

Baseband

3

Components

The following table lists the required and optional components used in a baseband system. Some of these components may be fabricated.

Table 6.

Required	Optional
RANCAGE Card Cage	RANMENU Character Generator (recommended)
RANxxVSyy (or equivalent switcher)	RANAVJ Audio and Video Jack
RANAVMS2 Audio/Video Multiplexer Module	RANEXPAD Master Port Expander (if have RANEXP and need more than 12 ports)
RANAVDS2 Audio/Video Demultiplexer Module	RANBROAD Master Port Expander
RANSYNCR Sync Generator	RANDTMF Interface Board (for control via phone)
In a fiber system: RANFT4/RANFT4FM or RANFT1/RANFT1FM Transmitter Cards	RANRELAYS8 or RANRELAY14 Universal Relay Card (required if devices are relay controlled)
RANCC16 Control Card Cage	RANIRIS Infrared Capture Unit (for custom IR codes)
RANCPU Control System Master Card or RANEXP Master Port Expander	RANCLASS1 Classroom Control Panel
RANIR and/or RAN232 (Control Cards)	TV Interface Boxes: RANCLINTF for coax systems or RANFBINT for fiber systems
RANCL101 or RANCL101CP Classroom Controller	RANDATA Level III Laser Disc Controller
Television Monitors	RANAVMS1 Audio/Video Multiplexer Module (for distributed local origination)
Resources (RANLASER, RANVCR, etc.)	RANPCVID Super Video Windows Card
RANPS12 Power Supply	RANHHELD Remote Control

Rauland RANGER® System Planning

Required	Optional
Method of Control (Telephone, PC or Mac on LAN, Remote Control, Wall Panel)	RANLPSW (Lesson Plan SW)
RANSHELF Rack Mount Kit	MRR7700 and MRR7800 (DTMF remote receiver to add mobility to a DTMF system)
	RANRF

Installation

Communication Company of South Bend. Rolling Prarie Elementary, S.O. C428634 RAN-024 v1.0				
Rack Layout: (3) 61 Racks				
Rack Unit	Rack 1	Rack 2	Rack 3	
1	VCR1	VCR6	MCX300	Notes: 1. Racks 1 and 2 are bolted together. 2. Customer to supply PC (XT or higher with 1 serial port and DOS 3.0 or higher) for RANMENU.RANSHELF provided for mounting as shown. 3. Rack 3 Customer will install MCX300 & TCV.
2	w/ RANSHELF	w/ RANSHELF	LASER1	
3		(Tuner Only)	w/ RANSHELF	
4	VCR2	VCR7	LASER 2	
5	w/ RANSHELF	w/ RANSHELF	w/ RANSHELF	
6		(Tuner Only)	LASER 3	
7	VCR3	VCR8	w/ RANSHELF	
8	w/ RANSHELF	w/ RANSHELF	LASER 4	
9		(Tuner Only)	w/ RANSHELF	
10	RANMON13 w/ RANMONMNT	PC MONITOR w/ RANMONMNT	LASER 5	
11			w/ RANSHELF	
12				
13				
14				
15				
16			TCV	
17				
18	VCR4	BP1		
19	w/ RANSHELF	KEYBOARD		
20		w/ RANKEYMNT		
21	VCR5	VFLOP1		
22	w/ RANSHELF	w/ RANSHELF		
23			BP4	
24	RAN50X20	RANPCSW		
25		w/ RANSHELF		
26			BP4	
27		RANMENU		
28		w/ RANSHELF		
29			Leave open for customer Amp.	
30	RAN50VS20	RANCC16		
31				
32				
33				
34				
35		RANCAGE		

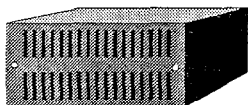
Figure 7. Typical Baseband Rack Layout Diagram

