For stations without line key appearances, placing a caller on hold puts him on exclusive hold only.)

Default: Disabled.

Function 17: System speed-dial

Up to 100 system speed-dial names and associated numbers can be stored, in location numbers 600–699, for access by any station. A user can initiate a system speed-dial by dialing the speed-dial location number or by accessing the name through the Esi-Dex feature. However, system speed-dials don't follow toll restriction. In Function 32, access to system speed-dial can be denied to individual stations (see page F.10).

1. Enter the 3-digit location number to program.
2. Enter a **one- to ten-character** name (see “Entering alphanumeric characters,” page C.2).

3. Enter the number to be dialed (including the line group — 9, 8 or 71–76). Press the left scroll key (▼) to delete any character or digit entered in error. Here’s an example:

1.	2.	3.
Location no.	Name	Number
601	AUTO RENTL	915552221212

The number dialed in step 3 can be up to 30 digits long **including** the following special codes:

Code	What it produces
#	# DTMF tone
*	* DTMF tone
F	Flash hook
P	2-second pause

To insert a special code, press the right scroll key to select the desired special code: #, *, F or P. Press # to confirm the inserted character and continue. Press ## to complete the entry.

Example: To create a System Speed Dial number that dials 9, then 972-555-5644, then pauses for 4 seconds and finally dials #104, enter:
9 9 7 2 5 5 5 6 4 4 (scroll to) P # (scroll to) P # (scroll to) “#” # 1 0 4 #

Deleting a speed dial number

To delete an entire speed dial number and name, delete the location number (6 XX) by pressing **HOLD** or the left scroll key (▼) during step 1 in the speed-dialing procedure described above.

Function 18: Serial maintenance port baud rate

The system’s serial ports are dedicated to SMDR and maintenance.

Range: Programmable for 300, 1,200, 2,400, 4,800, 9,600, 19,200, or 38,400 bps.

Default: 38,400 bps.

SMDR port

(Called “Port 1” in the display.) Real-time SMDR call records are continuously output to the SMDR port.

Maintenance port

(Called “Port 2” in the display.) A laptop PC can be connected to this port for on-line programming and diagnostics. Reports generated in Function 7 are also output to this port.

Programming steps

1. Select the port by pressing a scroll key (▼ or ▲) until the desired port is displayed.
2. Press # to confirm.
3. Select the baud rate by pressing a scroll key (▼ or ▲) until the desired rate is displayed.
4. Press # to confirm.

Function 2: CO lines

The IP Series system can operate on a station-by-station basis as a PBX or as a combined key/PBX system using standard loop start lines. If a station has line keys programmed, the user accesses the lines by pressing one of these keys **or** by dialing **9** (or **8** or **71–76**). If a station does **not** have line keys programmed, the user **always** accesses CO lines by dialing **9** (or **8** or **71–76**).

Note: To provide additional visual indication of CO line usage, an idle phone's LCD will show on/off-hook line status.

Since the system handles call transfer and auto attendant functions efficiently, operating in the PBX mode provides more programmable feature keys for other uses and the opportunity for glare is greatly reduced.

Note: All phone programmable keys (except x100; its first key is a day/night key [see page G.5]) are defaulted as not being programmed. Use *extension button mapping* (Function 35; see page F.13) to assign line keys system-wide; for individual stations, refer to the *User's Guide*.

Important: Where any **gray shading** (■) appears in an example, it represents values either **unavailable** to the function or **unused** in the particular example.

Function 21: CO line programming

This function allows you to program analog, T1 or PRI COs:

CO PROGRAMMING
1=ALG 2=T1 3=PRI

Enter **1** for analog CO programming, **2** for T1 CO line programming or **3** for PRI CO line programming. When you modify the system configuration by changing cards, CO lines will need to be re-programmed. Default answer ring assignment for CO lines is *ID1*.

- The CO lines are numbered 1–66. You can connect up to 60 loop-start CO lines to the system if it has 303 or 600 port cards installed (six lines on each port card). You can connect up to 66 lines if the system has one or more DLC cards; lines installed via T1 can be loop, ground, E&M, or DID.
- All CO lines are programmed to route callers during the day mode and then can be programmed to route callers differently during the night mode. The display will show “D” or “N” to distinguish which mode is currently being programmed. Lines that are to be programmed alike can be *grouped* to simplify programming.

Example: Here is a completed Programming Worksheet for incoming calls on Line 1 that are to ring live to Extension 100 but finally get answered by the auto attendant's main greeting after nine rings. (The step numbers correspond to the following explanation.)

1. CO	2. Name	2. OUT	4. Ring 1	Ring 3	Ring 5	Ring 9
1	CO line 1	9	X100	X100	X100	ID1

Choose CO lines to program

During this step, you use the 16 programmable keys to represent CO lines. Select lines to be programmed by pressing one or more of the programmable keys. Press the scroll keys to “page” to lines 17–32, 33–48, 49–64 and 65–66. The display will indicate “LINES 1 TO 16,” “LINES 17 TO 32,” etc., to indicate which CO lines the programmable keys currently represent.

Select the line keys to be programmed alike by pressing one or more programmable keys (a selected key’s LED grows **green**), and then pressing **#** to confirm. After programming the steps outlined in the discussion for these keys (programmed keys’ LEDs will glow **green**), select additional line keys to program alike, until all required lines have been programmed (and their keys’ LEDs glow **green**.)

T1 lines: special note

If a DLC configured for T1 is installed, an extra programming step will be required to select the line type. When a programmable key is pressed to select it for programming as described above, the display will show “LOOP”; continuing to press the same key will cycle the display through the following:

- E&M DNIS/DID
- E&M
- LOOP START
- GROUND START

Once you select the correct type, continue to additional lines and proceed with the programming.

PRI: special note

If you are programming channels on a DLC configured for PRI, you will not be able to select the line key for channel 24; this is a dedicated channel of the span for signaling purposes. However, because channel 24 will use a port, the next card in the system will still start at CO 25 if the DLC is the first card in the system.

Naming the CO lines

During this step, you can name the CO lines you are programming. Each name can contain up to 10 alphanumeric characters. This step is **optional**.

If you press **#** during this step, the default names (*e.g.*, Line 1, Line 2, etc.) will be retained.

If you select multiple CO lines to program, the name field will be left blank; you can either press **#** at this point to keep all of the lines’ default names **or**, by entering a name, assign the same name to all selected CO lines.

If you want to change an already programmed name to the default value, press **HOLD** to delete the name and then press **#** while the field is blank; this restores the default values for all selected lines.

If used in conjunction with Caller ID, this feature causes the Caller ID name to appear on the top line, and the CO line name on the bottom line, for five seconds after someone answers a call on that line. After that, a call timer appears on the top line’s right side and, on the bottom line, the CO line name is replaced by the usual lines-in-use display.

If Caller ID is not enabled, the CO name will appear on the top line of the display and the CO line use indications will be on the bottom line.

Default: Line numbers.

Outbound CO line groups

Note: A line can be (a) in one line group, (b) designated as a private line or (c) not assigned.

Outgoing lines, if selected by dialing **9, 8** or **71–76**, will be assigned in order from the highest numbered CO line to the lowest available in the line group. If a CO line is not assigned to a line group or designated as a private line, it will be an inbound-only line and set to Line Group 0 (press **HOLD** to delete the line group number).

Default: All CO lines are in Line Group 9.

Private line

You can designate a line as a **private line** by entering an extension number (instead of a line group number) in this step. The line is then programmed as outlined in the following explanation, giving the private line great flexibility for handling call routing.

Note: A private line can be assigned only to a Digital Feature Phone. A line key must be programmed on the phone for the phone to access the line for outgoing calls. (Programming this line on a second phone allows that phone only to monitor whether the line is in use.)

PRI: special note

Because of the dynamic channel allocation on a PRI span, there is no way to prevent inbound traffic on any particular channel.

Answer ring assignment

Lines can be directed to be answered at up to 10 extensions, or a department (up to 32 extensions), a mailbox or an auto attendant branch ID (see “Auto attendant programming,” pages G.1–G.7); select these with the scroll keys. The destination can be set to add or drop extensions, departments, mailboxes or IDs if ringing continues due to no answer.

Example: First ring — Line 1 will ring at the operator’s extension.
 Third ring — Extensions 112 and 113 are added.
 Fifth ring — The operator’s station is dropped from ringing.
 Ninth ring — The call will be answered by the auto attendant.

CO	Name	OUT	Ring 1	Ring 3	Ring 5	Ring 9
1	CO Line 1	9	X100	X100 X112 X113	X112 X113	ID1

Once you have programmed all desired CO lines for day mode, repeat the programming steps for all desired CO lines for night mode.

Default: Answer on Ring 1 with ID1 (main greeting), in both day and night modes.

Example: To have after-hour calls directed to a general delivery mailbox, program the system as follows:
 During night mode, line 1 (and other lines to be programmed alike) will be answered immediately by MB401 (a guest mailbox set up for general delivery). The personal greeting for MB401 might be:
“Hello. Thank you for calling XYZ Company. Our offices are closed. Our normal business hours are 8 AM to 5 PM Monday through Friday. Please leave a message at the tone and we will return your call at the earliest opportunity.”
 A Virtual Mailbox Key programmed at the operator’s phone will allow easy pickup of calls left during the night.

Night mode

CO	Name	OUT	Ring 1	Ring 3	Ring 5	Ring 9
1	CO Line 1	9	MB401			

Note: CO line groups aren’t programmable from night mode.

Function 211: Analog CO line programming

This function allows you to program the analog COs for both day and night mode. You can select the trunk groups and ring assignments for a group of COs or individual lines.

Select the COs to be programmed

Software will identify the port card type installed in each slot. The LCD will show the following information: the first line will show the port card number, the type of card, the COs available to program and a *D* or *N* for day or night mode. The second line will show the CO currently selected and the circuit that is being programmed. The appropriate DSS lights will light red to indicate the lines available to program.

If the port card in the first slot is a 600, the display will be:

```
PC1 600 1-6   D
CO1 CIRCUIT 1 >
```

If the port card in the third slot is a 303, the display will be:

```
PC3 303 13-18 N
CO16 CIRCUIT 4 >
```

In both examples, the first six DSS LEDs glow red. Select the COs to program alike (you can scroll to select the next port card and continue to select COs to be programmed alike) and press the # key to confirm. The LEDs will now glow green.

Enter name

(For more details, see “Naming the CO lines,” page E.2.)
 Once you’ve entered the name, press # to confirm.

Outbound CO line groups

Select the line group — 9, 8, 71, 72, 73, 74, 75 or 76 — and press # to confirm. Outgoing calls will be assigned from the highest CO to the lowest available. The default is 9. You can designate a private line by entering an extension number, instead of a line group, in this step.

Answer ring assignment

Lines can be programmed with 4 different ring assignments, Ring 1, Ring 3, Ring 5 and Ring 9. Each Ring count can be programmed for up to 10 extensions, a department, a mailbox or an auto attendant branch ID. After all lines are programmed for day mode, the steps are repeated for night mode. After the COs are programmed, the LED will glow amber.

Function 212: T1 programming (DLC)

This function allows you to program the trunks and line parameters for the DLC. The system will identify the number of DLCs installed (one or two cards) and allow you to scroll through the 24 channels on each port card.

T1 PROGRAMMING

Note: If two cards are used in a single system, the first card will sync with the network and become the source clock for the system. For best results, any fax or modem devices on analog ports should use lines from the first card.

Function 2121: CO line programming

Software has identified the port card type installed as a DLC configured for T1. The display will show the following information: the first line will show the port card number, the type of card, the COs available to program and a *D* or *N* for day or night mode. The second line will show the CO currently selected and the circuit that is being programmed. If multiple COs are selected, then the last CO selected is displayed. All DSS LEDs will glow red until selected for programming.

You can select from the first set of 16 COs, and then press the scroll key to select from the remaining eight CO lines on the first port card. Scrolling again will allow you to select the 16 COs on a second port card if one is installed, and scrolling again will allow you to select from the eight remaining COs. If there is only one port card installed, then scrolling will return you to the first 16 COs. Select the COs to program alike and press # to confirm. The LED will glow green and then, after a CO is programmed, the LED will glow amber. After the selected COs are programmed, the LED will glow amber.

For example: if the port card in the third slot is a DLC configured for T1, the display will be:

**PC3 T1 13-36 D
CO22 CIRCUIT 10>**

Enter the CO line name (for more details, see “Naming the CO lines,” page E.2.) and then press # to confirm.

Use the scroll keys to select the **trunk type emulation**: either *E&M DNIS/DID*, *E&M*, *LOOP START* or *GROUND START*. Press # to confirm. (Default is *E&M DNIS/DID*.)

**TRUNK EMULATION
E&M DNIS/DID >**

If LOOP START or GROUND START is selected:

Continue with the outbound CO line groups and answer ring assignment.

If E&M DNIS/DID is selected:

The lines are routed to the DNIS/DID table (programmed in Function 224). After the E&M programming is complete, select the outbound CO line groups.

If E&M is selected:

The lines are routed to the answer ring assignment.

To allow for maximum flexibility, the DLC will allow you to select E&M without DID/DNIS outputs. This is not a typical application, but can be supported with the understanding that E&M doesn't ring. Therefore, route the answer ring assignments to an ID branch to be answered by the auto attendant, because no routing digits will come into the translation table. We recommend loop or ground start trunks for this application.

Channels that are programmed as E&M DID/DNIS can receive ANI (Automatic Number Identification service; it provides the phone number of only the party calling in). This is supported on only E&M DID/DNIS channels and must be provided by the carrier. If the carrier can provide ANI, it needs to send this string: “*ANI*DID or DNIS*.” This will enable the system to display the ANI on the LCD of each Digital Feature Phone and route the call according to the DID/DNIS routing table.

Note: Not all carriers can support this function.

After the E&M programming is complete, select the outbound CO line groups and assign the ID branch to answer.

