KI-1614

Telecenter® IV: Compatible Equipment

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Orig. 11/89.

General Information

Scope

This manual is primarily a collection of reports on Electronic Key Service Units (EKSUs) and other generally available equipment that Rauland-Borg engineers have found to work satisfactorily with Telecenter IV extension lines. These reports give an overview of the equipment and provide some pointers on using it with the Telecenter. However, it is up to the system planner to study the manuals provided by the equipment manufacturers and to carry out the internal and interface planning described in the main Telecenter IV manual, KI-1435.

Rauland's Support

Rauland's Telecenter engineers have conducted extensive tests on this equipment and believe that it should perform well. However, because Rauland has no special agreements with any of these vendors, we cannot guarantee satisfaction or assume financial responsibility for problems. The vendors may change their product at any time without advising us, and individual units of these models may vary in tolerance or capability such that they will not perform as well as the units tested in our lab. Ultimately, the Distributor will have to make an informed decision about handling one of these products.

Keep in mind that professional planning, installation, programming, and in-service training are essential to customers in the interconnect market. No equipment or computer program can substitute for quality service from the Distributor to the end user.

Help with Trouble

In case of trouble in a Telecenter system with one of these listed devices, you must determine whether the problem lies with the Rauland-Borg product or the outside vendor's. One way of doing this is to substitute single-line phones on some of the lines where the EKSU normally connects. If these phones work where the EKSU doesn't, then the EKSU and its associated programming and wiring are likely suspects.

In this case, you will have to contact the EKSU manufacturer for assistance or warranty service. While Rauland-Borg cannot assume responsibility for other vendors' products, we do expect any vendors approved by us to provide readily available, expert support for their products.

Help us help you: Keep us informed about your good and bad experiences with these suppliers and their products.

Electronic Key Systems

Typical Applications

Some typical reasons for using a key system are:

- Allowing several people to share the handling of outside calls.
- Connecting PBX and C.O. lines directly to the key system to relieve the Telecenter of some traffic.
- To get special features like autodialing, speakerphone, and hold, or to gain an easier means of doing an important function, like transferring calls.
- To consolidate various lines in a single, space-saving telephone. For instance, the user can have **(a)** Telecenter lines for paging, programming, and other Telecenter functions, as well as for transferring calls directly to that system; **(b)** PBX lines for working directly in that system; and **(c)** central-office (including Centrex) lines for making and receiving outside calls directly.

Planning and Cautions

In planning a key-system installation that will benefit the users, make a drawing similar to IL0290 (page 4) or the layout drawings in KI-1582 (*Interconnect Planning*, part of KI-1435). This drawing will help you analyze how the users will process calls and perform other functions. Such planning is critically important when the users are working with more than one control center.

Working with Multiple Control Centers

IL0290 shows four control centers that a key-phone user could be involved with: the key system itself, the Telecenter system, a PBX, and a central office (individual lines or Centrex service).

Each control center potentially offers new power but increases the complexity of the operations, because there are additional functions to learn; even when different control centers offer some of the same functions, like paging or transferring calls, each center usually has its own ways of doing them. This is why we have stressed the importance of careful planning in accordance with the interconnect manual, KI-1582. What we add here are a few specialized considerations for EKSU installations.

IL0290, on page 4, shows some representative ways in which key lines can be utilized; *it is not intended to represent a practical overall installation.* Lines 1 through 3 are connected directly to the Telecenter system; to access the functions of the PBX, these users would have to first dial out of the Telecenter system; they would also have to make use of the Telecenter system's remote hook-flash function in any PBX operation requiring a hook-flash. Note that the same key line could have several different numbers: a two-digit one that can be used by other key phones, a three- or four-digit number that can be used by administrative phones in the Telecenter sys-

tem, yet another number in the PBX, and perhaps a regular seven-digit number by outside callers using the central-office exchange. Users of these lines could access all the functions of the EKSU, the Telecenter system, and the PBX.