Pre-Installation Information

RANCL101 and RANCL101CP Classroom Controllers

- You will need to pull one video cable or one fiber-optic cable to each location that will receive video from the headend. If a classroom has distributed local origination, an additional coax or fiber video cable will be required, as well as additional hardware (RANAVMS1 and RANFT1 for fiber). If using RS485 control in the classroom, an additional 1-pair shielded data-grade wire will also need to be pulled. For more information refer to the Installation manual, KI-1856.
- If a RANCLINTF classroom cable interface plate is used in a coax-based system, the 2-gang box that will hold the RANCLINTF must be mounted within five feet of the RANCL101 or RANCL101CP Classroom Controller.
- For fiber systems, an 8 × 10 × 4 backbox (RANBOX4) is required to hold the RANFBINT TV Interface Box. It should be mounted within 5 feet of the RANCL101 or RANCL101CP.
- The 1-pair shielded wire can be looped from one classroom to another as long as it does not exceed the maximum distance per AXLINK port specified in the documentation for the RANEXP Master Port Expander, RANEXPAD Master Port Expander, RANBROAD Master Port Expander, or RANCPU Control System Master Card. The control pair can also run on independent AXLINKS. Each link is subject to the specifications for maximum distance per AXLINK port specified.
- If using a RANAVJ Audio and Video Jack, a single-gang electrical box must be mounted so that it is easily accessible for the local device (e.g., camera) that will be plugged in. Install an RG59 (or equivalent) cable and one shielded-pair to the RANCLINTF TV Interface Box.
- If using a RANDATA for Level III laser disc control, a single-gang electrical box must be mounted so that it is near the computer running the Level III program. Install one shielded data-grade pair from the RANDATA to the RANCLINTF TV Interface Box.

Headend Video



RANCAGE Card Cage

The RANCAGE is a card cage that houses Fiber, Multiplexer, and Demultiplexer cards used with a RANGER system (RANAVMS2, RANAVDS2, RANFT4, or RANFR4). This cage holds any combination of ten cards regardless of the type of card. The RANCAGE requires 12 VDC at 20 mA and mounts in a four-rack unit (7") space.

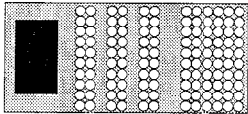
Parts Required

- 4 Mounting screws (RB Part # B0439) and 4 washers (RB Part # WL0315)

- 1 2-pin Phoenix connector (supplied with the RANCAGE)
- 1 Pair of twisted red and black 18 ga. wire for power

Associated Equipment

- 1 12 VDC power source (e.g., RANPS12)
- RANAVMS2, RANFT4, RANFR4, RANAVDS2



Note: The RAN[xx]VS[yy] is a modular unit. The xx and yy are variables that refer to the capacity of the switch. xx=inputs and yy=outputs.

RAN[xx]VS[yy] Video Matrix /Auto Patch Switchers

RAN[xx]VS[yy] and Auto Patch Switchers are video matrix switches designed to connect system inputs (typically media devices or locally originated broadcasts) to output locations (typically classrooms) in baseband RANGER systems. Connection between classrooms and the media center are controlled through the RANCPU Control System Master Card which interfaces to the Video Matrix Switch via an RS232 connection. The switch then connects to the source device or other audio/video inputs through a multiplexer module (RANAVMS2) permitting the use of a video-only switch. The RAN[xx]VS[yy] is available in increments of ten inputs and ten outputs. The Auto Patch Switcher is available in increments of four inputs and four outputs.

Parts Required

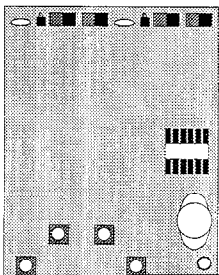
- 1 Interface cable (refer to drawing VW2374 for the RAN[xx]VS[yy] switch and VW2375 for the Autopatch switch)
- 1 Power cord (supplied with the switch)
- 1 RAN232 Serial Control Card (see “RAN232” for more information)

Associated Equipment

- 1 RANCC16 Control Card Cage (see “RANCC16” for more information)
- 8 Mounting screws (RB Part # B0439) and 8 washers (RB Part # WL0315) for RAN[xx]VS[yy]

RANAVMS2 Audio/Video Multiplexer Module

The RANAVMS2 is a stereo audio/video multiplexer module that combines a media resources' audio and video signals onto one 75Ω coax cable. This cable then connects to the video matrix switch, which then passes the signal over another 75Ω coax cable to the classroom. The RANAVMS2 consists of two multiplexer modules on one PC board allowing two resources to be connected to one RANAVMS2. These stereo audio/video



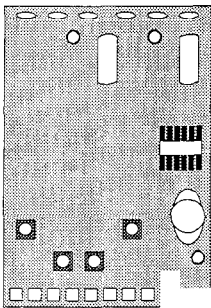
power source.

