TECHNICAL
Practice
TELECOM SOLUTIONS FOR THE 21ST CENTURY

RAD-1
Remote Access Device

August 20, 2002

VIKING

Line Powered Remote Access Device

The **RAD-1**, remote access device, gives authorized users remote access to PABX, Centrex and Electronic Key system features. It can also provide bridging to a second central office line. With two levels of access and programmable toll restriction, the **RAD-1** provides the security required to help prevent phone system and toll abuse.

The **RAD-1** answers on the first ring and disconnects on CPC, time out or by dialing #7. The 600 ohm **LINE OUT** port provides loop closure for audio access to system features or an external device. For "line extender" applications, the user does not have to hang up and redial the **RAD-1** to make another call. The **RAD-1** will also provide a hookswitch flash on the **LINE OUT** port to access PABX, Centrex or Electronic Key system features.

⚠ *This product does not eliminate the possibility of toll fraud! To further protect against fraudulent calls, use with a TR-1 Toll Restrictor (Fax Back Document 705).*

Features

- Programmable 6 digit security code
- Two programmable levels of access
- Programmable toll restriction
- Allows 1-800, 1-888 and 911 calls
- Disconnects on CPC, call time out, toll restriction, or by dialing #7
- Programmable 5 second to 50 minute call timer
- Provides a 500ms hookswitch flash to access features on PABX, Centrex, C.O. lines
- Provides a 2 second disconnect for new calls
- Bridges any loop start/ground start line or analog PABX station to a 600 ohm audio input
- Auxiliary contacts available for systems that need a dry contact closure
- Non-volatile memory (no batteries required)

http://www.vikingelectronics.com

Applications

Remote Access To:

- Paging systems (Viking's **CPA-7B** or **PA-2A**)
- Service observers (Viking's **SO-24A**)
- PABX, Centrex or Key System features (DISA with security)
- Voice mail, dictation equipment or modems
- WATS, FX or TIE lines (through a PABX or as a line extender)
- Advertisements, radio or church programs
- Audio monitoring for security purposes
- Other calling zones (line extender)

Phone…715.386.8861

info@vikingelectronics.com

Specifications

Power: Telephone Line Powered (24V DC 20mA minimum)
Dimensions: 133mm x 89mm x 44mm (5.25" x 3.5" x 1.75")
Shipping Weight: 1.13 kg (2.5 lbs)
Environmental: 0°C to 32°C (32°F to 90°F) with 5% to 95% noncondensing humidity
Relay Cotact Ratings: 220V AC/DC @ 1 Amp resistive
Audio Loss (through unit): 1 dB
Connections: (2) RJ11 modular jacks, five position screw terminal strip
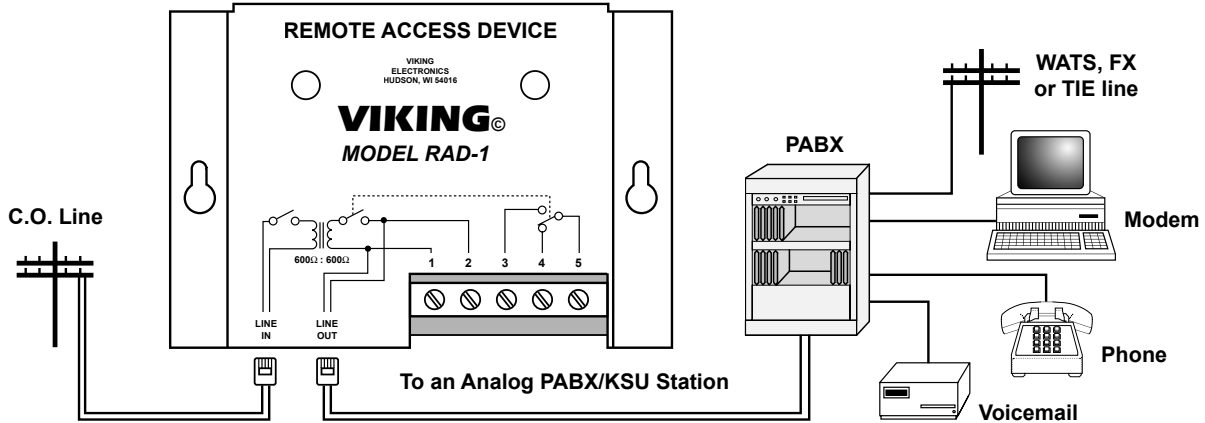
Installation

Connect your local incoming line to the modular jack labeled **LINE IN** and connect the modular jack labeled **LINE OUT** to an unused analog station, telephone line, or 600 ohm audio device. Some typical applications are shown in the following sections **A - E**.