Connecting some lines directly to the PBX or central office enables the users to select a line that accesses the system they want to work in at that time. Line 4 or 5 could be used for a PBX function independently from the Telecenter system. This arrangement simplifies some operations, such as hook-flashing to the PBX or central office, but having a mixture of Telecenter and non-Telecenter lines confronts the users with different ways of doing the same function, depending upon which line they use. Specialized lines may also limit what the users can do. For example, if Lines 4-6 are connected directly to central-office trunks (without Centrex service), the users can get outside dial tone simply by selecting one of those keys; however, calls on these lines could not be transferred to the Telecenter system.

If the users will be transferring calls between control centers, use your diagram to trace the path of a call, so that you can see what the users have to do and what may happen when there is a problem. For example, if a call on Line 1 was transferred to ring a phone in the PBX system but there is no answer or a busy signal, how will this caller be returned to the key-phone attendant? (Answer: use remote hook-flash.)

Training

One of the best ways of assuring customer satisfaction with a system is to provide good training. Those charged with more complex operations, such as transferring calls and performing system functions, merit special attention in this area. It is imperative that they not be overwhelmed with information at first, for their confusion may hinder their learning, and their likely reaction will be to complain about the system. Two rules of thumb may prove helpful:

1. Don't train a person in functions they will not use.
2. When there are many functions or several ways of doing them, don't try teaching them all at once. Instead, start with the most-used functions and methods, then give the users time to use them on the job before continuing their training.

Two-Line Telephones

Refer as necessary to IL0293 (page 5) while you read the rest of this section.

A Second Line:

- Enables a Telecenter user to place one call on hold and take a second call. Users with only a single line can hook-flash and call someone else, but they cannot be called by anyone else until the first call has ended.
- May give the user a private, non-transferrable line for outside calls in addition to a Telecenter line.
- Maintain privacy for DIL calls by directing an overflow call to the second key. Without this second line, the caller would either **(a)** go unanswered or **(b)** be transferred to an attendant or another administrative phone.
- Two lines can be shared by two users to handle incoming and outgoing calls. Even when call-answering is not a major consideration, shared lines can be an economical way of giving users the flexibility afforded by two lines.
- Can be used for paging and other Telecenter functions while a caller is on hold, and the person who is paged can call back on the second line.