To **complete** the programming of the E&M trunks selected:

1. Use the scroll keys to select the **outgoing signal type** — *WINK START*, *IMMEDIATE START* or *DIAL TONE START*. Press # to confirm. Default is *WINK START*.

```
OUTGOING SIGNAL
DIAL TONE START>
```

2. Use the scroll keys to select the **incoming signal type** — either *WINK START* or *IMMEDIATE START*. Press # to confirm. Default is *WINK START*.

```
INCOMING SIGNAL
IMMEDIATE START>
```

3. Use the scroll keys to select the **trunk mode** — *2-WAY TRAFFIC*, *INBOUND ONLY* or *OUTBOUND ONLY*. Press # to confirm. Default is *2-WAY TRAFFIC*.

```
TRUNK MODE
2-WAY TRAFFIC >
```

4. Use the scroll keys to set **dial tone transmit** to either *OFF* or *ON*. Press # to confirm. Default is *OFF*.

```
DIAL TONE TRANS.
OFF >
```

5. Use the scroll keys to set **ringback transmission** to either *OFF* or *ON*. Press # to confirm. Default is *OFF*.

```
RINGBACK TRANS.
OFF >
```

Outbound CO line groups

Select the line group — 9, 8, 71, 72, 73, 74, 75 or 76 — and press # to confirm. Outgoing calls will be assigned from the highest CO to the lowest available. Default is 9. (You can designate a private line by entering an extension number instead of a line group in this step or 0 for incoming-only line.)

Answer ring assignment

Lines can be programmed with four different ring assignments — Ring 1, Ring 3, Ring 5 and Ring 9. Each ring count can be programmed for up to 10 extensions, a department, a mailbox or an auto attendant branch ID. After all lines are programmed for day mode, the system prompts for only the answer ring assignment step for night mode.

Function 2122: T1 frame format and line coding

Use the scroll keys to select the frame format and line coding — either *ESF/B8ZS*, *SF/AMI*, *ESF/AMI* or *SF/B8ZS*. Press # to confirm. Default is *ESF/B8ZS*.

```
P-CARD 3    T1
FF/LC ESF/B8ZS >
```

If a second T1 port card is installed, the system will alternate to the next port card. Use the scroll keys to select the frame format and line coding. Press # to confirm.

Function 2123: Line build-out

This function allows you to adjust the line build-out of the T1 port card. The level programmed depends on the application (CSU or DSX-1) indicated in the following table.

Level	CSU line build-out	DSX-1 line build-out
1	0 dB	0 to 133 feet
2	N/A	133 to 266 feet
3	N/A	266 to 399 feet
4	N/A	399 to 533 feet
5	N/A	533 to 655 feet
6	-7.5 dB	N/A
7	-15 dB	N/A
8	-22.5 dB	N/A

Use the scroll keys to select the line build-out and press # to confirm. Default is 1.

If a second T1 port card is installed, the system will alternate to the next port card. Select the line build out with the scroll key. Press # to confirm.

Function 2124: CSU emulation

Use the scroll keys to toggle between enabled and disabled. **Default:** Off. If there is no external CSU, the CSU Emulation setting should be set to On but the remaining options should be left at the default setting of Off. When CSU emulation is enabled, the following test options will be available and **should be used only at the request of the carrier**.

Test option*	Description	Options	Default
ATT PRF	Loopback test per AT&T spec 62411 for performance assessments, sent to the carrier on ESF trunks only.	On/Off	Off
ANSI PRM	Loopback test per ANSI spec T1.403 for performance assessments, sent to the carrier on ESF trunks only.	On/Off	Off
PLB	(Payload loopback.) Accepts signal from the carrier at the chip level, puts it through the framer (de-frames and re-frames signal with data staying the same) and sends it back to the carrier. Used to determine whether the chip itself is functioning correctly.	On/Off	Off
LLB	(Line loopback.) Sends the signal back right at the point it enters the chip before it enters the framer. Helps determine whether the line itself is good.	On/Off	Off
NET LLB	(Network loopback.) Lets the carrier put the DLC's CSU into any of the loopback modes.	On/Off	Off

* Test options available only when CSU emulation is set to On.

Warning: The default setting is **Off** for those systems using an external CSU. If there is no external CSU, the CSU Emulation setting should be set to *On* but the remaining options should be left at the default of *Off*. **Use these other settings ONLY at the request of your carrier or the phone system manufacturer for testing purposes.**

Function 213: PRI programming

The options under Function 213 are used to program a DLC configured as an ISDN PRI card with 23 B channels and one data channel (the 24th) called the “D” channel. The first line of the display will indicate the card number and the type of card. The frame format and line coding will default to the ISDN standard of ESF/B8ZS.

One of the main features of PRI is *dynamic channel allocation* — *i.e.*, all telephone numbers on the PRI span can come in over any of the 23 channels. This eliminates the need to forecast call volume for the main published number, because as few as one channel or as many as 23 channels can be occupied at any time by calls to the main published number. For example: channels 1–20 can be occupied by calls to the main published number while channels 21–23 are open or occupied with DID calls; later, channels 1–15 can be occupied by DID callers while channels 16–23 are open or occupied by callers to the main number.

The components required for programming are CO line programming (Function 2131) and switch protocol (Function 2134). In addition to the required fields, there also are fields for line build-out (Function 2132), CSU emulation (Function 2133) and DID enable/disable (Function 2135) that typically are omitted by default.

Function 2131: PRI CO line programming

The 23 voice channels support both inbound and outbound traffic. There must be answer ring assignments for both daytime and nighttime routing. This routing will be followed only if DID is enabled. Because the dynamic channel allocation on PRI, there is no control over the channel any given number rings in on. For this reason, we recommend that you route all channels the same. For maximum flexibility, the ESI IP Series systems allow each channel to be selected individually. For example: in some case, the outbound line group needs to be different or, perhaps, to have the first five channels be live-answer and then send the overflow to ID 1.

When performing the CO line programming, remember that there are only 23 channels; because the 24th is used for signaling, it doesn’t take up a port and it needs no programming. If the DLC (configured for PRI) is in Slot 1, the COs will be 1–23 and the next card will start with CO 24.

1. Using the programmable feature keys, select the line keys to be programmed (use the scroll keys to select lines 1–23), then press # to confirm.
2. Select *Dialtone transmit off/on*. **Default:** Off.
3. Select *Playback transmit off/on*. **Default:** Off.
4. Enter the CO name (see “Entering alphanumeric characters,” page C.2).
5. Enter the CO line group (9, 8 or 71–76).
6. Make answer ring assignments: Ring 1, Ring 3, Ring 5 and Ring 9. Each ring count can be programmed for up to 10 extensions, a department, a mailbox or an ID branch.

Note: After you program a ring assignment for a department, mailbox or ID branch, no remaining ring assignments will be required because, upon reaching any of these, the call is considered answered.

Example:	Ring 1	Ring 3	Ring 5	Ring 9
	X100	X100, X101, X102	ID1	Not used (system won’t prompt you to program)

7. Repeat steps 1–6 for night programming.

Function 2132: Line Build Out

Use the arrow keys to select a value of 1–8. Press # to confirm. **Default:** 1.

The level programmed depends on the application (CSU or DSX-1) indicated in the following table:

Level	CSU line build-out	DSX-1 line build-out
1	0 dB	0 to 133 feet
2	N/A	133 to 266 feet
3	N/A	266 to 399 feet
4	N/A	399 to 533 feet
5	N/A	533 to 655 feet
6	-7.5 dB	N/A
7	-15 dB	N/A
8	-22.5 dB	N/A

Function 2133: CSU Emulation

Use the scroll keys to toggle between enabled and disabled. **Default:** Off. If there is no external CSU, the CSU Emulation setting should be set to On but the remaining options should be left at the default setting of On. When CSU emulation is enabled, the following test options will be available and **should be used only at the request of the carrier:**

Test option*	Description	Options	Default
ATT PRF	Loopback test per AT&T spec 62411 for performance assessments, sent to the carrier on ESF trunks only.	On/Off	Off
ANSI PRM	Loopback test per ANSI spec T1.403 for performance assessments, sent to the carrier on ESF trunks only.	On/Off	Off
PLB	(Payload loopback.) Accepts signal from the carrier at the chip level, puts it through the framer (de-frames and re-frames signal with data staying the same) and sends it back to the carrier. Used to determine whether the chip itself is functioning correctly.	On/Off	Off
LLB	(Line loopback.) Sends the signal back right at the point it enters the chip before it enters the framer. Helps determine whether the line itself is good.	On/Off	Off
NET LLB	(Network loopback.) Lets the carrier put the DLC's CSU into any of the loopback modes.	On/Off	Off

* Test options available only when CSU emulation is set to On.

Warning: The default setting is **Off** for those systems using an external CSU. If there is no external CSU, the CSU Emulation setting should be set to *On* but the remaining options should be left at the default of *Off*. **Use these other settings ONLY at the request of your carrier or the phone system manufacturer for testing purposes.**

Function 2134: Switch protocol selection

Use the scroll keys to select from the four switch options for your carrier.

- Nortel – DMS100
- AT&T/Lucent – 5ESS
- National/NI2 - Default
- Siemens - EWSD

Note: Most switches can emulate the various protocols. Please be sure to base your selection on the protocol actually being used rather than the identity of the switch manufacturer. For example, your central office could have a Nortel DMS100 switch but have the span configured as NI2; in this case, you should choose the default setting of National/NI2.

Function 2135: DID

Use the scroll keys to enable or disable. **Default:** Disabled. DID is enabled or disabled for the entire span. PRI signaling sends the called number in every call setup; therefore, both pilot numbers and DID numbers need to be programmed into the system. If DID is enabled call processing will look at the first ring to determine if it is a DID number or a pilot number coming in. DID calls will be routed to the appropriate location as programmed. Numbers that are programmed in the pilot table will be allowed to ring and follow the answer ring assignments.

Function 22: CO access/denial tables

Function 221: Centrex/PBX access code

If the system is to be used behind Centrex or another PBX, you must list the **dial access code** used to gain access to a CO line from Centrex or the PBX, so that toll restriction can ignore the access code digit(s). Users must dial the access code after accessing a line by **either** (a.) dialing **9, 8, 71, 72, 73, 74, 75, or 76** or (b.) pressing a line key (if programmed).

The access code can be one or two digits — *e. g.*, 9, 81, *etc.* — and must be programmed for each line group.

Default: None.

Note: You must set the flash duration (Function 151; see page D.2) for the requirements of the host switch.

Function 222: Toll restriction exception tables (system-wide)

The system's toll restriction is based on outbound calls being defined as either *toll calls* or *non-toll calls*:

- **Toll calls** (deny table) — All “1+” or “1010” calls, information, operator, international, “1-900” and “976” calls.
- **Non-toll-calls** (allow table) — All seven- and 10-digit local calls, and all “1-800” or “1-888” calls.

As part of extension feature authorization (Function 32; see page F.9), each station is programmed to be allowed or denied toll calls. All stations that have been assigned access to a line group can make non-toll calls.

You can program an *allow exception table* and a *deny exception table* to be exceptions to toll restriction. A number listed in the allow exception table (*e. g.*, a branch office or vendor's location) will be allowed to **all** stations, regardless of how they're set in Function 32. Conversely, a number listed in the deny exception table (*e. g.*, a “1-900” number) will be **denied** to **all** stations.

1. Enter the numbers for either table, separating each number by #.

Example: For “1-900,” enter **1 9 0 0 #**.

Note: Press **MUTE/DND** to insert a “wild card” digit.

Warning: Do **not** include the IP Series system's line access codes (9, 8 or 71–76) in **any** of the toll restriction entries.

2. After the last number, enter ## to end the list.

The IP Series system will apply the numbers you enter to their most significant digit.

Example: Entering 1 5 0 5 into the deny exception table tells the system to deny all “1+” calls to area code 505. **But** entering 1 5 0 5 4 4 5 8 7 8 7 into the table tells the system to deny “1+” calls **specifically** to (505) 445-8787 while **allowing other** “1+505” calls.

To allow information calls, enter into the allow table: 411, 1411, 5551212, 1XXX5551212 (where X is a wild card digit, entered by using MUTE/DND). **Default:** None.

Function 223: ARS

Within the IP Series system, route selection is normally accomplished by assigning lines to line groups (9, 8, or 71-76). The user then manually selects the line group for the type of call to be made. Typically, the same carrier handles both local and long distance calls so the user will only have to select an alternate group (8 or 71-76) for rare occasions.

Automatic Route Selection (ARS) can be enabled with or without a T1 Card. An application for non-T1 use may be OCC (Other Common Carrier) codes or what are commonly called “PIC codes” (or “dial-around codes”). With T1, users may want to have all long distance traffic go over their T1 and local calls go over copper. This would eliminate the need for the end user to know which line group (e.g., 9 for local and 8 for long distance).

With ARS enabled in this function, the system will not connect to a line immediately when the user dials 9 (or goes off-hook with outside dial tone preference enable). Instead, the system will “play” dial tone (false, or system) to the user, store the digits dialed, check the toll restriction tables and, if allowed, then follow the ARS table as programmed.

The ARS function defaults to off. When enabled, the system will follow the default programming in Tables 1 and 2: i.e., local, information and toll-free calls will be routed over Table 1 Line Group 9, and long distance calls will be routed over Table 2 Line Group 8.

ARS always begins its search with Table 3 to determine whether custom programming is in place or it should follow the default. Should further definition be required, Tables 3–10 are available for custom programming. Each table can support 100 entries of 10 characters, for a total of 800 custom entries. Tables 3–10 are also where you would enter the OCC codes. Any number not matching the custom programming will follow the default programming.

Example:

Table	Line group(s)	OCC	Definition
1	9		7 or 10 digits, information
2	8		1+, 0+, 01+, 011+, or 101XXXX
[3–10]	9, 8, 71–76	101XXXX	1+XXX, 1+YYY, etc.

Fixed

Programming ARS

1. Enable/disable ARS (default is *DISABLED*).
2. Select the ARS table to program (3–10).
3. Use the scroll key to select the line group.
4. Enter Other Common Carrier numbers.
5. Enter numbers for the table, separating each number by #.

Example: For “1-976,” enter **1 9 7 6 #**.

Note: Press **MUTE/DND** to insert a “wild card” digit. The **Hold** key will delete an entry.

Warning: Do **not** include the IP Series system’s line access codes (9, 8 or 7) in **this table**.