Parts Required

- 1 75Ω video cable with Phono to Phono connectors (refer to drawing VW2377) or Phono to BNC (refer to drawing VW2376) for RANVFLOP and RANSVHS
- 1 or 2 Phono to Phono audio cable (refer to drawing VW2385). Separate left and right leads for stereo sources. Mono audio sources will only need 1 cable.
- 1 75Ω video cable with Phono to BNC connectors for composite out to the video matrix switch input (refer to drawing VW2376)

Associated Equipment

- 1 RANCAGE Card Cage (see "RANCAGE" for more information)
- 1 RANPS12 Power Supply
- 1 Media device (e.g., RANVCR, RANCDI, RANLASER, RANVFLOP, or RANMENU)



RANA VDS2 Audio/Video Demultiplexer Module

The RANA VDS2 is a stereo Audio/Video Demultiplexer module that takes a combined Video Matrix Switch output signal and converts that signal back to separate audio and video signals. The RANA VDS2 consists of two demultiplexer modules on one PC board allowing two resources to be connected to one RANA VDS2. These stereo audio/video demultiplexer modules are housed in a RANCAGE Card Cage with a 12 VDC at 400 mA power source. They are usually used in conjunction with an operator console or preview monitor (e.g., RANMON13).

Parts Required

- 1 75Ω video cable with Phono to Phono connectors (refer to drawing VW2377) or Phono to BNC (refer to drawing VW2376) for RANVFLOP and RANSVHS
- 1 or 2 Phono to Phono audio cable (refer to drawing VW2385)
- 1 75Ω video cable with Phono to BNC connectors for composite out to the Video Matrix Switch output (refer to drawing VW2376)

Associated Equipment

- 1 RANCAGE Card Cage (see "RANCAGE" for more information.)
- 1 RANPS12 Power Supply
- 1 Output device (e.g., RANMON13 or RANPCVID).



RANSYNCR Sync Generator

The RANSYNCR is a black and white camera which produces a sync pulse that is needed to keep the RANGER system's video output in sync when no resource is assigned to a classroom monitor. It mounts on the side of one of the media center equipment racks and requires a 24 VAC power supply.

Parts Required

- 1 VP0266 (24VAC power supply)
- 2 BNC to Phono 75Ω video cables (refer to drawing VW2376)

Associated Equipment

- 1 3-conductor wire to interconnect the VP0266 to RANSYNCR

RANFT4/RANFT4FM or RANFT1/RANFT1FM Fiber Transmitter Card



These transmitter cards convert a coax signal to fiber. The RANFT4 is an AM Quad Fiber Transmitter Card that transfers a baseband audio/video signal from the video switcher over a fiber-optic cable to a classroom (the RANFT1 is a single module). In fiber optic based systems one RANFT4 is required for every four outputs (classrooms). While these modules are not required for baseband coax systems, it is possible to have some outputs that are fiber optic and some that are coaxial. The RANFT4FM and RANFT1FM are FM versions of the RANFT4 and RANFT1. Each transmitter mounts in the RANCAGE Card Cage, and requires 12 VDC at 280 mA.

Parts Required

- 1 RANCAGE Card Cage (to mount the RANFT4 or RANFT4FM)
- 1 RANFBINT TV Interface Box (to mount the RANFR1 or RANFR1FM)

Associated Equipment

- 1 Multimode Fiber-Optic cable
- 1 BNC to BNC 75Ω video cable (refer to drawing VW2375) for the RANFT4

RANFR4/RANFR4FM or RANFR1/RANFR1FM Fiber Receiver Card



These receiver cards convert a fiber signal back to coax. The RANFR4 is an AM Quad Fiber Receiver Card that receives a baseband audio/video signal from the video switcher over a fiber-optic cable to a classroom (the RANFR1 is a single module). In fiber-optic based systems one RANFR1 is required for each classroom that is receiving a fiber

signal. One RANFR4 is required for every four classrooms that have distributed local origination. While these modules are not required for baseband coax systems, it is possible to have some inputs that are fiber optic and some that are coaxial. The RANFR4FM and RANFR1FM are FM versions of the RANFR4 and RANFR1. Each receiver mounts in the RANCAGE Card Cage, and requires 12 VDC at 340 mA.