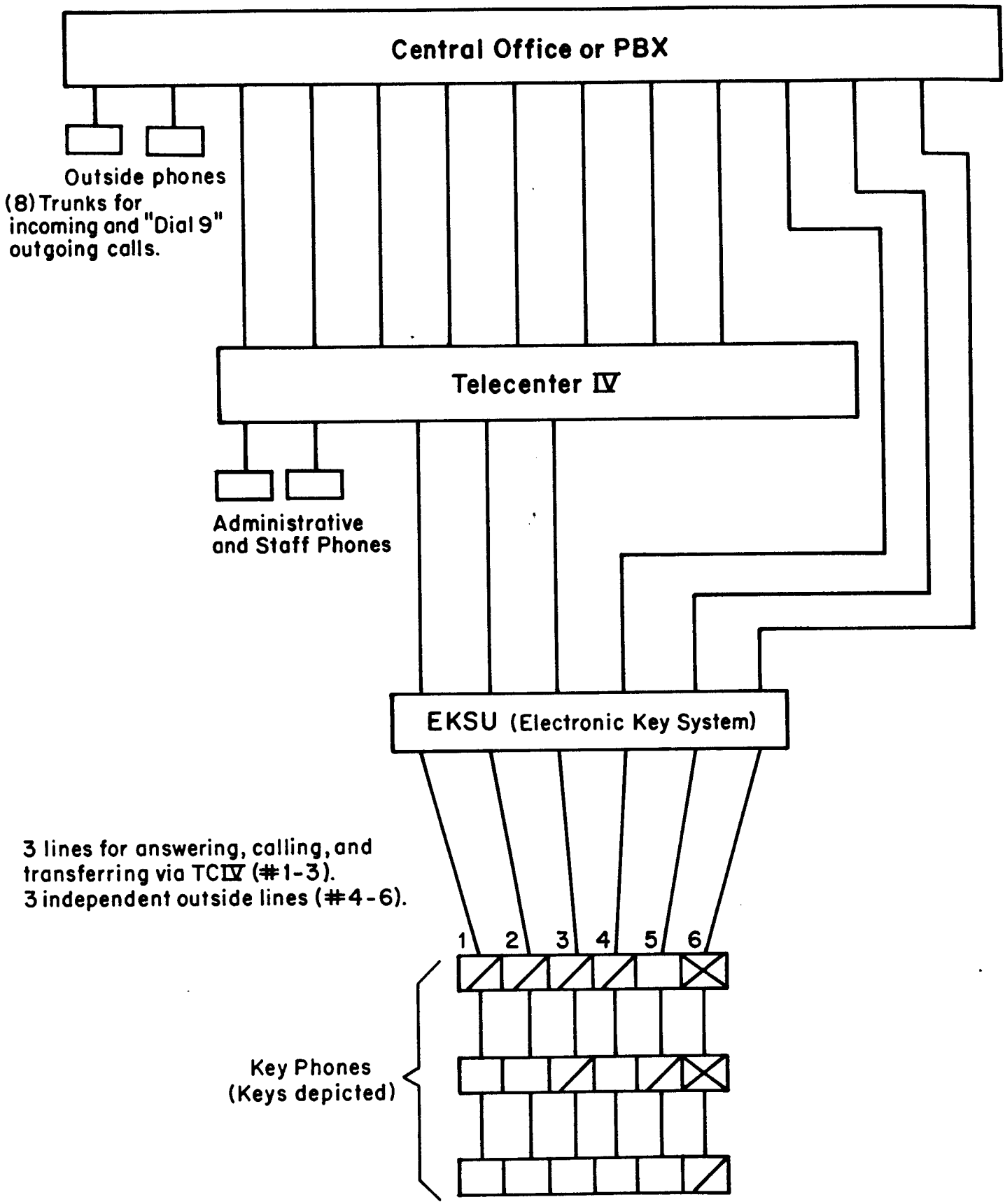
Headset

A headset may be used with the TC4400 Console. The *SW* model from ACS Communications, Inc., works with the ACS *MM* Control Unit, which must be ordered separately. The headset has a single earpiece, and the Control unit has a "listen" volume control.

Plug the Control Unit in place of the TC4400's handset, then plug both the headset and the handset into the Control Unit. The operator can then select the handset or the headset with a switch on the Control Unit.

Important: The DIP switches inside the Control Unit control the talk and listen levels for the headset. Follow the ACS manual when setting them. The handset is not affected by either the DIP switches or the volume control. Remember to order both items, and be sure to specify their color (we found that black matched the Console best):