The IP Series system will apply the numbers you enter to their most significant digit.

Examples: Entering **1 5 0 5** into the table tells the system to place all “1+” calls to area code 505 to the line group and Other Common Carrier listed. Entering **1 5 0 5 4 4 5 8 7 8 7** into the table tells the system to place “1+” calls **specifically** to (505) 445-8787 to the line group and Other Common Carrier listed while *other* “1+505” calls will follow regular LD routing to line group 8.

After the last number, enter **# #** to end the list. Enter another list or press **#** to exit.

Note: Toll restriction, as set in Function 222, will be applied to calls before released.

Function 224: DID and DNIS translation table

A translation table is programmed to translate DID or DNIS routing numbers to the corresponding ID (**ID**), mailbox (**MB**) extension (**EXT**) or department with both day and night destinations. The IP Series system supports up to 4-digit DID and DNIS/ANI. Up to 300 numbers can be programmed into the table (multiple numbers programmed to the same destinations). An entry for exceptions is provided and can be programmed for an ID (**ID**), mailbox (**MB**) extension (**EXT**) or department.

Default: *Operator*.

```
DID/DNIS TABLE
DID/DNIS #: 3352>
```

```
DID/DNIS TABLE
EXCEPTION:      >
```

To program the translation table:

1. **Either** enter the DNIS or DID number **or** use the scroll keys to select a previously programmed number or exception.

Note: Pressing the right scroll key will start with a blank number field for input and continue through all previously programmed numbers, ending with the exception entry (continuing to scroll will start over the blank entry). Pressing the left scroll key will start with the exception entry, continue in reverse order with previously programmed numbers and end with the blank number entry (continuing to scroll will start over with the exception entry).

Note: Pressing **HOLD** will delete an entry.

2. Press the **#** key. The system will prompt you to enter a name for this DID line; the name will appear on the bottom line of the display of a station using the line.

3. Enter the desired name (see “Entering alphanumeric characters,” page C.2).
4. Press the # key. The system will prompt you for the day mode call routing.
5. Use the scroll keys to select whether you’re routing to a branch (ID), mailbox (MB) or extension (EXT); then enter the number. Here are two examples, based on the example table below:

```
DID/DNIS #: 3352
DAY ID: 12 >
```

```
EXCEPTION:
DAY EXT: 100 >
```

6. Press the # key. The system will prompt you for the night mode call routing.
7. Use the scroll keys to select whether you’re routing to a branch (ID), mailbox (MB) or extension (EXT); then enter the number. Here are two examples, based on the example table below:

```
DID/DNIS #: 3352
NIGHT MB: 300 >
```

```
EXCEPTION:
NIGHT EXT: 100 >
```

8. Press the # key to finish.

Example:

DID or DNIS	Name	Day translation	Night translation
3578		X105	X105
3624		X290	MB310
3352		ID12	MB300
Exceptions		Operator (X100)	Operator (X100)

Function 225: Pilot number table

Every call on a PRI span is sent with the called number in the setup message. This means you can determine whether to use a number as a pilot number or as a DID number. Pilot numbers are a means of routing a company’s primary published phone number differently from a DID. The system supports up to five pilot numbers, each with its own answer ring assignment. This is important, because the dynamic channel allocation prevents you from routing based on channel. Pilot numbers can be routed to an ID branch, department, extension or mailbox. This varies from DIDs in that, when a DID number is routed to an extension, it is considered answered and follows the busy/no-answer routing of the extension; but, with pilot numbers, the call will be routed to the extensions for live answer for the designated number of rings, then can be routed to an ID branch in the event of busy/no-answer.

Note: This feature is accessible only if Function 2135 is enabled.

9. Enter the pilot number. It can be up to 10 digits long.
10. Enter the name for the pilot number. Each name can have up to 10 alphanumeric characters.
11. Enter the maximum calls allowed on this pilot number.

Range: 1–23.

Default: 23.

12. Set answer ring assignments. (For programming information, see step 6 in Function 2131, on page E.8.)
13. Repeat steps 1–4 for the remaining pilot numbers.

Example:

Pilot #	Name	Max calls	Ring 1	Ring 3	Ring 5	Ring 9
214 555-1686	ABC Co.	13	ID1			
214 555-1600	DEF Co.	10	X100	X100, X101	ID2	

Function 23: CO line parameters**Function 231: Analog line receive volume**

Many variables can affect the volume of the CO lines. Weak lines can reduce the IP Series system's ability to properly detect DTMF dialed by an outside caller. Conversely, "hot" lines can cause DTMF distortion and/or increase the opportunity for message talk-off (*i. e.*, messages being cut off before completion). Ideally, a message recorded from an outside call has the same playback volume as the system prompts. This function can be used to adjust the gain of the receive volume of the CO lines.

Range: 0–12 (lowest to highest gain, respectively).

Default: 10.

Function 232: Analog line disconnect

You can set the lines to detect the open loop interval (if available from the CO) and disconnect more quickly. This will also allow the system to:

- Drop abandoned calls from park and hold
- Reduce the opportunity for abandoned calls to be transferred by the auto attendant
- Reduce the possibility that abandoned calls could create messages that are either silent or contain CO-generated tones.

Since open loop intervals generated by the CO may vary in duration, use this function to program the IP Series system to less than or equal to the CO open loop interval.

If this programmed value is set unnecessarily low, the IP Series system may falsely interpret static or a momentary loop break as an open loop and disconnect a caller on hold or in the process of leaving a message. If this value is set too high, the IP Series system may not detect a valid open loop signal for fastest call processing.

Range: 1–255 (10–2,550 ms) (or 0 to turn off open loop detect).

Default: 6 (60ms).

Function 233: T1 line receive volume

Many variables can affect the volume of T1 lines. Different volume levels may be required when connecting a DLC configured for T1, depending on the signal level of the T1. The volume level can be adjusted by increasing or decreasing the setting in this function. By default, the setting is –6 dB; changes to the setting are in 2-dB increments.

Example: If calls received at the extension have low volume levels, the pad level for that T1 circuit can be adjusted to increase the volume. Select the circuit to adjust by pressing the appropriate DSS key and press # to confirm. Use the scroll keys to select the appropriate dB level and press # to confirm.

Programming a circuit

To program a circuit, select the appropriate DSS key and press the # key to confirm. You can select from the first set of 16 COs, and then press the scroll keys to select from the remaining eight CO lines on the first DLC (T1). Scrolling again will allow you to select the 16 COs on a second DLC (T1) if one is installed, and scrolling again will allow you to select from the 8 remaining COs. If there is only one DLC (T1) installed, then scrolling will return you to the first 16 COs.

```
PC3 T1 13-36
CO22 CIRCUIT 10>
```

After selecting the COs to program, use the scroll keys to select the new level of gain or loss in dB. Press # to confirm. Select additional circuits to adjust and program as above.

```
RECEIVE VOLUME
LINE COMP -28DB>
```

Range: -28 dB to 6 dB (lowest to highest gain, respectively).

Default: -6 dB.

Function 234: PRI receive volume

Many variables can affect the volume of PRI lines. Different volume levels may be required when connecting a DLC configured for PRI depending on the signal level of the PRI line. The volume level can be adjusted by increasing or decreasing the setting in this function. By default, the setting is -6 dB; changes to the setting are in 2-dB increments.

Example: If calls received at the extension have low volume levels, the pad level for that PRI circuit can be adjusted to increase the volume. Select the circuit to adjust by pressing the appropriate DSS key and press # to confirm. Use the scroll keys to select the appropriate dB level and press # to confirm.

Programming a circuit

To program a circuit, select the appropriate DSS key and press the # key to confirm. You can select from the first set of 16 COs, and then press the scroll keys to select the from the remaining seven CO lines on the first DLC (PRI). Scrolling again will allow you to select the 16 COs on a second DLC (PRI) if one is installed, and scrolling again will allow you to select from the seven remaining COs. If there is only one DLC (PRI) installed, then scrolling will return you to the first 16 COs.

```
PC3 T1 13-36
CO22 CIRCUIT 10>
```

After selecting the COs to program, use the scroll keys to select the new level of gain or loss in dB. Press # to confirm. Select additional circuits to adjust and program as above.

```
RECEIVE VOLUME
LINE COMP -28DB>
```

Range: -28 dB to 6 dB (lowest to highest gain, respectively).

Default: -6 dB.

Function 24: Caller ID

This function activates the Caller ID capability in the IP Series system — **provided that** the customer has ordered Caller ID service from the Telco. The system will display the caller's name (or other designation such as "OUT-OF-AREA," etc.) for incoming calls or messages (or show the Caller ID number if the CO only provides a number).

Default: Disabled.

Esi-Dex and auto callback — This is accomplished by pressing **REDIAL** or the **ESI-DEX** key either during message playback or after an Esi-Dex search. Caller ID numbers received from the CO are 10 digits long (and include the area codes for local calls). **In auto callback, the IP Series system assumes all calls are to be long distance and will automatically add a "1" prefix to the 10 digits to be dialed.**

A table of local area codes can be programmed to indicate that calls to those area codes are to be dialed as local calls. Select one of the following two types of **local** dialing for each area code entered:

- **Local 7** — Local calls that can be dialed only as seven-digit numbers (the system strips the area code before dialing and will **not** add a "1" prefix).
- **Local 10** — Local calls that can be dialed only as 10-digit numbers (the system will **not** add a "1" prefix).

If you have an area code that can be called as a long distance number (with a "1" prefix) **and** as a local number (10 digits without a prefix), you must decide which case is the more prevalent and then add to or exclude from the area codes exception list accordingly. Therefore, some of these calls will have to be made manually.

Note: Since the Caller ID information is transmitted from the CO during the silence between the first and second ring, enabling this feature will delay the answer of inbound calls until the second ring.

Function 3: Extension programming

This section provides programming for extensions and department groups.

Important: Where any **gray shading** (■) appears in an example, it represents values either **unavailable** to the function or **unused** in the particular example.

Function 31: Extension definition and routing

Extensions can be either of the following:

- **IP Feature Phone extensions** (*IP PHONE* in the chart below and succeeding charts) — These are numbered with extensions between 100 and 195, inclusive, and may be either local phones or remote phones.
- **Analog ports** (*ANALOG* in the same charts) — These are numbered with extensions between 200 and 229, inclusive, and are dependent on the port card to which they are attached — *i.e.*, the first 303 port card will host extensions 200, 201 and 202, while the second 303 hosts extensions 203, 204 and 205 — and so on.

Below is an example of the portion of a completed programming worksheet (Appendix II).

Ext	Type	Name	Line groups	CF day	CF night	Pg zone	Ext
0		Operator		X100	X100		X100
100	Local IP	Jane	9	MB100	X105	0,1,2	
101	Remote IP	Roger	9	MB101	MB101		
102	Remote IP	Sally	9,8	MB102	MB102		
109	Local IP	Dean	9,8	MB109	MB109	0, 2	
200	Analog	Roger 2	9	MB110	MB106		
201	Fax	Fax					

Note: Extension 100 defaults as *OPR* (when a user dials 0) and is an example of system default.

Local IP Feature Phones

Below is an example of the portion of a completed programming worksheet (Appendix II) for local IP Feature Phones.

1.	2.	3.	4.	5.	6.	7.	8.
Ext	Type	Name	CO	CF day	CF night	Pg zone	Ext
0		Operator		X100	X100		X100
100	Local IP	Jane	9	MB100	X105	0, 1, 2	
105	Local IP	Carl	9	MB105	MB105	0, 2	
113	Local IP	Maria	9,8	MB113	MB100	0, 1	
109	Local IP	Dean	9,8	MB109	MB109	0, 2	

Note: Extension 100 defaults as *OPR* (when a user dials 0) and is an example of system default.

1. Extension number

Extension numbers for IP phones, whether remote or local, range from 100 to 195. IP extensions may be assigned at random within that range.

```
STATION PROG
EXT: _
```

2. Type

Based on the port card installed and the extension number entered, the IP Series makes default selections — IP station or analog device. If it is an IP station, use the scroll keys to choose whether it is to be a remote station or a local station.

```
X123 TYPE
LOCAL
```

3. Extension name

This is used for the LCD display, reports, and as a programming aid. The name's length can be no longer than 10 characters (See "Entering alphanumeric characters," page C.2).

Default: The extension number.

4. CO line group

Assigns the extension's ability to access one or more CO line groups (9, 8, and 71–76).

Default: 9.

5. and 6. Call forward busy/no answer

The extension can be set to call forward busy/no answer to another extension (or department), a mailbox, or a branch ID for day mode, and differently for night mode.

Default: The extension's mailbox.

7. Extension page zone assignment

List the page zones (1, 2, 3...) that are to include this extension. All stations are in All Page and cannot be edited.

Default: 0 (All page). **Range:** 1–9.

The overhead paging port (extension 199) can be paged along with other extensions in a zone by including the desired page zone(s) for extension 199.

All digital phone extensions are included in the all-page zone. *Analog extensions cannot be included in page zones.*

8. Operator translation

Extension 0 (Operator) programming requires:

- Programming call forwarding for day and night mode
- Entering the extension number, department, mailbox or ID branch to which calls are to be directed when someone dials 0.

Default: 100.

Remote IP Feature Phones

Below is an example of the portion of a completed programming worksheet (Appendix II) for Remote IP Feature Phones.

Important: *Never* reprogram a Remote IP Feature Phone from the Remote Phone itself.

1.	2.	3.	4.	5.	6.	7.
Ext.	Type	IP address	MAC	Gateway IP	UDP port	Remote-access IP address
0						
101	Remote IP	192.168.1.3	00304D135661	192.168.1.1	59101	221.46.197.104
102	Remote IP	192.168.210.5	00304D135F2F	192.168.210.1	59102	221.46.197.104

(Table continued)

1.	8.	9.	10.	11.	12.	13.
Ext.	Name	CO	CF day	CF night	Paging zone	Operator translation
0	Operator		X100	X100		X100
101	Roger	9	MB101	MB101		
102	Sally	9,8	MB102	MB100		

1. Extension number

Extension numbers for IP phones, whether remote or local, range from 100 to 195. IP extensions may be assigned at random within that range.