A. Access PABX Features (DISA)

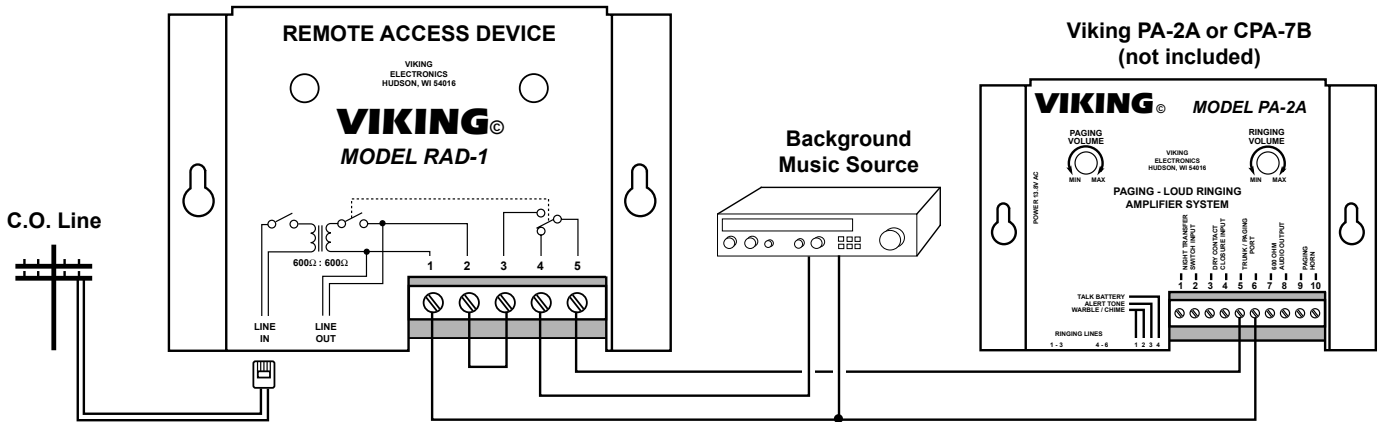The **RAD-1** can be used to access your phone system remotely. *Note: For two-way voice applications a decibel loss-may occur. In this case, the **RAD-AMP** is recommended.*

? Need More Information on the RAD-AMP?
Call (715) 386-4345 and select 415.

B. Access One Way Paging Systems

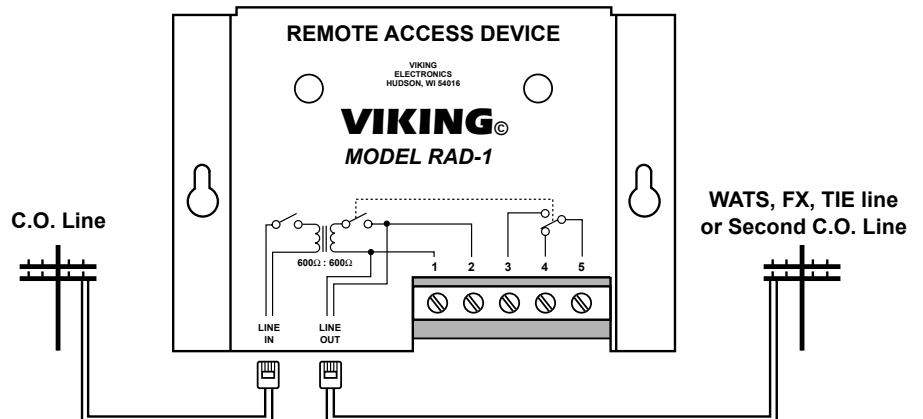The **RAD-1** can be used to access paging systems remotely.