SW (black) Ultralight Headset
MM (black) Control Unit



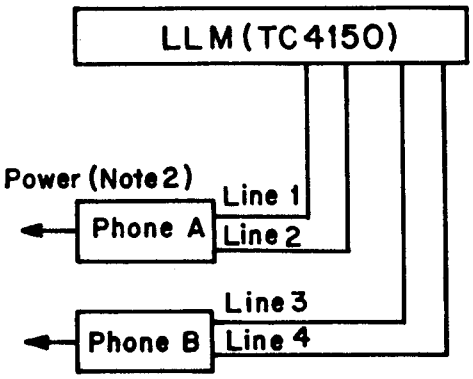
Phone rung by calls on that line

Line not accessible by that phone

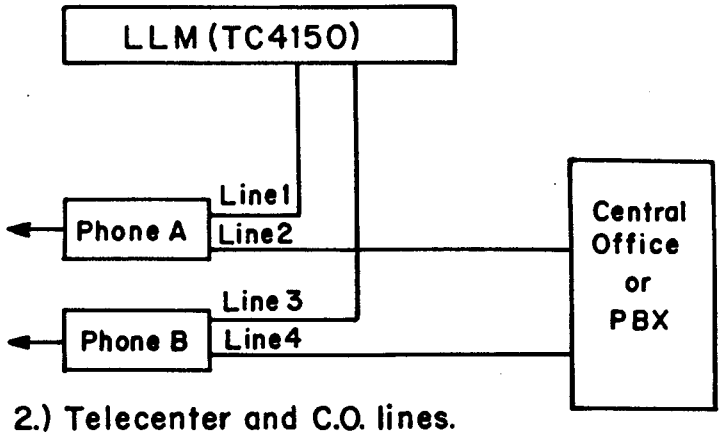
EKSU with Telecenter® IV and Direct Outside Lines

IL0290 O

Separate Lines

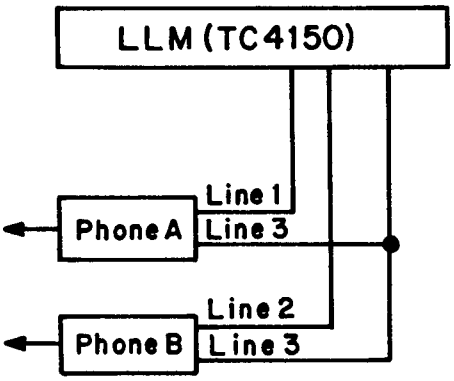


1.) Four Telecenter lines.

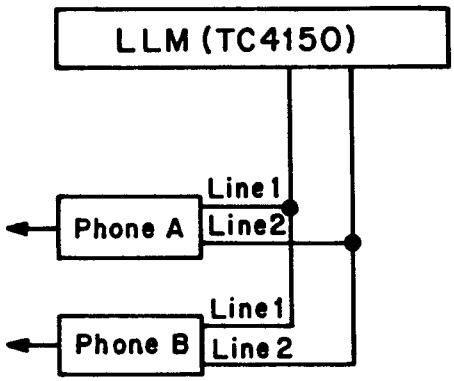


2.) Telecenter and C.O. lines.

Shared Lines



3.) One line shared.



4.) Both lines shared.

Notes:

1. Each "Line" in the diagram represents a twisted pair connected to a set of "T" and "R" terminals. The "T" ("tip") lead is usually green, and the "R" ("ring") lead is usually red. Some phones use different colors for the second line—see the phone manual.
2. Most two-line phones use a small, local power supply that requires a 120-VAC outlet.

TIE/communications, Inc., *Mod Key 16* EKSU.

General Description

In our tests, this small electronic key system worked well with the Telecenter system. It can accommodate up to six outside lines and 16 key phones.

Special Features

Some of the *Mod 16's* special features are:

- *Privacy:* the system's software can be set so that once a key phone has established communication on a line, no other key phone can break in.
- *Speaker and Monitor Phones:* Speaker phones have a microphone to allow hands-free two-way conversations; monitor phones lack a microphone, so the user can listen via the speaker but can talk only via the handset. Either of these phones offers these convenient capabilities:
  - √ A fast way of announcing incoming calls: Call another key phone and immediately inform that party, via his or her phone's speaker, of the call. If that party is busy on another line, you can "beep" the speaker to announce the waiting call.
  - √ Free your hands while you are waiting for someone on an outside line to get back to you: Simply push a button, hang up the handset, and listen via your speaker for the other person to begin talking again.
- *Hold Reminder:* After a call has been left on hold for a period of time (programmable), the phone will be rung again.
- *Exclusive Hold:* Pressing the *Hold* key twice in a row prevents any other station from picking up on your held call.
- *Speed Dialing:* Up to 20 numbers can be shared by all of the key phones, and each phone can have up to 10 additional numbers for private use.
- *Last-Number Redial.*
- *Night Answer:* The system can be easily switched between the normal mode, in which calls on each line may ring only one or a limited number of lines, to the off-hours (typically night-time) mode, when one or more key phones can be designated to be rung whenever a call comes over any line.