2. Type

Based on the port card installed and the extension number entered, the IP Series makes default selections — IP station or analog device. If it is an IP station, use the scroll keys to choose whether it is to be a remote station or a local station.

3. IP address

Enter the IP address that the remote phone will be using at its remote site. (Note: this information will have to be obtained in advance of programming the remote phone.) Enter this address in dotted-quad notation (for example, 192.168.1.3) using the # key as the period between octets. The phone must be on the same subnet as the LAN interface of the gateway device (cable modem, router, etc). For instance, if the LAN interface's IP address is 192.168.210.1, and its subnet mask is 255.255.255.128, the first three octets of the phone's address must be 192.168.210, and its last octet between 2 and 127.

4. MAC address

Enter the MAC address of the remote phone. The MAC address of the phone appears on the second line of the display when the phone is powered up.

Important: **DON'T** connect a new **Remote IP Feature Phone** to the IP PBX network before completing extension programming.

The MAC address is a 12-character alphanumeric address, of which the first six digits will always match (00 30 4D). Enter the complete 12-character alphanumeric address. Use the following keys to enter alphabetic characters:

Press...	To produce...
PROG/HELP	A
REDIAL	B
CONF	C

Press...	To produce...
RELEASE	D
FLASH	E
TRANSFER	F

5. Gateway address

Enter the address of the remote phone's default gateway – that is, the LAN interface of the gateway device at the remote site. The phone must be on the same subnet as the LAN interface of the remote gateway.

6. UDP port

Enter the first two digits of the remote phone's UDP port. This number is the base prefix UDP port. The default UDP base is 59. The last three digits will be the station's extension number (between 100 and 195), and will be populated by default. Extension 101, for example would have a UDP port of 59101 by default.

The UDP port for the remote phone does not have to be the same as for the IP PBX (as programmed in Function 81). The UDP port for the remote phone must be one that the remote gateway can program as "open" and must not be already assigned to another device at the remote site. The remote gateway will then have to be programmed to recognize that traffic destined for that UDP port should be allowed to pass through its security system.

If the remote gateway cannot open UDP port 59xxx (where xxx is the phone's extension), or if that port is already open but designated for another device, the installer can choose any other base UDP number between 10 and 65, inclusive. After entering the first two digits, the phone's extension will populate the last three digits.

7. Remote-access IP address

Enter the remote-access IP address for the IP PBX. The display will default to the IP address entered in Function 82 (see page K.1). If a Remote IP Feature Phone will use this address to connect to the IP PBX, press # to confirm; if a Remote IP Feature Phone will use an alternate IP address to connect to the IP PBX, enter that address and press # to confirm. "SAVE PARAMETERS?" will appear on the display. If you have correctly entered the IP addressing parameters (items 1–7), press # to program the parameters for any Remote IP Feature Phone; to abort programming, press * to restore the system parameters to their previously set values.

8. Extension name

This is used for the LCD display, reports, and as a programming aid. The name's length can be no longer than 10 characters (See "Entering alphanumeric characters," page C.2).

Default: The extension number.

9. CO line group

Assigns the extension's ability to access one **or more** CO line groups (9, 8, and 71–76).

Default: 9.

10. and 11. Call forward busy/no answer

The extension can be set to call forward busy/no answer to another extension (or department), a mailbox or a branch ID for day mode and differently for night mode.

Default: The extension's mailbox.

12. Extension page zone assignment

Remote IP phones cannot participate in any page zones.

13. Operator translation

Extension 0 (Operator) programming requires:

- Programming call forwarding for day and night mode
- Entering the extension number, department, mailbox or branch ID to which calls are to be directed when someone dials 0.

Default: 100.

Important: After completing the extension programming for a new Remote IP Feature Phone, connect that phone to the IP PBX network. Repeat Function 31 extension programming for this extension, pressing # at the appropriate times to confirm previously entered values. (Performing this step again causes the IP PBX to send the programming information to the Remote IP Feature Phone.)

Analog ports

The following is an example of a completed worksheet (Appendix II) for analog devices:

1. Ext.	2. Type	3. Name	4. Line groups	5. CF day	6. CF night	Paging zone	Operator translation
200	EXT	Roger 2	9	MB106	MB106		
201	FAX	Fax	9	ID9999	ID9999		

Here are the steps for programming analog ports:

1. Extension number

Analog port extension numbers are assigned numbers beginning with 200. An IP 200 equipped with ten 303 cards potentially could have analog extensions numbered to 229. Analog extensions are tied to the location on the port card (*e.g.*, the first device on the first 303 card will be extension 200).

Card location	Extensions
303 (first card)	200
	201
	202
303	203
	204
	205
303	206
	207
	208
303	209
	210
	211
303	212
	213
	214
303	215
	216
	217
303	218
	219
	220
303	221
	222
	223
303	224
	225
	226
303 (last card)	227
	228
	229

Example:	IP 200 slot:									
	10	9	8	7	6	5	4	3	2	1
								303	303	303

303 Card in first slot would be assigned extensions 200 through 202.
 303 Card in second slot would be assigned extensions 203 through 205.
 303 Card in third slot would be assigned extensions 206 through 208.

2. Type

If Analog Port is selected, then the ports can further be defined as follows; the words in parentheses (**EXAMPLE**) indicate what the display will show in each case:

- **Phone (EXT)** — Designed to provide for standard 2500-type phones. See the *IP Series User's Guide* for a complete description of the capabilities.
- **Common ringer (RINGER)** — Connected via a tip and ring pair; will apply ring voltage whenever a line rings in night mode.
- **Fax (FAX)** — If the Auto Attendant detects a fax tone, it will automatically forward the tone to the analog port programmed as FAX.
- **Modem (MODEM)** — Incoming calls for a modem can be manually transferred to the modem extension; also, the modem can automatically generate outbound calls. Maximum connect speed through the PBX is 9600 bps.
- **Door phone (DOOR)** — A telephone connected to this port will automatically dial the programmed ring down extension number whenever the set is taken off-hook.

3. Extension name

This is used for the LCD display, reports, and as a programming aid. The name length can be no longer than 10 characters (See “Entering alphanumeric characters,” page C.2).

Default: The type selected.

Note: The Ringer and Door types' names cannot be changed here (but can in Function 32; see page F.9).

4. CO line/ring down

For fax, modem, or phone, select the desired line group — 9, 8, or 71–76.

Default: 9.

If *door phone* is selected, an extension number is entered as a ring down destination.

Default: Extension 100.

No dial tone is presented for *common ringer*.

5. & 6. Call forward busy/no answer

The ports can be set to call forward busy/no answer to an extension, department, mailbox or a branch ID for day mode and differently for night mode.

Default: ID9999 (automatic disconnect).

The default settings for each analog port type are shown below:

1.	2.	3.	4.	5.	6.
Ext.	Type	Name	CO	CF day	CF night
200	PHONE	Phone	9	MB106	MB106
	RINGER	Ringer			
	FAX	Fax	9	ID9999	ID9999
	DOOR	Door	X100	ID9999	ID9999
	MODEM	Modem	9	ID9999	ID9999

Paired IP Feature Phone/analog phone operation

For someone wishing to have an IP Feature Phone in his office and a cordless phone for roaming the building:

1. Create a call forward key on the IP Feature Phone to forward to the cordless phone.
2. Program the call forward busy/no answer for the cordless station to the IP Feature Phone's mailbox. The user will then have all of his messages in one location (however, he/she can retrieve them from either phone).

Overhead paging interface

You can connect a dry-contact overhead paging device to the system through the OH Paging interface on the front of the IP PBX. The overhead paging port's access is fixed as extension 199 for programming purposes. The user can access it by:

(a.) Dialing **1 9 9**

or

(b.) Programming **199** as a programmable key and /or including **199** in one or more page zones.

Note: DTMF can be transmitted to the overhead paging port after access, allowing for zone overhead paging, if the paging unit supports zone paging.

1.				2.		
Ext.	Type	Name	CO	CF day	Cf night	Pg zn
0		Operator		X100	X100	
100	FP	Jane	9	MB100	X105	1,2
199						

Each programming step for overhead paging is defined as follows:

1. **Extension number** — Enter **1 9 9** during extension programming.
2. **Extension page zone assignment** — List the page zones (*1, 2, 3*) that are to include, also, the overhead paging port. (All page)

Example: Here is a portion of a completed Programming Worksheet (Appendix II) for extensions. The paging port, extension 199, has been added to page zone 1. The user then can access only the overhead pager by dialing **1 9 9** or can page through both the overhead pager and all phones listed in page zone 1 by pressing **PAGE (#)** and **1** on his/her phone.

1.				2.	
Ext.	Type	Name	CO	Pg zn	
100	IP PHONE	JANE	9	1,2	
199				1	

Dry contact control

The manner in which the dry contact pair is pinned out at the RJ-45 connector sets the pair as either **normally open** (sending a page to the port will close the contacts) or **normally closed** (sending a page to the port will open the contacts). See the "Hardware installation" section (page B.7).

Function 32: Extension feature authorization

The Installer or Administrator can allow or deny many extension features on an extension-by-extension basis. A User, however, can only program and use allowed features (by using a combination of voice and LCD prompts) from his/her phone.

Below is an example of a completed Programming Worksheet.

1. Ext.	2. Name	3. Call wait	4. DND	5. AA block	6. Rec.	7. Svc. obs.	8. Toll allow	9. Sys. spd. dial	10. Auto page	11. Ext. fwdg.	12. Fwdg. to toll nos.	13. Trunk- to-trunk xfer
XXX	Default	Y	Y	N	Y	N	Y	Y	N	N	N	N
100	Jane	Y	Y	N	Y	N	Y	Y	Y	N	N	N
101	Roger	Y	Y	N	Y	N	Y	Y	N	N	N	N
102	Sally	Y	Y	N	N	N	Y	Y	Y	N	N	N
200*	Bill	Y		N			Y	Y	N	N	N	N

Here is the sequence of programming. The programming steps are:

1. **Extension number** — Enter the extension number to program.
2. **Extension name** — Name the extension (if not previously named in Function 31 [see page F.1]).

For each of the following features, press a scroll key (▼ or ▲) to select *YES* or *NO*.

3. **Call waiting** — Allows the user to turn call waiting on or off for his station.
4. **Do not disturb** — Allows the user to activate DND from his station.
5. **Auto attendant block** — Blocks calls from being transferred to the station from the auto attendant; follows the extension's call forward day/night as programmed in function 31 (see page F.1).
6. **Live recording feature** — If enabled, will allow the user to record conversations.
7. **Service observing** — Allows the user to monitor the conversations of those stations listed in the **service observing list** for his/her station. If this is enabled, you must enter a list of allowed extensions.

Note: A Department number can be entered as an extension in the Service Observing list and will then automatically include all members of the Department even if the members of the Department are later changed.

* An example of an analog phone.

8. **Toll restriction** — “YES” allows the user to place toll calls. If “NO,” the user can make only either non-toll calls or calls to numbers listed in the allow exception table.
9. **System speed dial** — “YES” allows the user to access and place system speed dial calls.
10. **Auto-page** — Lets the user turn auto-page (*defined below*) on or off at his/her station.

Note: This feature is used in conjunction with the directory names recorded in Function 62 and is not active until a directory name is recorded for the extension.

If the station user has his/her mailbox set to answer with personal greeting 3 and a caller presses **3** to page that user, this feature automatically pages the station user in the page zones entered in Function 31. If no page zone is entered, all Feature Phones on the system are paged.

Default: Disabled.
11. **External forwarding** — Allows the station user to enable the off-premises-“reach-me” feature (the user can give, to callers who are forwarded to his/her voice mailbox, the option of trying to reach him/her at another number). This requires a trunk-to-trunk transfer and will use two CO lines for the length of the conversation. The user must set his/her mailbox to answer with personal greeting 2 and inform the caller to press **4** for this option. After the system dials the last digit of the external forwarding number, it will begin to play a prompt saying, “*You are receiving a forwarded call. Press any key to accept.*” This prompt will play continuously for 30 seconds. When DTMF is detected at the remote end, both trunks are connected. If no DTMF is detected, the caller is forwarded to the user’s voice mail.

Default: Disabled.*
12. **Forwarding to toll numbers** — This feature is used in conjunction with external forwarding (see previous item). When enabled, this feature lets the user program a long-distance number for external forwarding.

Default: Disabled.

* While the two trunks are connected, the system constantly monitors the lines for open loops. If it detects an open loop on either line, it terminates both CO connections. Additionally, the system periodically will monitor for voice on the connected COs. If it detects no voice traffic, it terminates both CO connections. Finally, if both COs are connected for a programmable period (default is 60 minutes), the system will terminate the connection, regardless of the presence or absence of activity.

- 13. Trunk-to-trunk transfer** — When enabled, this lets the station user initiate a **trunk-to-trunk transfer**. The user, while connected to a CO line, can press **TRANSFER**, followed by his/her line access code(s), dial an off-site number and then complete the trunk-to-trunk transfer by simply hanging up. Both parties are then connected.

Default: Disabled.

Important: USE OF FEATURES, SUCH AS TRUNK-TO-TRUNK TRANSFER, THAT REQUIRE TRUNK-TO-TRUNK CONNECTIONS WILL INCREASE THE RISK OF TOLL FRAUD. IN NO EVENT SHALL ESI (ESTECH SYSTEMS, INC.) BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER INCLUDING, BUT NOT LIMITED TO, FRAUDULENT TOLL CHARGES, LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTIONS OR ANY OTHER COSTS OR DAMAGES RELATED THERETO ARISING FROM THE USE OF THESE FEATURES.

Example: Here is a portion of a completed Programming Worksheet (Appendix II) for extension feature authorization. Note that:

- Extension 100 cannot record calls but **can** make toll calls (except those listed in the deny table) and can access the system speed dial numbers.
- In comparison, Extension 102 cannot make general toll calls but also can call any system speed dial number, **even if it's a toll call**.
- (Extension 110 doesn't have DND, AA block, record or service observing capability because it's an analog port.)