? Need More Information on the CPA-7B?
Call (715) 386-4345 and select 455.

? Need More Information on the PA-2A?
Call (715) 386-4345 and select 485.

C. Line Extender

The **RAD-1** can be used to access another line remotely. *Note: For two-way voice applications a decibel loss may occur. In this case, the **RAD-AMP** is recommended.*
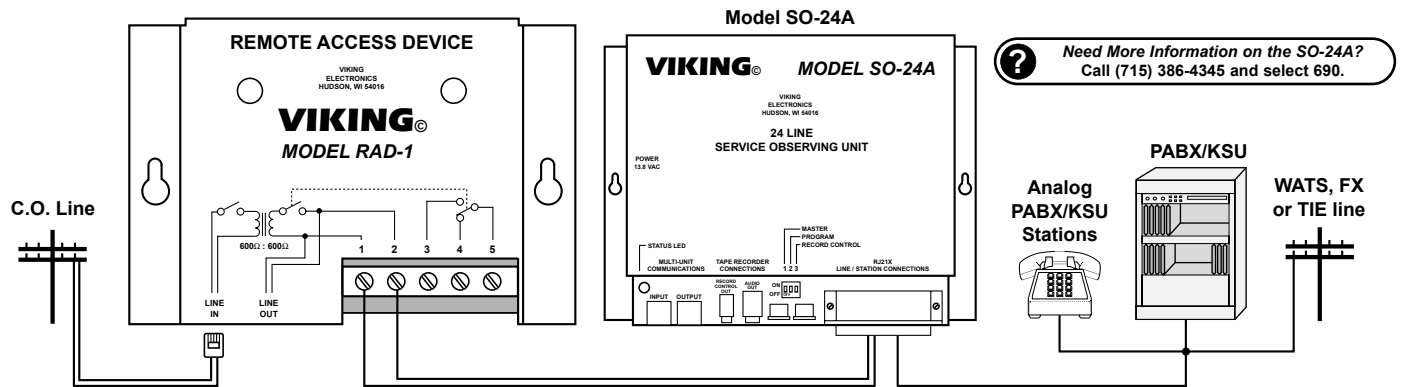
? Need More Information on the RAD-AMP?
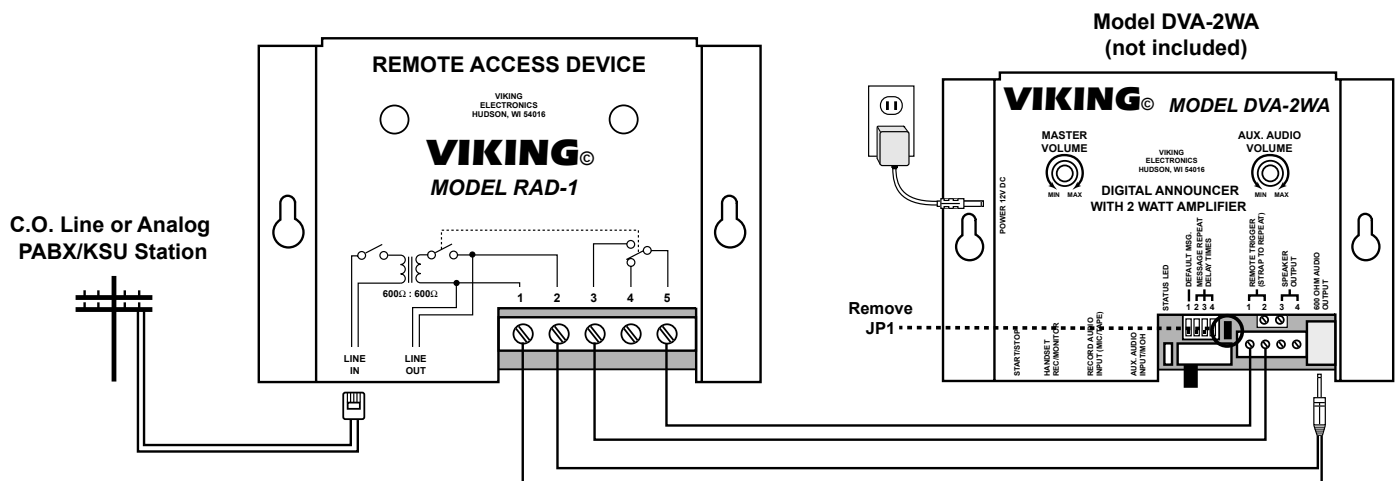**Call (715) 386-4345 and select 415.**