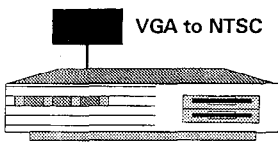
Parts Required

- 1 RANCAGE Card Cage (to mount the RANFR4 or RANFR4FM)
- 1 RANFBINT TV Interface Box (to mount the RANFT1 or RANFT1FM)

Associated Equipment

- 1 Multimode Fiber Optic cable
- 1 BNC to BNC 75 Ω video cable (refer to drawing VW2375) for the RANFR4

RANMENU Character Generator



RANMENU uses an IBM compatible PC to generate and display classroom TV menus for the RANGER system. A PC running RANMENU software interprets live serial data fed from a RAN232 Serial Control Card housed in the RANCC16 Control Card Cage. The data is formatted and sent to the computer VGA video output where it is then converted to a composite NTSC signal via a VGA/NTSC scan converter. The video output is then redirected through the method used for video distribution. The RANMENU is comprised of software, interface cable, and a VGA/NTSC converter. Rauland-Borg does not supply a computer. The RANMENU software requires an 8088 or better computer capable of displaying VGA color graphics. The computer requires a license for DOS 3.3 or better, a floppy drive and a RS232 port. No monitor, keyboard, or hard drive is required.

Parts Required

- 1 RANAVMS2 Audio/Video Multiplexer Module
- 1 Phono to Phono 75 Ω video cable (refer to drawing VW2385)
- 1 Phono to Phono 75 Ω video cable (refer to drawing VW2377)
- 1 Interface Serial Port cable (refer to drawing VW2353)

Associated Equipment

- 1 RAN232 Serial Control Card (see "RAN232" for more information)
- 1 RANCC16 Control Card Cage (see "RANCC16" for more information)

- 1 Terminal punch-block (Graybar SS66B3-75)
- 1 RANPS12 Power Supply
- 1 RANDATXCR (one per building)

RANEXPAD Master Port Expander

The RANEXPAD is a Master Port Expander that is used when you require additional ports beyond those available on a RANEXP (12+). You must have at least one RANEXP before you can add a RANEXPAD. Each RANEXPAD adds an additional set of twelve runs of cable (with a maximum of 60,000 pf). It requires 12 VDC at 200 mA and is mounted in a one rack unit (1.75") space. The RANEXPAD must be mounted in the same rack as the RANEXP.

Parts Required

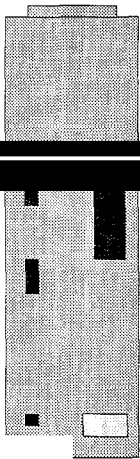
- 1 RANEXP Master Port Expander
- 12 4-pin Phoenix connector (supplied with the RANEXPAD)
- 4 Mounting screws and washers (supplied with the RANEXPAD) or 4 mounting screws (RB Part # B0439) and 4 washers (RB Part # WL0315)
- 1 Connecting loop cable (1 supplied per unit)
- 1 Pair shielded cable for connecting AMX Control Link

Associated Equipment

- 1 6-terminal punch block (Graybar part # S66B3-75)
- 1 RANCC16 Control Card Cage
- 1 12 VDC Power Source (e.g., RANPS12)

RAN232 Serial Control Card

Many of the RANGER system's devices are controlled via RS-232 control. In order to emulate these devices' original remote control units with the RANGER, a serial control card that fits in the RANCC16 Control Card Cage. Each device controlled via RS-232 serial commands (e.g., RANLASER, RAN[xx]VS[yy] Video Matrix Switch, RANMENU Character Generator, and RANPCSW Media Center Computer) must have a RAN232 card associated with it. Additionally these cards must be appropriately configured for the communication parameters of the associated device. The RAN232 card mounts in the RANCC16 Control Card Cage and requires a 12VDC at 45mA power source.