1. Ext.	2. Name	3. Call wait	4. DND	5. AA block	6. Rec.	7. Svc. obs.	8. Toll allow	9. Sys. spd. dial	10. Auto page	11. Ext. fwdg.	12. Fwdg. to toll nos.	13. Trunk- to-trunk xfer
100	Jane	Y	Y	N	N	N	Y	Y	N	N	N	N
102	Sally	Y	Y	N	Y	N	N	Y	Y	N	N	N
200*	Bill	Y		N			Y	Y	N	N	N	N

Function 33: Department programming

You can create up to 10 **departments** (or “hunt groups”), each with a maximum of 32 extensions. You also can assign an extension to more than one department. Department numbers range 200–299.

Department hunting methods

You can designate a department to be rung in one of the following methods:

- **In Order** — Calls will ring each phone in the order listed. If all are busy or none answer, the call will call forward as programmed here.
- **All** — Calls will ring all listed phones at the same time. If no extension answers or all are busy, the call will call forward as programmed as part of this function.
- **UCD** — Calls will be rotated evenly throughout the listed extensions. If none answer or all are busy, the call will call forward as programmed here.

* An example of an analog phone.

- **ACD** — Calls will be presented to the longest idle logged-on agent. If all agents are busy, the caller will hear the **ACD queue prompt** (Prompt 538; see page I.2) and placed in queue. When an agent becomes available, the longest holding caller will be connected. If no agents answer before the exit time (Function 154; see page D.2) is reached, the call will call forward as programmed in this function.

A caller holding in an ACD department queue will be connected to music/message-on-hold, during which time he/she can dial options presented, such as **0** for the operator. While on hold, the caller is periodically played prompts to continue to hold for an available agent.

The ACD queue prompt is played when all extensions are busy and the first time the caller has been put on hold (“*All extensions are busy, please hold and your call will be answered in the order received*”); and **ACD hold prompt** (Prompt 539; see page I.2) is played at a 60-second interval (“*All extensions are still busy, please continue to hold*”). These prompts can be re-recorded in Function 61 (“Re-record system prompts”; see page I.1).

All ACD agents must have Digital Feature Phones. Agent log-on keys will be automatically assigned to the lower left programmable feature keys for the stations listed in ACD departments. Stations can later be added to or deleted from ACD Departments by creating or deleting log-on keys as part of their station programming (See the *IP Series User’s Guide* [#0450-0189]).

Note: CO line keys never should be programmed to ACD agent phones.

- **Pick-up only** — Additionally, you can designate a department as a **pick-up group**. Calls cannot be directed to a pick-up-only department. Instead, one must use a programmable feature key on phones that are to use this feature.

Note: Usually a caller will be forwarded to a department by the auto attendant. However, a user can also transfer a caller to the department number. The transferred call will be processed according to the above description as if transferred by the auto attendant.

Procedure

Here’s an example of a completed programming worksheet:

1. Ext.	2. Name	3. Type	4. CF day	5. CF night	6. List:
290	Sales	In order	MB300	MB300	104, 112, 115
291	Service	ACD	X0	MB301	101, 102

Here are the programming steps.

1. **Department number** — Range is 290–299.
2. **Name** — Used for the LCD display, reports, and as a programming aid. Length can be up to 10 characters (See “Entering alphanumeric characters,” page C.2).
Default: The department number.
3. **Type** — Selected from one of the five possible types (*all, in order, UCD, ACD* or *pick-up*).
Can be changed later without affecting its other programmed values.
Default: In order.
4. and 5. **Call forward busy/no answer** — The department can be set to call forward busy/no answer (for all extensions in the department) to an extension, another department, a mailbox or a branch ID for day mode and differently for night mode. The department can have its own mailbox for pickup by members knowing the password or forwarded to any mailbox type including guest, cascade, etc. Calls routed to an extension via a department will follow the **department’s** call forwarding, while calls transferred to the extension will follow the **extension’s** call forwarding as programmed in Function 31 (see page F.1).
Default: X100.

6. **List of extensions in the department** — Enter the extension numbers that are assigned to this department. To delete an extension number from a list, press **HOLD**. Please note that **the order that the extension numbers are entered will dictate the order called when the department selected is “in order.”**

Note: Analog ports cannot be members of an ACD department.

Example: Here is a portion of a completed Programming Worksheet (Appendix II) for Department programming. Department 290 was created to have calls directed to it to first ring 104, then, if busy/no answer, 111, and then 112. If all are busy or do not answer, the call will forward to the operator if day mode or if during Night Mode to guest mailbox 300 (for pick up in the morning). Department 291 rotates the calls between the two extensions listed. If both busy/no answer, the call to go the service manager (X105), or in Night Mode to guest mailbox 401 (which has been set to page the tech on-call).

1. Ext.	2. Name	3. Type	4. CF day	5. CF night	6. List:
290	SALES	IN ORDER	X0	MB300	104, 111, 112
291	SERVICE	UCD	X105	MB301	101, 102

Function 35: Extension button mapping

The programmable feature keys' initial default is not programmed (except X100, with a day/night key, at the upper-left key). Use this function to change the programmable feature keys **system-wide**. Users can later change the programmable feature key positions for **their** stations as part of station programming.

Important: Future, system-wide changes made later here by the Installer will overwrite **any** station user programming.

Procedure

1. When prompted, press the desired programmable feature key location.
2. Enter the appropriate digits on the dialpad.
3. Confirm the entry by again pressing the same programmable feature key.

To determine how a programmable feature key is currently programmed, press the key, note how it is programmed, and press the key again.

The keys can be programmed as follows:

CO line key

If the dialed digits are 1–66, the key will serve as a CO Line key.*

Note: Removing the line key appearances will set the station(s) to operate as a PBX with line access by dialing **9** (or **8** or **71–76**).

* ACD agent phones must not have CO line keys programmed.

Station or mailbox key

If the digits entered are a three-digit extension number (or department, guest mailbox, etc.), the key will become a station key providing the appropriate lamp information for phones and a direct transfer key for phones and mailboxes. (See “System fixed numbering plan,” page C.3.) Department pilots’ numbers (290–299) programmed here will appear on all phones; however, agent log-on keys (5290–5299) will appear only at the phones of assigned agents in the corresponding ACD department.

Speed dial key

If one enters **9** (or **8** or **71–76**) plus a phone number, the key will become a speed dial key for outside calls.

Feature keys

Feature keys (see below) cannot be programmed system-wide but must be programmed for each individual station. See the *User’s Guide* for a detailed description of each key and how to program it.

Code	Feature key
199	Overhead paging key
560	Manual day/night mode key
561	Service observing key
5XXX	ACD agent log on/off key
562	ACD agent wrap key
563XXX	ACD Administrator key
564	Headset key
565	Call forward key
565YYY	Forward to a destination
568	Message monitor key
569	Background announce key
571	Personal greeting 1
572	Personal greeting 2
573	Personal greeting 3
574	Missed call key
575 and 576	Virtual answer keys
577	QuickPage

(XXX = The ACD department number.; YYY = A forwarded-to extension.)

Note: To delete a programmable feature key, press **HOLD** instead of programming a value.

Virtual Mailbox Key

If the entered digits are a three-digit extension number for a guest, department mailbox, cascade mailbox, etc., the key will provide for direct transfer to that mailbox, as described above. However if you program **VOICEMAIL** and a three-digit extension or mailbox number, it will become a **Virtual Mailbox Key**, which will indicate message status for the mailbox (the LED will blink red if new messages exist) and provide direct pick-up of the messages.

To create a virtual mailbox key for a user extension: from the user’s Feature Phone, press **PROG/HELP 2**, then the feature key to be assigned and then **VOICEMAIL**; then enter the extension or mailbox number, and then finally press the feature key again to store the settings.

Private Line key

If a private line has been established in CO line programming (see page E.3), that CO line key must appear on that station's phone to allow outbound access to the line.

Function 4: Auto attendant programming

You can program the auto attendant, in CO line programming (Function 2; see page E.1), to answer calls immediately, on a delayed-answer basis or not at all (*i.e.*, for live answer at all times). If required, you also can program different main greetings and routing schemes for different combinations of lines. Day/night mode will change the main greeting announcement and affect rerouting of calls during call processing.

Function 41: Auto attendant branch programming

The IP Series system's auto attendant follows a **branch concept**: the caller is routed through a series of branches, ultimately to the extension he wishes to reach. The caller moves from branch to branch by selecting a number or name presented in a branch prompt. You may program a maximum of 100 branches.

There are three types of branches — *menu*, *GoTo* and *directory*. Use them to create virtually limitless routing possibilities.

Menu branch

A **menu branch** should include a recorded prompt that instructs the caller to make a selection from the choices presented such as “*For sales press 1, for service press 2, or for admin press 3.*” Whenever you create a menu branch, you must also create a corresponding number of sub-branches to match the number of choices given the caller in the prompt. Prompt recording occurs in Function 61 (see page I.1).

When a caller makes a single-digit selection in the menu branch, he/she will then advance to one of its sub-branches — which could be another menu branch (if there are more choices to make), or a GoTo branch (routes the caller to a destination; see below) or Directory Branch (for choosing from a list of names; see page G.3).

Notes: A menu branch must have a greeting recorded to activate it (except for ID1, the main greeting, which has a default greeting).

Only branches ID1 through ID8 have a day, day2, night and night2 greeting.

If a caller makes no selection during the prompt in a menu branch, he will be transferred according to the no-response programming for that branch (see page G.5).

GoTo branch types

A **GoTo branch** transfers the caller to an extension, department, mailbox, branch ID, or an outside number. Here are the types.

GoTo: Dial

The GoTo Dial Branch automatically blind-transfers the caller to the extension or department number programmed as its destination. If the number listed is a department, the system will follow the programming for the Department as set in Function 33 (see page F.12).

If the destination extension or department dialed is busy or does not answer, the call will follow call forwarding for the extension as programmed in Function 31 (see page F.1) or the department as programmed in Function 33 (see page F.12).

GoTo: Mailbox

Routes a caller to that mailbox's personal greeting. The mailbox can be a user, a guest/information mailbox, a group mailbox, cascade paging mailbox, or Q & A mailbox.

GoTo: Branch

Can also be used to jump to any other branch in the auto attendant. It is a good idea to provide a jump as a sub-branch of each menu branch, giving the caller the option either to repeat the menu or exit should he not wish to select any of the choices.

Example: “For Widget Sales, press 1. For Gadget Sales, press 2. Or, to return to the main menu, press 3.” In this case, the third sub-branch would be a GoTo Branch with ID1 (the main greeting) as its programmed destination.

GoTo: Outdial:

When you select a GoTo Outdial branch to program, the system will prompt you to select the outdial method — either trunk-to-trunk or Centrex.

GoTo: OutDial: with trunk-to-trunk

1. The system will access another CO line to call the outdial number.
Note: Two CO lines will be utilized, one for the inbound call and one to call the outdial number.
2. After the outdial number (including the access code and any special characters¹) is entered, the system will prompt you to indicate whether DTMF detection at the remote end is required before completing the connection.
If DTMF detection **is not** required, the system will complete the trunk-to-trunk connection after dialing the final digit of the outdial number (blind transfer); ignore steps 3–4.
However, if DTMF detection **is** required, continue with these steps.
3. The system will begin to play the following prompt after the final digit of the outdial number: “You are receiving a forwarded call. Press any key to accept.” This prompt will play continuously for 30 seconds.
4. What happens now depends upon whether the system detects DTMF from the called party:
 - If it does, the system completes the trunk-to-trunk connection.
 - If it doesn’t, the system forwards the call to the programmed call forwarding for this outdial branch (the next step for which you’re prompted if DTMF detection is required).
Note: You’ll be prompted to enter a call forwarding destination for an outdial branch **only** if (a.) the branch uses trunk-to-trunk **and** (b.) DTMF detection is required.
Enter an extension, branch ID or mailbox number for the day/night call forwarding of this GoTo Outdial branch.

Note: While both COs are connected, the system constantly monitors the lines for open loops. If it detects an open loop on either line, it terminates both CO connections. Additionally, the system periodically will monitor for voice on the connected COs. If it detects no voice traffic, it terminates both CO connections. Finally, if both COs are connected for 60 minutes, the system will terminate the connection, regardless of the presence or absence of activity.

¹ Special characters — such as *P* for *pause* or *F* for *flash* — can also be entered in the dial string.

GoTo: Outdial: with Centrex

The GoTo branch can be used in conjunction with Centrex lines to transfer to an off-premises location. It can be programmed to include, in its “dial string,” pauses, flash hooks, etc. (Since you press the # key to confirm, you must use this special code technique to actually program a # DTMF tone, if required.) Use a **scroll (▼ or ▲)** key to select the appropriate code:

Code	Produces
#	# DTMF tone
*	* DTMF tone
F	Flash hook
P	Two-second delay
E	The most recently attempted extension number

The system will dial the string as programmed, then release the call to Centrex to complete the connection.