Planning Tips

It is very easy to install this EKSU with a Telecenter IV system, provided that you understand the application and have selected and configured the equipment to match it. Here are some tips to keep in mind while you are planning:

1. A Key Service Unit is required to drive the key phones. The basic unit will accommodate up to two lines and eight key phones. It includes a power supply.

2. Expansion: **(1)** If more than eight key phones are required, install a Station Expansion Unit to double the key system's capacity to 16 phones (see the next subsection, "Limitations"). **(2)** If more than two lines are needed, install a Four-Line Expansion Unit to increase the key system's line capacity to six lines.

Important: For each line connected to the Telecenter, you must provide an LLM (TC4150) line with a Ring-Trip Adapter (TC4153).

3. Choose only the TIE key phones that are designated for the *MOD 16* system. Other TIE phones, even those that look similar, are generally not compatible with this system.

4. Determine the amount and types of cables and modular receptacles required. Also consider whatever additional equipment is needed to provide such optional key-system features as music on hold and power-failure or circuit-protection devices.

Limitations

The following limitations should be kept in mind during your selection and planning of a key system:

- Within the *Mod 16,* any phone can call any other phone. However, since no more than six lines can come into the key system, no more than six key phones can be called individually by an outside phone (Telecenter, PBX, or central-office). This problem may not be important in a system where all administrative phones are in the key system.
- Calling within the key system is also restricted, because it has only two links. When they both are in use, other key phones cannot communicate with each other unless two outside (Telecenter, PBX, or central-office) lines are available.
- There is no way of displaying or printing out the programming of individual lines or stations. This emphasizes the need for keeping good records (programming sheets) of the programming, both the initial entries and any subsequent changes.
- This system cannot provide a double ring. Therefore, on lines coming from the Telecenter or a PBX, the operator has to talk to the caller to learn whether it is an inside or outside caller (some users like to know before answering, so they can give an appropriate greeting, like "Darby School," "Office," or "Phyllis").

Programming Tips

The *Mod 16* manual includes planning sheets for entering all programming changes to the default settings. Always use copies of these sheets, so that you can make new blank forms as needed. Work in pencil; once the programming has been performed and accepted, make copies for the user and your own records.

The *Mod 16* comes with a battery that enables it to hold programming information for at least a week during a power failure. Before entering all of the programming, enter just one or two items, then test the battery by turning off the system's power for at least a few minutes.

Enter the programming from the dial pad of Station 1 while its handset is on-hook; you will hear confirming beeps via the phone's speaker. The following list represents a minimum set of things to change from the default settings in a typical installation:

- *Line Access:* All of the key phones have six line keys with LEDs. However, a key can be completely disabled at a station, so that calls on that line will not ring at the station, the key's LED will not light, and the phone cannot use the line at all.
- *Ringing:* All key phones with access to a line will indicate a call by a flashing LED on the key. Audible ringing however, should be restricted to those phones that are normally intended to answer calls on that line.
- *Inter-Station Calls:* When one key phone calls another, the key system can either send a pre-announce "beep" and immediately connect the caller to the second phone's speaker ("Intercom" mode) or ring the second phone. The "Intercom" mode makes the call-announce procedure quicker and more convenient.
- *Privacy Release:* In the default setting, once any key phone establishes communication on a line, no other key phone can break in. Programming for Privacy Release would allow any key phone to enter an ongoing conversation by pressing the lighted key.
- *Toll Restrictions:* The *Mod 16* can restrict or prohibit outside calling on the entire key system. However, to allow key phones to access the Telecenter system, those lines can be programmed as "Behind a PBX," which would leave the toll restrictions in place for lines directly connected to a central-office trunk. The lines connected to the Telecenter system would have its toll restrictions.
- *Speed-Dialing Numbers:* These may be programmed with any telephone number, outside or inside, or with Telecenter functions. Although the speed-dialing function cannot sense dial tone, but it can include a pause or a hook-flash. Each key phone can establish 10 speed-dialing numbers for itself. You can also program 20 numbers that can be used by any phone in the system.