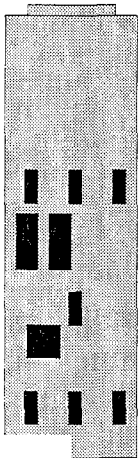
Parts Required

- 1 Interface serial cable (check the table below for the appropriate cable for the device that you are configuring)

Associated Equipment

- 1 RANCC16 Control Card Cage (see "RANCC16" for more information)

Table 10. Cable/Resource Requirements	
Type of cable	Type of resource
VW2378	RANPCSW (Media Center Computer)
VW2374	RAN[xx]VS[yy] (Video Matrix Switch)
VW2292	RANLASER
VW2378	RANMENU (Character Generator)
VW2395	AutoPatch Video Matrix Switch
VW2353	RANTITLER (Titler)
VW2381	VPO229 (AVS2)



RANIR Infrared Control Card

Many of the devices that are operated through the RANGER system are controlled via infrared control. In order to provide a universal operating interface for all media devices, the RANGER system emulates these devices' original remote control units with the RANIR, an infrared control card that fits in the RANCC16 Control Card Cage. Each IR controlled device (e.g., RANVCR, RANCDI, and RANVFLOP) must have a card associated with it. Additionally, these cards must be programmed with the appropriate IR codes (usually supplied by Rauland-Borg). The RANIR card mounts in the RANCC16 Control Card Cage and requires 12VDC at 45mA power source. If you are planning on including IR controlled devices that are not supplied by Rauland-Borg and you do not have a RANIRIS Infrared Capture Unit, please check with Rauland-Borg prior to installation as to the availability of the proper IR codes for the devices you will be using (including the classroom television). If these devices are not part of our "library," you may have to send the devices to Rauland-Borg for programming purposes.

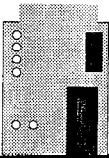
Parts Required

- 1 IR Transmitter Cable (per IR device). This cable is supplied with the RANIR card.

IR programming file to match the device that you are installing (if the device was not provided by Rauland-Borg, you may need to send the manufacturer's remote to us) or learn the codes using the RANIRIS Infrared Capture Unit.

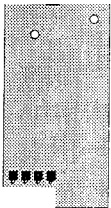
Associated Equipment

- 1 RANCC16 Control Card Cage (see “RANCC16” for more information)
- 1 RANIRIS Infrared Capture Unit (optional)
- 1 IRLIB program (supplied with all RANGER systems)



RANDTMF Interface Board

The RANDTMF card is an interface board that allows users to control RANGER resource media devices from telephones. The card mounts in the RANCC16 Control Card Cage



through the RANGER Media Center, and then dial a specified extension or hunt group (if equipped with Caller ID) to connect to the RANDTMF card. Once the card picks up users can then control the media device using the telephone keypad. One RANDTMF card is required for every simultaneous DTMF point-of-access. The card mounts in the RANCC16 Control Card Cage and requires 12VDC at 90mA power source. See Chapter 5 for more information.

Note: The RANDTMF requires a 48V subscriber loop and a disconnect pulse at hang-up.

Parts Required

- 1 8-pin DTMF interface board (supplied with the RANDTMF)

Associated Equipment

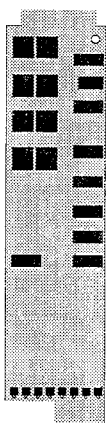
- 1 RANCC16 Control Card Cage
- Telecenter V System and Telecenter System 21

RANRELAY8 Universal Relay Card

The RANRELAY8 is a universal relay card that provides eight isolated contact closures. The single-pole-double-throw (SPDT) relays are individually assignable and addressable as normally open (NO) or normally closed (NC) by moving a jumper provided on the card. These relays can be programmed to do a variety of functions in the RANGER system. Most notably, relay cards are likely to be used to trigger an alarm that reminds staff that scheduled events are overdue for loading. The card has LEDs that indicate which relay is active. These cards can be linked so a larger number of functions can be controlled. Relays are rated at 1 Amp at 28 volts AC or DC. The RANRELAY8 is housed in the RANCC16 Control Card Cage, which provides the required 12 VDC at 150 mA power supply.

Parts Required

- 2 8-pin Telco modular plug connector (supplied with the RANRELAY8)



Associated Equipment

- 1 RANCC16 Control Card Cage
- Corridor Lamps, Buzzer, 16mm Film Converter

RANRELAY14 Universal Relay Card

The RANRELAY14 is a Universal relay card that provides fourteen isolated contact closures. These relays can be programmed to perform a variety of functions in the RANGER system. Most notably, relay cards are used to trigger an alarm to remind staff that scheduled events are overdue for loading. The card has LEDs that indicate which relay is active. These cards can be linked so a larger number of functions can be controlled. Relays are rated at 1 Amp at 28 volts AC or DC. The RANRELAY14 is housed in the RANCC16 Control Card Cage and requires a 12 VDC at 150 mA power supply.