Example: *To create an outdial string that . . .* *Do the following . . .*

- Sends a flash hook;
 - Pauses two seconds;
 - Dials 9;
 - Pauses two seconds;
 - Dials 972 555-6544 (a local 10-digit number, in this example);
 - Goes on-hook.
1. Tap a scroll key until you see *F* on the display.
 2. Press #.
 3. Tap a scroll key until you see *P* on the display.
 4. Press #.
 5. Press 9.
 6. Tap a scroll key until you see *P* on the display.
 7. Press #.
 8. Dial **9 7 2 5 5 6 5 4 4**.
 9. Press #. The display will show:
FP9P9725556544

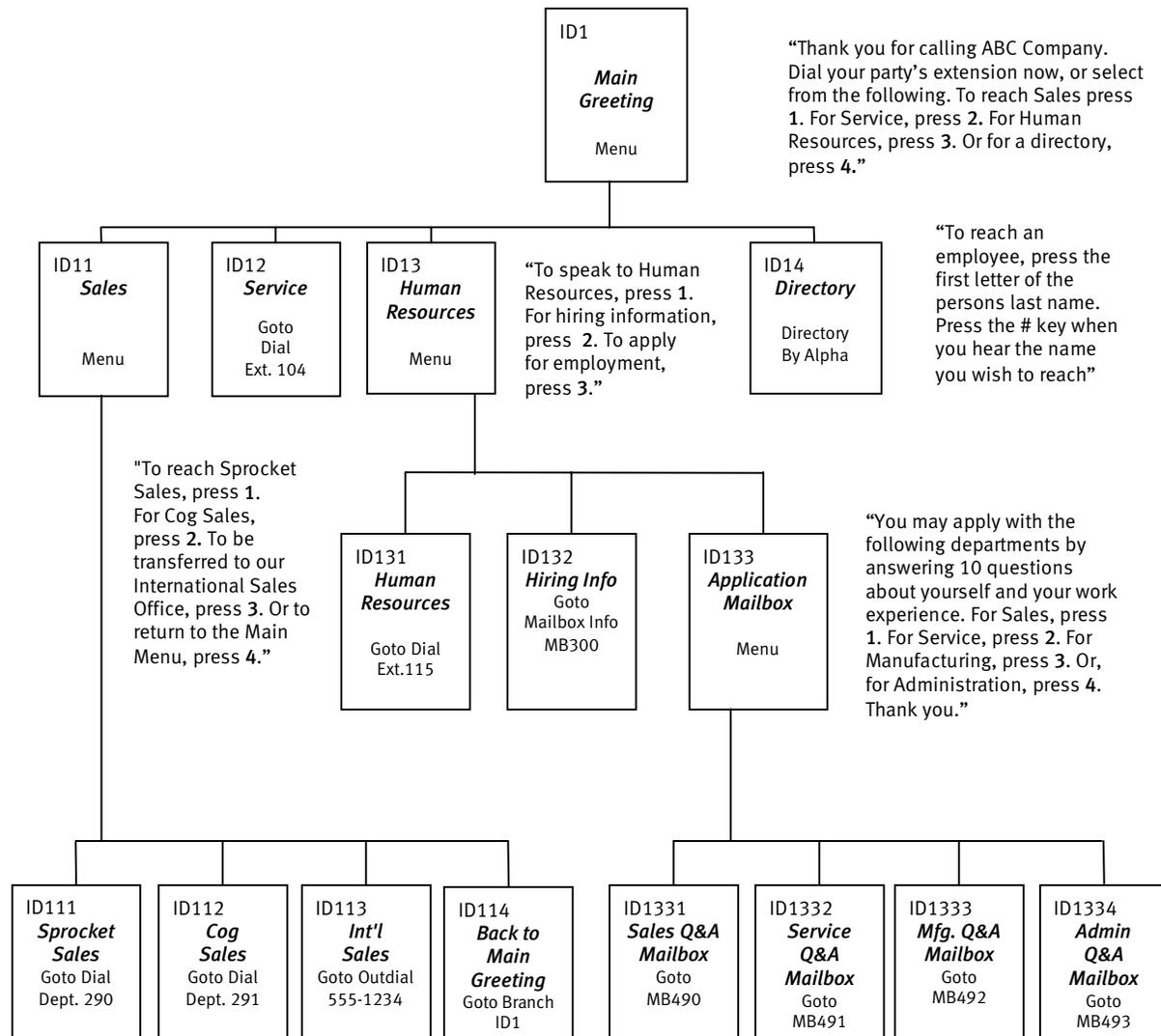
Directory branch

A **directory branch** allows the caller to be connected to an employee by selecting his or her name from a list played. Two types of directories are available:

- **All-names**
 - The caller selects the person he wishes to reach from the playback of all recorded names (use this if there are any about 10 or fewer names in the directory).
- **By-alpha**
 - The system prompts the caller to enter the first letter of the individual's last name.²
 - The system then plays the matched names to the caller **in the order recorded**.
 - A second prompt then instructs the caller to press # when he/she hears the name of the individual.

Note: The actual recording of the names and alpha “key” entered (if the directory type is by-alpha) will come later in Function 62 (see page I.2). **The directory branch(es) will not be enabled until at least one name has been recorded.**

² For a first-name prompt, you must re-record the branch in Function 61 (see page I.1).



(In the example above, the branch IDs and branch titles shown are for programming purposes only. The caller needs only to press 1, 2, etc., to move through the choices.)

Here is the sequence for programming the IP Series system’s auto attendant:

- Branch ID** — A numeric designator which indicates its location and relationship to the other branches. There can be up to 6 levels of branches, the first level being a single digit, the second level being two digits, and so on.
The Main Greeting is ID1 (or additionally 2 through 8 if a different greetings for different Lines is desired), then each of its sub-branches will have that number plus an additional digit of its own (corresponding to choices given to the caller, shown here in bold): 11, 12, 13, etc. Menu Branch 123 would have sub-branches 1231, 1232, etc.
- Type** — Select a Menu, GoTo, or Directory Branch.
- Name** — Enter the name to help identify the branch for later programming changes and is also the source for LCD display information at user’s phones and reports.

4. Destination

Each branch type has different possible destinations as indicated:

Branch Type	Destination(s)
Menu	Sub-branches (choices 1–8)
GoTo	Dial, mailbox, branch or outdial
Directory	List of names (entered in Function 62) — all or alpha

Additional notes

- **Automatic disconnect** — If ID9999 is programmed as a destination, the call will be automatically disconnected.
- **Call forward busy/no answer** — Can be programmed (and will be prompted for) only if a trunk-to-trunk outdial number is the destination of a GoTo branch.
- **Call forward no response** — Programmed (and will be prompted for) only for a menu or directory branch.
- **Deleting a branch** — To delete a previously created branch, enter the branch ID, press **HOLD**, and confirm by pressing a **scroll (▼ or ▲)** key and #.

Function 42: Announce extension number

If a caller selects a name from a Directory Branch, the system can be set to announce the extension number prior to transferring the call. This provides the caller with the extension number for future direct dialing from a Menu Branch such as the Main Greeting. This feature should not be used where individual privacy is desired.

Default: Enabled.

Function 43: Automatic day/night mode table

You program the day/night mode table by selecting the day of the week, then entering the start time, and then selecting the mode — day, night, day2 or night2. At the time you've programmed, the appropriate greeting for that mode will play and the system will follow the appropriate day or night forwarding. Day forwarding is the same for both day mode and day2 mode; night forwarding is the same for both night mode and night2 mode. Enter the times in military time (0000–2359). Each day can have up to six different times.

Note: Only branches ID1 through ID8 have a day, day2, night and night2 greeting.

1. Select the day of the week by pressing a **scroll (▼ or ▲)** key.
2. Press # to confirm.
3. Enter the day's start time in 24-hour format.
4. Press # to confirm.
5. Select the mode — day, night, day2 or night2 — by pressing a **scroll (▼ or ▲)** key.
6. Press # to confirm.
7. Repeat steps 3–6 for the day's next setting or press # again to program another day.
8. When finished, press # again to exit.

Note: To delete an entry, press **HOLD**.

Note: The system must be in the *auto* mode to follow the schedule.

Day/night mode worksheet example

In the example below, the company has:

- Day mode programmed for: 8 AM to 12 noon Monday, Tuesday, Thursday and Friday; 8 AM to 2 PM Wednesday and Saturday; and 1 PM to 5 PM Monday, Tuesday, Thursday, and Friday.
- Night mode programmed for after 5 PM.
- Night2 mode for Wednesday and Saturday after 2 PM and all day Sunday.
- Day2 mode for lunchtime Monday, Tuesday, Thursday and Friday.

Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.
0800 D						
1200 D2	1200 D2	1400 N2	1200 D2	1200 D2	1400 N2	
1300 D	1300 D		1300 D	1300 D		
1700 N	1700 N		1700 N	1700 N		

Remote setting of day, night, holiday and auto modes

Normally, the system's day/night mode operation will be manually controlled at an IP Feature Phone and/or set to follow automatically the day/night mode tables (programmed by the Installer). Also, the Administrator can remotely change the mode and/or re-record ID1 and the holiday greeting to handle unexpected closings, such as for inclement weather.

Remotely logging into the system with either the Installer password or the Administrator password lets the caller re-record the ID1 greetings (day, night, day2 and night2) and the holiday greeting, as well as change the mode to day/night/holiday/day2/night2 (or auto).

To change the answer mode and main greetings remotely:

1. Dial the main number that the auto attendant answers.
2. At the main greeting, enter ****789#** or ****456#** (or the new password) — to enter remote programming mode. You'll hear prompts (see "Prompts for remote settings: An outline," page G.7) that will allow you to change the answer mode (day, night, holiday, day2, night2 or auto) and re-record the day, night and holiday greetings. When you select any of the "record ... greeting" prompts, you'll hear the current greeting and then be prompted to press 1 to record a new greeting.
3. To exit or go back to the previous section, press * (you may also exit by hanging up).

For more information on day, night and holiday modes, refer to:

- "Function 61: Re-record system prompts," page I.1.
- "Live Outside Calls • Operator Station," in the *IP Series User's Guide* (#0450-0189).

Prompts for remote settings: an outline

- 1 Set answer mode**
 - 1 Day mode
 - 2 Night mode
 - 3 Holiday mode
 - 4 Use day/night table*
 - 5 Day2 mode
 - 6 Night2 mode
- 2 Record holiday main greeting**
- 3 Record daytime main greeting**
- 4 Record nighttime main greeting**
- 5 Record day2 main greeting**
- 6 Record night2 main greeting**

* This is used if the installer has programmed an automatic calendar.

(This page included for pagination purposes only.)

Function 5: Voice mail programming

To simplify initial installation, all programmed extensions will automatically have the generic personal greeting, *“You have reached the mailbox for extension [xxx].”* The mailbox user should replace this with a personalized greeting.

Function 51: Maximum message length

Although the system will store only the actual message as left by the caller, the time set here is the maximum time to allow for a message. The range is 1–30 minutes for messages, and 1–120 minutes for a recording. (The maximum number of messages and recordings in a mailbox, regardless of length, is 128.)

Default: 3 (minutes) for messages, 10 (minutes) for recordings.

Function 52: Message purge control

To avoid having unneeded messages filling up the system’s memory, values entered here will establish how messages are to be automatically erased by the system if its Memory Module’s free space gets too low. The system’s purge routine will begin only when the system’s Memory Module is 95% full and will remove messages, down to 90% full, according to the following programmed values:

- **New messages** older than the number of days programmed
- **Old messages** older than the number of days programmed
- **Group messages** older than the number of days programmed
- **Recordings** that are older than the days indicated.

The range for each item is 0–365 days. A “0” indicates that a type of message is not to be removed unless deleted by the user.

Example: To set the system to erase old messages more than 3 days old and group messages more than 5 days older and **not** to erase any new messages or recordings (if the system’s Memory Module becomes full), enter **0, 3, 5, and 0** as prompted.

Note: If the Memory Module becomes full but no message or recording can be purged according to the settings, callers will hear a “voice-mail-full” prompt until free space becomes available on the Memory Module.

Note: This feature **does not** affect the Message Recycle Bin capability of each station.

Default: 0, 0, 0, 0.

Function 53: Guest/info mailboxes

Mailboxes numbered 300–489 can be programmed as either a guest or info mailbox. Enter the mailbox number and select *Guest* or *Info* by pressing a **scroll (▼ or ▲)** key.

Guest mailboxes

Guest mailboxes are designed to be used by personnel, such as in outside sales or manufacturing, who do not have an extension assigned to them. A guest mailbox requires no programming other than the assigning of a name.

Note: A guest mailbox can be handled like a regular extension (*i.e.*, listed in the directory, assigned a station key, etc.).

If a programmable feature key is programmed as a virtual mailbox key with a guest mailbox number, the key's LED will blink, to indicate that new messages exist.³ To retrieve messages from a station, press **VOICEMAIL**, * and then either the DSS key or dialing the mailbox number.

To record a greeting, press **PROG/HELP** * and enter the mailbox number; then press # to confirm, and follow the prompts. The default password is the mailbox number.

To retrieve messages from the outside, press * and the mailbox number **during the Main Greeting**.

Default: 300–489 as Guest.

Info mailboxes

Info mailboxes can be used to give callers information on a variety of different subjects by “publishing” these mailbox numbers. Info Mailboxes are identical to Guest Mailboxes except that the caller will not be given a record tone after the personal greeting (the information to be played). Instead, the caller will be forwarded as programmed in this function (default is the caller will be disconnected after the information is played). The maximum length of the record time is 14 minutes.

Guest/info mailboxes are created or deleted here, but are turned “on” only when a personal greeting (the information to be played) has been recorded. Deleting the personal greetings will turn “off” the mailbox.

To record a greeting, press **PROG/HELP** * and enter the mailbox number; then press # to confirm, and follow the prompts. The default password is the mailbox number.

Below is an example of a completed Programming Worksheet, showing the sequence of programming:

1.	2.	3.	4.	5.
MB	Name	Type	CF day	CF night
300	Dana	Guest		
302	Literature	Info	X/MB/ID	X/MB/ID

³ Otherwise, the key is a DSS key that allows for single-key transfer of a call with no message indication.

Each programming step is defined as follows:

1. **Mailbox number** — Enter a mailbox number, 300–489.
2. **Name** — The mailbox name is used for the LCD display, reports, and as a programming aid. The name length can be no longer than 10 characters (see “Entering alphanumeric characters,” page C.2).
Default: The Mailbox number.
3. **Type** — Select a mailbox type: Guest or Info.
Default: Guest.
4. & 5. **Call forward (info mailbox only)** — An info mailbox can be set to call forward after the personal greeting has played to an extension, department, a mailbox or a branch ID for day mode and differently for night mode.
Default: ID9999 (automatic disconnect)

Function 54: Group mailboxes and the broadcast mailbox

Broadcast mailbox

Mailbox 500, the **broadcast mailbox**, is a special group mailbox which can be used to leave messages for all of the system’s station users (extensions 100–195 and 200–229) who have recorded a personal greeting. The broadcast mailbox’s user list cannot be edited. Guest mailboxes are not included in the broadcast group.

Group mailboxes

You can assign up to 16 group mailboxes (501–516) to the IP Series system; each group mailbox can have up to 32 members. Anyone who knows the password can leave messages for all users listed as members of that group and who have recorded a personal greeting. The Installer, Administrator or group mailbox “owner(s)” may set or change the list of Group Mailbox members. To record a greeting, press **PROG/HELP** * followed by the mailbox number; then press **#** to confirm, and follow the prompts. The default password is the mailbox number.