D. Remote Service Observation

The **RAD-1** can be used to access the **SO-24A** Service Observing unit. *Note: For two-way voice applications a decibel loss may occur. In this case, the **RAD-AMP** is recommended.*

? *Need More Information on the RAD-AMP?*
Call (715) 386-4345 and select 415.

E. Single Line 7.5 Minute Digital Announcer

In this application, the **RAD-1** will answer the line and trigger the message on the **DVA-2WA** to play from the beginning. The **RAD-1** Call Timer must be programmed to a time long enough for the **DVA-2WA** to play its entire message (see **Programming** section **B**).

*Note: For this application, **JP1** on the **DVA-2WA** must be removed. Installation and programming specifications for the **DVA-2WA** are available in the **DVA-2WA** Technical Practice, **Fax Back Document 110**.*

? *Need More Information on the DVA-2WA?*
Call (715) 386-4345 and select 110.

Programming

A. Security Code

The security code allows the user/installer to program the **RAD-1**. The factory preset security code is **845464** (V-I-K-I-N-G). To program your personal security code follow the directions below.

Step 1.	Call into the **RAD-1**.
Step 2.	Dial ✱ followed by **845464** (a double beep should be heard).
Step 3.	Enter your new 6 digit security code followed by **#47** (a double beep should be heard).

Important: It is recommended that the factory set security code be changed. This number should be written down and stored in a safe place.

*Note: While programming, if no Touch Tones are entered for 20 seconds, the **RAD-1** will disconnect.*

B. Programming and Remote Access Features (requires a Touch Tone phone)

If a valid Touch Tone sequence is entered while programming, a double beep will be heard. Three beeps indicate an error. To begin programming, call the **RAD-1**. When the device answers, you have 20 seconds to enter ✶ followed by your 6 digit security code (a double beep should be heard). The **RAD-1** may now be programmed.

Note: While programming, if no Touch Tones are entered for 20 seconds, the RAD-1 will disconnect.

Quick Programming Features	Enter Digits	- then -	Enter Memory Location
Security code (6 digits, 0-9) (factory set to 845464)	**6 digits**	then	**#47**
Outside line access (used with priority 2 and toll restriction) (factory disabled)	**1 digit**	then	**#44**
Priority 1 Access Code (6 digits, no digits diables) (factory disabled)	**6 digits**	then	**#45**
Priority 2 Access Code (6 digits, no digits diables) (factory disabled)	**6 digits**	then	**#46**
Call timer (00 for 5 seconds, 01-99 for .5 to 49.5 minutes) (factory disabled)	**2 digits**	then	**#48**

Note: To disable or eliminate the use of any of the above features, enter the #
+ location number (44, 45, 46, or 48) without any preceding numbers.

To restrict 1-900, 976, 1-976, 1-xxx-976 (factory setting)	✶ **1**
To allow 1-900, 976, 1-976, 1-xxx-976	✶ **2**
To restrict 1 + Long Distance, 1-0 (1-800, 1-888 always allowed) (factory setting)	✶ **3**
To allow 1 + Long Distance, 1-0	✶ **4**
To restrict 0 + Dialing (factory setting)	✶ **5**
To allow 0 + Dialing	✶ **6**
To restrict 555, 1-555, 1-xxx-555, 411, 1-411 (factory setting)	✶ **7**
To allow 555, 1-555, 1-xxx-555, 411, 1-411	✶ **8**
Answer alert tones on (factory setting)	✶ **9**
Answer alert tones off	✶ **0**
SO-24A mode enable	✶ ✶
SO-24A mode disable (factory setting)	✶ **#**
Exit Programming and disconnect	**# 7**
Set all programming features to factory settings	**###**