TIE/Communications, Inc., *Mod Key 32* EKSU.

General Description

In our tests, this medium-sized electronic key system worked well with the Telecenter® system. It can accommodate up to 12 lines and 32 key phones.

Special Features

Some of the *Mod 32's* special features are:

- *Privacy:* the system's software can be set so that once a key phone has established communication on a line, no other key phone can break in.
- *Speaker and Monitor Phones:* Speaker phones have a microphone to allow hands-free two-way conversations; monitor phones lack a microphone, so the user can listen via the speaker but can talk only via the handset. Either of these phones offers these convenient capabilities:
  - √ A fast way of announcing incoming calls: Call another key phone and immediately inform that party, via his or her phone's speaker, of the call. If that party is busy on another line, you can "beep" the speaker to announce the waiting call.
  - √ "Do Not Disturb": Users of Executive and 12-line key phones can press a *DND* button to block ringing from outside calls, "beeping" from intercom calls, and paging. The key LEDs would still flash to indicate calls, and the user could still answer and make calls.
  - √ Free your hands while you are waiting for someone on an outside line to get back to you: Simply push a button, hang up the handset, and listen via your speaker for the other person to begin talking again.
- *Hold Reminder:* After a call has been left on hold for a period of time (programmable), the phone will be rung again.
- *Exclusive Hold:* Pressing the *Hold* key twice in a row prevents any other station from picking up on your held call.
- *Speed Dialing:* Up to 20 numbers can be shared by all of the key phones, and each phone can have up to 10 additional numbers for private use.
- *Last-Number Redial.*
- *Night Answer:* The system can be easily switched between the normal mode, in which calls on each line may ring only one or a limited number of lines, to the off-hours (typically night-time) mode, when one or more key phones can be designated to be rung whenever a call comes over any line.
- *Power-Failure Operation:* Up to three stand-by phones can be connected to the key system. During a power failure, these phones become activated and provide direct access to central-office lines.
- *Call Recording:* A serial or parallel printer can be connected to make a record of incoming and outgoing calls.

Planning Tips

It is very easy to install this EKSU with a Telecenter IV system, provided that you understand the application and have selected and configured the equipment to match it. Here are some tips to keep in mind while you are planning:

1. A Key Service Unit is required to drive the key phones. The basic unit will accommodate up to 12 lines and 32 key phones; no expansion modules are needed. It includes a power supply.
2. *Important:* For each line connected to the Telecenter, you must provide an LLM (TC4150) line with a Ring-Trip Adapter (TC4153).
3. Choose only the TIE key phones that are designated for the *Mod 32* system. Other TIE phones, even those that look similar, are generally not compatible with this system.
4. Determine the amount and types of cables and modular receptacles required. Also consider whatever additional equipment is needed to provide such optional key-system features as music on hold, and power-failure or circuit-protection devices.

Limitations

The following limitations should be kept in mind during your selection and planning of a key system:

- There is no way of displaying or printing out the programming of individual lines or stations. This emphasizes the need for keeping good records (programming sheets) of the programming, both the initial entries and any subsequent changes.
- This system cannot provide a double ring. Therefore, on lines coming from the Telecenter or a PBX, the operator has to talk to the caller to learn whether it is an inside or outside caller (some users like to know before answering, so they can give an appropriate greeting, like "Darby School," "Office," or "Phyllis").

Programming Tips

The *Mod 32* manual includes planning sheets for entering all programming changes to the default settings. Always use copies of these sheets, so that you can make new blank forms as needed. Work in pencil; once the programming has been performed and accepted, make copies for the user and your own records.

The *Mod 32* comes with a battery that enables it to hold programming information for at least a week during a power failure. Before entering all of the programming, enter just one or two items, then test the battery by turning off the system's power for at least a few minutes.