Important: A group mailbox is turned “on” (able to record and playback messages) **only** when its “owner” has recorded a greeting for it, such as “*This is the group mailbox for East Coast Regional Sales.*” Similarly, deleting the group mailbox greeting will turn “off” the group mailbox; any outstanding messages will remain in its members’ mailboxes until erased by each member.

Note: If 0 (zero) is programmed as the password, **anyone** can leave group messages or program the Group Mailbox.

Note: If a user saves a group message, it will be saved as a new message.

	501	502
Members	102	122
	104	403
	106	414
	107	

The sequence of programming is as follows:

1. **Enter the group mailbox number** — Range: 501–516.
2. **Enter group member mailboxes’ numbers** — Separate each by #; enter ## to end the list.
Range: User mailboxes (100–195 and 200–229) and guest mailboxes (300–489).

Function 55: Message notification

On a mailbox-by-mailbox basis for user or guest mailboxes, the system can be programmed to call an off-premises number or another extension to deliver messages and/or dial to an external commercial paging network to activate a user's pager. The IP Series system will call and/or page when the first new message has been left in a mailbox and will repeat (at the interval of minutes programmed in this function) until the new message(s) have been deleted, saved or moved.

The user can program the numbers and delay and can also select to have only messages marked as urgent delivered.

The Installer and Administrator can set, on an individual-station basis:

- The number to be called
- A delay period
- The number of attempts (maximum of 99)
- The interval between attempts
- A "quiet period" to suspend phone delivery — *e.g.*, late at night (the quiet period is an on-and-off time that applies to all days of the week)

Function 551: Station delivery options

Programming of the station options, as shown below, can be performed by the Installer or Administrator. In addition, the user can change his phone number and delay time or pager number (but not pager delay time). The phone number's maximum length is 24 digits.

	1. Number	2. Delay	3. Attempts	4. Interval	5. Quiet on	6. Quiet off
1. Phone	2145556789	30	6	60	10:30PM	7:15AM
2. Pager	2145551234	0	10	30		

1. Enter the **extension number** to program, indicating whether you're programming a phone number or a pager number (press **1** for phone, **2** for pager).
2. Enter the phone/pager **number** to be dialed (**without** the CO Line Group [*9, 8 or 71-76*]).
3. Enter the **delay** — how many minutes the system is to wait before dialing the phone number. This allows the user to pick up a message if he is in the office.
Range: 0–500. **Default:** 0.
4. Enter the number of **attempts** — how many times that the system will call/page.
Range: 0–99. (0 turns off delivery.) **Default:** 3.
5. Enter the **interval** — how many minutes should elapse between attempts.
Range: 10–1440. **Default:** 30.
6. Enter the **quiet period on** setting — when the quiet period should begin. (Phone number only.)
Default: (None.)
7. Enter the **quiet period off** setting — when the quiet period should end. (Phone number only.)
Default: (None.)

Function 552: Delivery/paging parameters

The sequence of programming is as follows:

1. **CO line access** — Enter the CO Line Group (9, 8, or 71–76) that is to be accessed for delivery.
Default: 9.
2. **Maximum lines** — Enter the maximum number of lines (in the selected CO line group) that the system can access simultaneously. Make enough lines available to accommodate high notification traffic (but be careful: if you make available **all** lines in the selected line group **and** high notification traffic occurs, the system could tie up all lines).
Range: 1–19. **Default:** 1.
3. **Pager dialing pause** — When paging, the IP Series system will send the mailbox number to be shown in the pager's display. To allow time for the paging service to answer, enter the pause, in seconds, that is to occur between when the IP Series system dials the pager number and when it then dials the mailbox number.
Range: 0–20. **Default:** 6.

Function 56: Cascade paging mailboxes

In addition to individual mailbox paging, the system can support up to 10 cascade paging mailboxes (520–529). These can be assigned to anyone who requires escalating levels of paging beyond the single level available in all user mailboxes. In this function, you program the paging numbers and number of times each is to be paged before the next paging number is added; additionally, the mailbox owner can program these settings. To record a greeting, press **PROG/HELP *** and enter the mailbox number; then press **#** and follow the prompts. The default password is the mailbox number. Press either **1** for cascade paging mailbox options or **2** for cascade paging mailbox parameters.

Cascade paging mailbox options

The user can program up to three paging numbers, of up to 24 digits each, to be paged whenever the mailbox takes a new or urgent message. The system will page the first paging number (for the number of times listed), then add the second paging number (for the number of times listed), then add the third paging number and will continue to page all three pagers until the message has been retrieved.

1. MB	4. 1st Number	5. Attempts	6. 2nd Number	7. Attempts	8. 3rd Number
520	2145553232	2	2145554254	3	214555452

4. Press **PROG/HELP *** and enter the **mailbox number (range: 520–529)**; then press **#** to confirm.
Note: The default password is the mailbox number.
5. Press **6** for pager number programming and press **#** to confirm.
6. Press **1** to enter message notification numbers.
7. Enter the **first pager number** — the number to be dialed (**without** the CO Line Group [9, 8 or 71–76]) — and press **#** to confirm.
8. Enter the **attempts** — how many times the system will page (up to 20) before adding the second pager number. **Range:** 0–99. (0 turns off delivery.) Press **#** to confirm.
9. Enter the **second pager number** and press **#** to confirm.
10. Enter the **attempts** for the second pager number and press **#** to confirm.
11. Enter the **third pager number** and press **#** to confirm.

Cascade paging mailbox parameters

The cascade paging mailboxes will use the same CO line group and pager dialing pause as programmed in Function 552 (see page H.5). You set the paging interval — the time between each attempt — for each individual cascade paging mailbox.

1. Press **PROG/HELP** * and enter the **mailbox number (range: 520–529)**; then press **#** to confirm.
Note: The default password is the mailbox number.
2. Press **6** for pager number programming and press **#** to confirm.
3. Press **2** for message delivery parameters (interval) and press **#** to confirm.
4. Enter the number of minutes for the interval between attempts and press **#** to confirm.
Range: 10–1440. **Default:** 30.

Function 57: Q & A mailboxes

You can create up to 10 **question and answer (Q & A) mailboxes** (490–499). Each Q & A mailbox owner can record up to 10 questions. The questions are recorded in the same manner as recording users' multiple personal greetings (see *Power user's guide*).

The individual answer segments recorded by the caller are stored as a single message, with the answer segments separated by short beep tones. Each answer segment's maximum length will be as programmed in Function 51 (see page H.1). Normal message handling capability — delete, save, etc. — applies to the entire message (all segments).

The caller, when recording each answer, can be instructed to conclude by pressing **1** or to pause for the next question (the system advances when it detects either a three-second period of silence or the pressing of **1**) — e.g., "Record your name at the tone and press **1** when finished"... "Record your address at the tone and press **1** when finished."

If the caller fails to respond to two questions in a row, the system disconnects the call.

Important: This programming creates or deletes Q & A mailboxes, but these mailboxes are "turned on" **only** when the mailbox owner has recorded questions. Similarly, deleting all questions "turns off" the mailbox.

To record questions, press **PROG/HELP** * and enter the mailbox number; then press **#** and follow the prompts. The default password is the mailbox number.

Below is an example of a completed Programming Worksheet.

1.	2.	3.	4.
MB	Name	CF day	CF night
490	Employment	X/MB/ID	X/MB/ID
491	Survey	X/MB/ID	X/MB/ID

Each programming step is defined as follows:

1. **Mailbox number** — Enter a mailbox number 490 to 499.
2. **Name** — The mailbox name is used for the LCD display, reports, and as a programming aid. The name length can be no longer than 10 characters (see "Entering alphanumeric characters," page C.2).
Default: The mailbox number.

3. & 4. **Call forward** — A Q & A mailbox can be set to call forward, after the last question has been answered, to an extension, department, a mailbox or a branch ID for day mode and differently for night mode.
Default: ID9999 (automatic disconnect).
-

Function 58: Message move and delete

When enabled, this prompts the mailbox user, when moving a message, to do one of the following:

- Move the message and save a copy in his/her mailbox.
- Move the message and delete it from his/her mailbox.

Default: Disabled.

(This page included for pagination purposes only.)

Function 6: Recording

Function 61: Re-record system prompts and ID branches

The IP Series system plays the **system prompts** to an outside caller at different points in the call routing or mailbox functions. These system prompts have been pre-recorded at the factory but you may re-record them, if preferred — *e.g.*, in a different voice or with different instructions.

The **auto attendant branch prompts** (such as the main greeting or sub-menus) are also recorded here — enter the branch ID number as the prompt number (*e.g.*, for branch ID 1, enter **1** and press **#**).

Note: Auto attendant branch IDs 1–8 include prompts for two daytime and two nighttime greetings. For information on how these prompts are used, refer to:

- “Remote setting of modes,” page G.6.
- “Live Outside Calls • Operator Station,” in the *IP Series User’s Guide* (#0450-0189).

Recording a prompt

Enter the branch ID number or system prompt and press **#**.

Practice recording and re-recording the prompt (start and stop by pressing **1**).

4. When you have finished recording, press **#** to confirm.

Note: Deleting a system prompt by pressing **HOLD** (instead of **#**) restores to the default recording.

System prompts

- **Busy Prompt: 530** — Plays to the outside caller if an extension is busy.
Default: *“That extension is busy.”*
- **No Answer Prompt: 531** — Plays to the caller if an extension does not answer.
Default: *“That extension does not answer.”*
- **Hold Prompt: 532** — Plays to the caller who makes a menu selection or enters an extension number.
Default: *“One moment, please.”*
- **Q/Z Prompt: 534** — Plays to a caller who has selected an alphabetic directory; instructs the caller to press **1** for the letters *Q* or *Z* since these two letters do not appear on the phone keypad; plays at the end of the first directory prompt (but only if a name in the directory starts with a *Q* or *Z*).
Default: *“For the letters Q or Z, use key number 1.”*
- **No Names Matched Prompt: 535** — Played to the caller if, in a directory branch, the first letter he/she selected does not have any names associated with it, or if he/she has listened to all of the names played and has not made a selection. After playing the prompt, the IP Series system forwards the call to the extension, branch or mailbox as programmed in call forward no response.
Default: *“No names matched; one moment please.”*
- **End of Message Prompt: 537** — Plays after a caller leaving a message presses **1** to stop recording (or when he/she reaches the maximum message length); the prompt then tells the caller his/her options.
Default: *“To continue this recording, press 1; to return to the main menu, press 8; or, if finished, press * and hang up.”*

- **ACD Queue Prompt: 538** — The first prompt played to a caller when all extensions are busy in an ACD department.
Default: *“All agents are currently assisting other customers. Please hold; your call will be answered in the order received.”*
- **ACD Hold Prompt: 539** — Is periodically played to callers on hold in an ACD department when all extensions are busy.
Default: *“All agents are still busy assisting other customers. Please hold; your call will be answered in the order received.”*
- **Holiday Main Greeting Prompt: 540** — Plays to callers when the system has been manually placed in holiday mode.
Default: *“Thank you for calling. Our office is closed in observance of the holiday. You may dial your party’s extension, at any time, or please call back during regular business hours.”*
Note: While in holiday mode, the IP Series system follows night mode programming for call routing. The day/night mode setting and holiday greeting can be activated remotely (see “Remote setting of modes,” page G.6).

Function 62: Record directory names

This function is accessible only if a Directory Branch has been created as part of Auto Attendant programming. Enter the extension number and record the name (and, if this is a by-alpha branch, enter the name key.)

Important: Make photocopies of the blank worksheet for preparing directories and making future changes. As names change, the Administrator can enter this function and change any field via the Administrator password.

1. Ext.	2. Recorded name	3. Key
102	George Straite	4
113	Janet Smith	5

Each programming step is defined as follows:

1. **Extension number** — Enter the extension number for the directory name.
2. **Record name** — Press **1** to begin recording and press **1** again when finished.
3. **Name key** — (Necessary if the directory type is by-alpha [see Function 41, page G.1].)
Enter the numeric equivalent to the letters appearing on a phone keypad (for Q or Z, use 1).

Note: To re-record the prompt that says, “Enter the first letter of the person’s last name,” you must enter Function 61 and then enter the ID number of the directory branch.

Function 63: Message-on-hold (MOH) programming

MOH can be:

- A live feed from an external music source connected to the MOH connector located on the front of the IP PBX.
- One of three default, generic MOHs pre-recorded by the factory.
- One of up to five custom MOHs loaded into the system by using an external device connected to the MOH connector.

Note: When you use either the generic or custom MOH recordings, callers while on hold have the ability to dial 0 (zero), an extension number or a department number. Callers in an ACD hold or queue can dial only either 0 (zero) or an extension number (this capability isn't available when you use the external MOH source).

Note: If ACD is used, we recommend that you use Prompt 590, Prompt 591 or a custom prompt without periodic "voice-overs," since the ACD Hold Prompt **also** will be played while a caller is on hold.

Function 631: MOH source

This selects the source that will be played to callers on hold.

Using the source stored on the Memory Module (591–598) allows callers to dial off hold.

Code	Source
590	Live external source
591	Pre-recorded music
592	Pre-recorded with <i>"please continue to hold"</i>
593	Pre-recorded with <i>"dial 0 or extension from hold"</i>
594-598	Customer-recorded message on hold

Default: 592 (generic message-on-hold).

Function 632: MOH recording

1. Connect the message/music source to the MOH port on the IP PBX.

Note: The connector is monophonic-only — if you use a stereo source, you must either set it to output mono, if possible, or use a stereo-to-mono conversion cable (or adapter).

2. Enter the prompt number to be recorded.
3. Press 1 to begin recording. To aid you in queuing, the source will be played through the phone's speaker.

Note: The recorded material should not have a "beginning" or "end" — so that playback can loop continuously.

4. Press 1 when finished. The recording will play back so you can review it.
5. Press # to accept the recording.

Function 633: MOH volume

If a custom MOH is recorded, the output volume can be adjusted in this function.

Range: 1 (faint)–12 (loudest).

Default: 6.