Operating Features	Enter Digits
500ms hookswitch flash on LINE OUT port	**# 1**
2 second momentary disconnect on LINE OUT port	**# 2**
Hang up LINE IN and LINE OUT port	**# 7**

C. Programming Examples

1. For Accessing PABX Features (DISA) (Section A)

Programming the RAD-1 to...	Enter Digits
1. ...set the outside line access for this PABX to 9	**9 #44**
2. ...set the "Priority 1" access code to 123456	**123456 #45**
3. ...set the "Priority 2" access code to 234567	**234567 #46**
4. ...disable the call timer	**#48**

2. For Accessing One Way Paging Systems (Section B)

Programming the RAD-1 to...	Enter Digits
1. ...disable outside line access	**#44**
2. ...disable the "Priority 1" access code	**#45**
3. ...disable the "Priority 2" access code	**#46**
4. ...set call timer to 1 minute	**02 #48**

3. For Line Extender (Section C)

Programming the RAD-1 to...	Enter Digits
1. ...disable outside line access number	**#44**
2. ...set the "Priority 1" access code to 345678	**345678 #45**
3. ...disable the "Priority 2" access code	**#46**
4. ...set the call timer to 20 minutes	**40 #48**
5. ...restrict 1-900, 976, 1-976 and 1-XXX-976	✶**1**

4. Remote Service Observation (Section D)

Programming the RAD-1 to...	Enter Digits
1. ...disable outside line access	**#44**
2. ...set the "Priority 1" access code to 456789	**456789 #45**
3. ...disable the "Priority 2" access code	**#46**
4. ...enable **SO-24A** mode	******

Operation

The **RAD-1** allows remote access to loop start C.O. lines, analog PABX stations or any other 600 ohm audio device. This can be very useful for many applications including using a local line to access an inexpensive WATS line (line extending), utilizing your PABX/KSU features (DISA), service observing with Viking's **SO-24A**, or remote access to paging systems.

*Important: It is crucial that the installer and system owner understands the functions and capabilities of both the **RAD-1** and the lines and/or PABX stations connected to the **RAD-1**, so that any and all toll fraud and other system abuse possibilities are understood. This enables the installer and owner to make risk managing decisions about the system in which the **RAD-1** is put into. Viking Electronics Inc. is not able to assume responsibility since it is a function of the entire system assembled by the installer/owner. A Viking **TR-1** Toll Restrictor may be added to help prevent toll abuse if the PABX and **RAD-1** toll restriction is not adequate.*

A. Access

The **RAD-1** will answer an incoming call on the first ring. The **RAD-1** offers either unsecured access, or two levels of secured access, designated "Priority 1" and "Priority 2." "Priority 1" access may be used in applications where the **RAD-1**'s outbound line is either a CO line or a PABX extension, whereas the "Priority 2" access mode is specific to applications where the **RAD-1**'s outbound line is a PABX extension.

Note: The "Priority 1" and "Priority 2" access codes can work well together. As an example, one group of users can be given the "Priority 2" access code, and hence only have the ability to dial within the PABX system. Another group of trusted users (supervisors, for example) could be given the "Priority 1" access code, and thus have unrestricted remote access to the PABX system, including outbound dialing.

1. Unsecured Access

If neither the "Priority 1", nor the "Priority 2" access codes have been programmed, the unit is "Unsecured." In this mode, the **RAD-1** answers the inbound call, double beeps, bridges the lines together, and the caller is given full and immediate access to the outbound line. The caller may then dial un-restricted phone numbers. Anybody that calls into the **RAD-1** is given an extended line.

2. Priority 1 (unlimited) Access

When a "Priority 1" access code has been programmed, the **RAD-1** answers the inbound call and prompts the caller with a single beep. The caller is then required to enter a 6 digit access code. If the proper access code is not entered within 20 seconds, the **RAD-1** will triple beep and hang up. When a valid access code has been entered, the **RAD-1** will double beep and bridge the lines together providing access to the opposite line port. Anybody that calls into the **RAD-1** and successfully dials the "Priority 1" access code has unlimited access to the extended line, and may dial un-restricted phone numbers.