Enter the programming from the dial pad of Station 1 while its handset is on-hook; you will hear confirming beeps via the phone's speaker. The following list represents a minimum set of things to change from the default settings in a typical installation:

- *Line Access:* The key phones can have six, ten, or twelve line keys with LEDs. However, a key can be completely disabled at a station, so that calls on that line will not ring at the station, the key's LED will not light, and the phone cannot use the line at all.
- *Ringing:* All key phones with access to a line will indicate a call by flashing the LED on the appropriate

key. Audible ringing however, should be restricted to those phones that are normally intended to answer calls on that line.

- *Inter-Station Calls:* When one key phone calls another, the key system can either send a pre-announce "beep" and immediately connect the caller to the second phone's speaker ("Intercom" mode) or ring the second phone. The "Intercom" mode makes the call-announce procedure quicker and more convenient.
- *Privacy Release:* In the default setting, once any key phone establishes communication on a line, no other key phone can break in. Programming for Privacy Release would allow any key phone to enter an ongoing conversation by pressing the lighted key.
- *Toll Restrictions:* The *Mod 32* can restrict or prohibit outside calling on the entire key system. However, to allow key phones to access the Telecenter system, those lines can be programmed as "Behind a PBX," which would leave the toll restrictions in place for lines directly connected to a central-office trunk. The lines connected to the Telecenter system would have its toll restrictions.
- *Speed-Dialing Numbers:* These may be programmed with any telephone number, outside or inside, or with Telecenter functions. Although the speed-dialing function cannot sense dial tone, it can include a pause or hook-flash. Each key phone can establish 10 speed-dialing numbers for itself. You can also program 89 numbers that can be used by any phone in the system.

Northern Telecom's *Unity* Two-Line Phone

General Description

This two-line phone tested well with the Telecenter IV system. When the phones are connected to the Telecenter system, no more than two phones should share a line.

The *Unity* two-line phone include these features:

- Each line has visual indicators for:
  - √ Ringing.
  - √ Off-hook.
  - √ Hold.
  - √ Do not Disturb: Indicates when the user has activated this feature, which turns off the ringer so that incoming calls are announced only by a flashing LED on the appropriate key.
- Monitoring-speaker operation with adjustable volume.
- Up to 16 speed-dialing numbers per phone.
- Hook-flash key ("tap" button).
- Last-number redial.
- Line-release key: Allows the user to end one call and dial another without hanging up.
- Adjustable Ringer: Both its volume and its frequency can be altered.
- Memory backup for up to 72 hours without AC power.

Planning Tips

The Telecenter TC4154 36-Volt Adapter is required. The *Unity* two-line telephone comes with a power supply that must be plugged into a nearby 120-volt AC socket.

Caution: Northern Telecom also makes a basic single-line phone called the *Unity II*. To make sure that you get the right phone, specify the *Unity* **two-line** phone and include its part number (8602-FWE-48-35-S).

Limitation

When two *Unity* phones share a line, there is no line privacy. Either phone can ignore the LED and barge in on a conversation.

Pac-Tel Two-Line Phone

General Description

The Pac-Tel two-line phone (p/n FE5300) has been tested and found to work well with the Telecenter IV system. The phones require a 36-volt adapter (TC4154) and four AA batteries. Some of this phone's features are:

- Two-line operation with visual indicators on each line for:
  - √ Ringing.
  - √ Off-hook.
  - √ Hold.
  - √ Conference.
- Hands-free speakerphone operation with adjustable volume.
- Twenty speed-dialing keys.
- Hook-flash key.
- Intelligent auto redial: will automatically engage the speakerphone, redial a number, ring it for 20 seconds, hang up, wait 45 seconds, then repeat this process until the number answers.
- Remote release of hold.
- "High," "Low," and "Off" positions for Line-1 and Line-2 ringers.

Cautions and Limitations

If the speakerphone audio is weak or erratic, it may be necessary to use a 12-VDC adapter.

This phone requires four AA batteries for **(a)** the proper operation of the line-status LEDs and the redial button, and **(b)** memory back-up for the speed-dial buttons.

When two Pac-Tel phones share a line, there is no line privacy. The user of the other phone can ignore the LED and barge in on a conversation.