- If an external audio source such as a radio is used for MOH, adjust the volume at the source.
- If an internal source is used but callers cannot dial off hold, lower the MOH volume.
- To turn **live** MOH volume completely off, turn off volume at the source.
- To turn **recorded** MOH volume completely off, use Function 631 to select one of the prompts in the range of 594–598, but make sure it's blank. These prompts are blank by default; if you have recorded some audio on all of them, just select one and record a few seconds of silence.

Function 7: Reports

SMDR port

(Called “Port 1” by the display.)

No programming is necessary. Connect a PC, call accounting system or serial printer to the SMDR serial port of the system. Call records are output in real time. The output from the serial port is: 8 data bits, 1 stop bit, and no parity, 38,400 (38.4 K) baud. The IP Series system’s SMDR output format is identical to the standard Panasonic® DBS® format and is as shown below:

```

          1           2           3           4           5           6           7
123456789012345678901234567890123456789012345678901234567890123456789
T MM/DD HH:MM:SS HH:MM:SS NNN XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX NN
0 12/21 11:32:12 00:03:29 104                               9725552100      14
I 12/21 11:45:22 00:18:14 123 9045551212                NATIONAL CAR

```

The columns are:

- **Call type** — Outbound (“O”), inbound (“I”) or transferred (“T”)
- **Date**
- **Start time**
- **Duration**
- **Extension number**
- **Digits dialed** (right-justified)/**Caller ID** (left-justified)
- **Line number**

Reporting conventions and rules

- Inbound and outbound call records are generated only for calls between a station and a CO line. The duration of each call record represents the period of time that that station controlled its portion of a call. A record is generated each time a station: disconnects, places a call on park, or transfers a call. A single CO call could be included in multiple records if it is transferred from station to station.
- The period that calls have been placed on hold, or during a supervised transfer that was ultimately not transferred are included in the station's record.
- The period that calls are on park, in the auto attendant, leaving/retrieving voicemail, or in an ACD queue are not included in call records.
- A new record begins when a station answers a call or a park recall.
- Records will be generated independently for all stations in a conference; if more than one CO line is involved, calls records will be associated with only the last line disconnected.
- Outbound calls begin a call record 10 seconds after the call has cleared the IP Series system’s toll restriction.

Note: It is the the call accounting system’s responsibility to filter out very short, potentially uncompleted calls by using the call accounting system’s “grace period” feature.

- An engineering function can adjust the start-call-record parameter from 0 (immediate) to 100 seconds. Default = 10 sec.

Maintenance port

(Called “Port 2” by the display.)

The baud rate for this port is set in Function 18 (see page D.4). You can connect the PC program, *Esi-Access*, or a standard serial printer (or PC used to capture reports) to the port. Reports requested through Function 7 will print to this port.

Using the PC program, Esi-Access

Use an RS-232C cable to connect a computer’s serial port to the IP Series system’s Maintenance port.

Once connected, the installer can:

- Program the system using the PC programming package, *Esi-Access*.
- Capture debug information.
- Update system software.
- Perform a back-up/restore of system configuration.
- Print DSS labels.

Report printing

The system’s built-in reports can be output to a printer or a PC via the Maintenance port. When printing captured reports from the PC to a laser printer, use a fixed monoproportional font (such as *Courier New*), 9 points or smaller.

From either the Installer or Administrator programming menu, select the desired report as shown in Functions 71–75 (*below*). The reports can be printed with either: (1) the data saved for inclusion in future reports, or (2) the data and totals cleared. (You **can’t** clear data in the system program report, system speed dial report and station detail report)

Outbound calls shorter than one minute are not counted in system totals.

Reporting functions

- **Function 71: System program report (Installer only⁴)** — Provides a hard copy of the system’s current programming. Compare this vs. the programmer’s worksheet to verify the accuracy of the programmed data.
- **Function 72: Line/auto attendant report** — Provides statistics to aid in analysis of Line usage and requirements.
- **Function 73: Extension/department summary report** — Provides extension and department usage.
- **Function 74: Voice mail statistics report** — Provides statistics indicating the message activity in each mailbox since the data was last cleared.
- **Function 75: System speed dial list** — Lists the current system speed dial numbers. Distribute a copy to those who are authorized to use them.

⁴ The Administrator **cannot** run Function 71.

Function 8: IP PBX programming

This function lets the System Administrator or Installer perform the programming steps that allow the hardware components — IP PBXs and IP Feature Phones — to communicate with each other.

Note: Neither the IP PBX nor the IP phones use any subnet masking; that is, their subnet mask is *0.0.0.0*. In other words, the IP PBX and the phones will communicate with any other device on their Ethernet segment, as long as that device has an IP address.

When entering F8, the first screen will appear as follows. Press **1** to manage licenses, **2** to program the local IP PBX, and **3** to program Esi-Link (multisite) capabilities.

```
IP PROGRAMMING
CMD: _
```

Function 82: Local IP PBX programming

Function 82 is an Administrator-level function used to program the local IP PBX so that it can communicate with the phones on its own network segment (“local phones”), with Remote IP Feature Phones, and with other IP PBXs. The administrator will be able to:

- Assign IP addresses and UDP ports to the IP PBX and the local IP phones
- Set limits to the number of available remote talk paths
- Set up the pool of IP addresses used by local IP phones

Note: If you are supporting both IP Series and IP-compatible IVX products, be aware that the latter feature is used only by the IP 200 and IP 40, **not** by IVX products.

Function 821: Program IP PBX addresses

Assign IP address to the IP PBX

The administrator assigns an IP address to the IP PBX, using four-octet (dotted-quad) notation. The default is *192.168.248.1*. Press **#** for the periods between the octets. Press **#** again when finished.

```
PBX PRIVATE IP
192.168.248.1
```

Normally, the IP PBXs will use private IP subnetworks (as defined in RFC 1597^{*}) rather than public subnetworks.

For simplicity’s sake, it is a good idea to keep all the IP Series components within the same address range. If the administrator chooses to do this, it would again be a good idea to assign to the IP PBX the first available address in the range. For example, if the user plans to use the IP addresses *192.168.210.1* through *192.168.210.97* as the range of IP addresses, the *.1* address would usually be assigned to the IP PBX, with the remainder of that block being made available to the phones.

Important: The IP PBX’s MAC address will appear in the display. **Write down this address.** It is **needed** for programming Esi-Link access to this IP PBX from other locations.

^{*} <http://www.rfc-editor.org/rfc/rfc1597.txt>.

Enter gateway's IP address

Although it can use a public IP address, the IP PBX will normally use private addressing and sit behind some sort of address-translation device, such as a NAT⁵-enabled router. Whatever device provides a public IP address to the network on which the IP PBX resides is the gateway. This device's address is often called the *default gateway address*.

For instance: a company's Dallas office uses DSL as its broadband connection, and the DSL line is terminated at a DSL router that sits on the LAN. That router will have two interfaces: the WAN side, which must have a public (globally-addressable) IP address, and the LAN side, which normally has a private (non-routable) IP address. The private IP address on the LAN interface is the address that is used in this programming step.

Note: The IP addresses of the IP PBX and the LAN interface do not necessarily have to be on the same subnet.

Enter the IP address of the gateway's LAN interface in dotted-quad notation, using the # key as the dot between the octets. Press # again when finished.

PBX GATEWAY IP <u>0</u> .0.0.0
--

Enter remote-access IP address

The remote-access IP address is the address the Remote IP Feature Phone and other IP PBXs connected via Esi-Link will use to access the local IP PBX. (If remote access to the IP PBX is not planned, this parameter can be left at default.) If a gateway device is used to connect an IP PBX on a private network to a public or WAN connection, the remote access IP address is the public or WAN address of the gateway. If a public IP address is assigned as the PBX Private IP Address, the same IP address will be entered here.

Enter the remote-access IP address in dotted-quad notation, using the # key as the dot between the octets. Press # again when finished.

RMT ACCESS IP <u>0</u> .0.0.0

Assign UDP port

UDP ports are used to provide security to the system; only traffic destined for a specific UDP port will be allowed to pass through the gateway device. The administrator will choose a UDP port range 10000–65000, inclusive, but will enter only the first two digits of that range. For example, the range of 10000–10999 would be entered as **10**; the range of 56000–56999 would be entered as **56**. The default is 59.

BASE UDP PORT ??000: <u>59</u>
--

The IP PBX will automatically be assigned the first port in that range (in this example, 59001) and the IP phones will automatically have their extension number appended to the first two digits (*e.g.*, extension 123 will be assigned a UDP port of 59123). In fact, upon entering the second digit of the base number (in this case, the 9), the display will automatically populate the remaining three places in the number with the digits 001.

Press # when finished.

⁵ Network address translation.

Note that only the first 195 ports within that range are actually used. The gateway router will need to be programmed to open UDP ports xx001–xx195, inclusive, where xx represents the two-digit number that designates the UDP port range.

Example: The System Administrator for IP PBX 705 in Chicago realizes that he is already using UDP port 59123, which falls in the default range, so he decides instead to use 56000 as the base UDP port. He will use F82 to assign that range by pressing 5 6 #. The IP PBX will automatically be assigned a UDP port of 56001. Extension 100 will automatically be assigned a UDP port 56100, x121 will have a UDP port of 56121, and so on. (In a multisite environment, the administrator in Chicago must ensure that all other administrators in the company know that he is using 56000 as his base UDP port, so that they can program their IP PBXs accordingly.)

Function 822: Assign IP address pool for local IP phones

Note: If you are supporting both IP Series and IP-compatible IVX products, be aware that this feature is used only by the IP 200 and IP 40, **not** by IVX products. On an IVX product, press # until you're back to the F82 display.

The administrator determines the IP address range to be used by the phones. The DHCP program will assign the IP phone's IP address from this pool. The IP addresses should, for ease of use, come from the same subnetwork as the IP PBX. For example, if the IP PBX is using *192.168.210.1*, the IP phones should use a block of 96 addresses from within that subnet. The default starting IP address is *192.168.248.2*.

The administrator will enter only the first IP address to be used, followed by the # key. Each extension that comes on line will be assigned the next available address. Specific IP addresses from within the subnet can be assigned using Function 82. Press the # key to enter the dot between the octets. Press # again when finished.

```
STARTING IP ADDR
192.168.248.2
```

Function 823: Remote channels

This function sets the number of **remote channels** available for use by Remote IP Feature Phones. This is allowed so that such phones don't use up all network bandwidth. A conversation over a Remote IP Feature Phone uses approximately 44K of bandwidth; so, depending on the amount of available bandwidth on the network, you may want to restrict the amount of bandwidth used by Remote IP Feature Phones and Esi-Link.

Example: If total available network bandwidth between sites is 256K and five remote channels are in use simultaneously (thus consuming approximately 86% of the 256K), the network will become congested, having an adverse impact on other data transmissions (*e.g.*, file movement, printing, etc.) on the site-to-site network.

You must have a Remote Network Card (RNC) installed to set this parameter. If you have an RNC 3 card installed, you can set one, two or three remote channels; if you have an RNC 12 card installed, you can set one to 12 remote channels.

Enter the number of remote channels and press # to confirm.

```
REMOTE
CHANNELS: 12
```

Function 83: Esi-Link programming

Function 83 is used to program the information required for Esi-Link operation between multiple IP PBXs at different locations. **It is critical that programming is consistent and correct at all locations to be connected with Esi-Link.** Location numbers, names, abbreviations, and addressing parameters should be planned out in detail prior to performing Function 83 programming.

```
ESI-LINK MENU
```

F831: Local location number

Before programming Esi-Link parameters for other locations in Function 832, you must program the location number of the local IP PBX. Each IP PBX in an Esi-Link network must have a unique location number. Valid location numbers are in the range of 700–799. This location number will be used for dialing between sites. Press # to confirm.

```
LOCAL LOC NUMBER
7_
```

F832: Adding an Esi-Link location

This function is used to add, modify or view the programming for an Esi-Link location. Add the location for the site to be added or modified. The valid range is 700–799. **This number must be unique for each site.** Press # to confirm.

```
ESI-LINK LOC
NUMBER? _
```

Enter the location name, which can be up to 10 characters in length. Press # to confirm.

```
701 LOC NAME
_
```

Enter the three-character location abbreviation. Press # to confirm.

```
701 LOC ABBRV
_
```

Enter the MAC address of the location's IP PBX. (This can be displayed in Function 821 programming on the IP PBX at that location.) This MAC address is different than the one displayed in Function 821 on the local IP PBX. Press # to confirm. To enter letters in the MAC address:

Press...	To enter...
PROG/HELP	A
REDIAL	B
CONF	C
RELEASE	D
FLASH	E
TRANSFER	F

```
701 HOU    MAC
00304DFFF123
```

Note: All ESI MAC addresses begin with 00304D followed by six alphanumeric characters.

Enter the remote-access IP address for the location's IP PBX. This is the public IP address or private WAN address used for remote access to the location's IP PBX. Enter the address in dotted-quad notation, using the # key as the dot between the octets. Press # again when finished.

```
701 HOU RMT IP
_
```

Enter the UDP port number assigned to the location's IP PBX. Press # to confirm (and complete the Function 832 entries).

```
701 HOU PBX UDP
__001
```

Function 833: Deleting an Esi-Link location

This function is used to delete previously entered information about Esi-Link sites. Enter the location number to be deleted and press # to confirm.

```
ESI-LINK LOC
NUMBER? _
```

When prompted to confirm deletion, press 1. To cancel deletion, press any other key.

```
1 TO DEL LOC
701 HOUSTON
```

Function 834: Programming Esi-Link publish

Each Esi-Link-enabled IP PBX can “publish” (or transmit) lamp appearance updates to the other Esi-Link locations. A combination of up to 30 extensions and mailboxes can be programmed to be published. When programmed on a programmable feature key at another Esi-Link location, lamp appearance for numbers on the Esi-Link publish list will automatically update.

Use the up and down arrow keys to scroll through the list. An entry can be programmed by entering an extension number, CO number, or department group number. A mail box can be entered by pressing the voice mail key followed by the mailbox number. Press # to confirm the entry.

To remove an entry from the list, use the up and down arrow keys to scroll to that entry and press **HOLD** to delete, or enter a new number or mailbox.

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