3. Priority 2 (limited) Access

This mode is specific to PABX applications. When a "Priority 2" access code has been programmed, the **RAD-1** answers the inbound call and prompts the caller with a single beep. The caller is then required to enter a 6 digit access code. If the proper access code is not entered within 20 seconds, the **RAD-1** will triple beep and hang up. When a valid "Priority 2" access code has been entered, the **RAD-1** will double beep and bridge the lines together providing access to the opposite line port. The caller is then given limited access, and may only dial extensions and features within the PABX. If the caller attempts to dial the PABX outside line number (programmable, but typically a 9) to place a call outside of the PABX, the caller will hear a triple beep and be immediately disconnected. This effectively prevents toll fraud and system abuse. *Important: If the PABX utilizes any special direct trunk access codes in addition to the outside line number, the **RAD-1** can not prevent toll fraud and system abuse on a "Priority 2" access call.*

When the **LINE OUT** relay has been actuated, several other commands can be used. For a 500ms hookswitch flash on the **LINE OUT** port, dial **#1**. To create a 2 second disconnect on the **LINE OUT** port for making a new call, dial **#2**. To disconnect the **RAD-1**, dial **#7**. The **RAD-1** will also disconnect when a CPC break occurs on the **LINE IN** port or after the call timer has expired. When disconnecting, both **LINE IN** and **LINE OUT** relays are opened.

The **SO-24A** mode is useful when using the **RAD-1** with other devices that use Touch Tone commands in their operation, such as the Viking's **SO-24A**. In this mode, the **RAD-1** will only accept the **#7** hang-up command. All toll restriction functions are disabled.

> **?** *Need More Information on the SO-24A?*
> *Call (715) 386-4345 and select 690.*

*Note: For applications where an audio decibel loss is a problem, the **RAD-AMP** is suggested.*

Other Products

DVA-2WA Digital Voice Announcer with Amplifier

The **DVA-2WA** is a digital announcer with a built in 2 watt amplifier. Designed to provide music and promotion on hold, the **DVA-2WA** can playback in a continuous loop or alternate between promotions and an auxiliary music source in timed intervals. Any number of multiple messages may be recorded. The announcer comes with four professionally pre-recorded promotion on hold messages, a power supply and cabling for an easy plug and play installation.

The output of the **DVA-2WA** may also be connected directly to loudspeakers for repeated messages or played at the push of a button for museum displays, information booths, point of interest locations, retail applications, etc.

The **DVA-2WA**'s non-volatile memory eliminates the need for batteries or costly built in tape decks. This provides the convenience of recording at the shop or professional studio and then shipping to the installation site.

> **?** *Need More Information on the DVA-2WA?*
> *Call (715) 386-4345 and select 110.*

PA-2A Paging/Loud Ringing Amplifier System

The **PA-2A** provides loud ringing and paging to electronic key systems, 1A2 Key systems, PABX's as well as No-KSU phones and multiline phones.

Paging is accomplished by connecting the **PA-2A** to a paging port or unused C.O. line input of nearly any phone system. The **PA-2A** will also generate an adjustable loud warble from up to 6 C.O. lines or from a dry contact closure. An external "night transfer" switch can be added to turn loud ringing on or off in night bell applications.

The **PA-2A** is easy to install and eliminates the installation of multiple bells, relays and paging cards. The unit comes complete with a power supply, amplifier and (1) paging horn.

> **?** *Need More Information on the PA-2A?*
> *Call (715) 386-4345 and select 485.*

SO-24A Service Observation Unit

The **SO-24A** allows supervisors to silently monitor employee phones without disrupting the activity at their workstation. The information gathered may be used for quality purposes, to train, motivate even assist customer service and telemarketing representatives.

A supervisor may enter the conversation by dialing a "✱." A cassette recorder output permits automatic or manual recording of conversations.

The **SO-24A** features improved audio and can now be easily expanded to 240 stations by installing additional **SO-24A**'s. The **SO-24A** can be programmed with a 2, 3 or 4 digit dial up code to match station extension numbers.

> **?** *Need More Information on the SO-24A?*
> *Call (715) 386-4345 and select 690.*

Product Support Line…715.386.8666   *Fax Back Line…715.386.4345*