Parts Required

- 2 8-pin Phoenix connector (supplied with the RANRELAY14)
- 1 RANCC16 Control Card Cage

Associated Equipment

Corridor Lamps, Buzzer, 16mm Film Converter

RANIRIS Infrared Capture Unit

Many RANGER system devices are infrared controlled. In order to provide a universal operating interface for all media devices, the RANGER system emulates these devices' original remote control units with the RANIR Infrared Control Card, an infrared control card that fits in the RANCC16 Control Card Cage. Each IR controlled device (e.g. RANVCR, RANCDI, or RANVFLOP) must have a card associated with it. For control at the classroom television, you must have a RANCL201CP or RANCC16. Additionally these cards must be programmed with the appropriate IR codes (usually supplied by Rauland-Borg). The RANIRIS is an optional external unit that allows authorized Rauland-Borg distributors to create custom IR codes to match units with remotes that do not have codes supplied by Rauland-Borg Corporation.

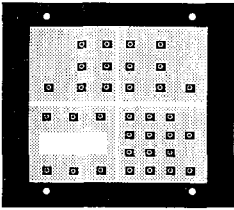
Parts Required

- 1 RANIRLIB (software to create and download IR library) (not included, but supplied with RANGER Media Center software)
- 1 9-pin female data connector to connect from RANIRIS RS-232 port to serial port on a PC (not included) VW2293

Associated Equipment

- 1 RANPCSW (Media Center computer) or other PC compatible with a free RS-232 port (not included)

Classroom



Note: The RANCC16 cannot be used in conjunction with the RANCL201CP.

RANCLASS1 Classroom Control Panel

The RANCLASS1 is a classroom control panel that permits the teacher to access and fully control from the classroom centrally-located media devices such as VCRs, Laser Disc Players, etc. It is only a control device and does not provide any video demultiplexing. In baseband systems the RANCLASS1 requires a RANCL101 Classroom Controller. The RANCLASS1 mounts into an 8" × 10" × 4" junction box. Mount it on an appropriate wall where a user will be able to see the TV while operating the RANCLASS1. Some of the units features include: logical, easy-to-use format, programmable password assigned to teacher for unauthorized access to the panel, and serial port to support Level III Laser Disc control. It requires a 10-14VDC at 300mA power supply which is supplied by the RANCL101 Classroom Controller.

Parts Required

- 1 RANBOX2 or 8 × 10 × 4 Backbox (Hoffman A-SE 10 × 8 × 4)

Associated Equipment

- 1 RANCL101 Classroom Controller
- 1 RANCLINTF TV Interface Box(optional)
- 1 RANFBINT TV Interface Box(for fiber systems)
- 1 RANDATA Level III Laser Disc Controller
- 1 RANMONxx (e.g., RANMON27) or customer supplied monitor

RANCL101 Classroom Controller



The RANCL101 is a baseband classroom electronics unit that replaces the RANCL100. The RANCL101 mounts directly on either a Bretford or Peerless television mount (other mounts may require the drilling of 4 mounting holes) and is primarily designed to function in tandem with the RANCLASS1 Classroom Control Panel. The unit resembles a small VCR and includes the following features: IR detector and transmitter, local/headend audio/video switching (when used with a RANCLASS1), audio/video demultiplexing connections for Level III laser disc control, stereo audio with improved performance and automatic stereo/mono switching, video coaxial equalizer for improved video signal, audio/video optocoupler to eliminate ground loops and add ±6 dB of gain

or loss for cable compensation and accommodations for mounting a RANAVMS1 (stereo multiplexer for distributed local origination).

Parts Required

- 1 AC Outlet

Associated Equipment

- 1 Classroom monitor mount (e.g., RANHRDS27)
- 1 RANMONxx (e.g., RANMON27)
- 1 RANCLASS1 (only for classrooms with classroom panel)
- 1 RANBOX2 (for surface mounting of RANCLASS1 only)
- 1 VW2290-372 (refer to drawing for the VW2290-372) (supplied with the RANCL101)
- 1 Control Link wire (e.g., WPD291)
- 1 75Ω video cable (e.g., WP815) or Fiber Optic cable (from headend)
- 1 VP0400, IR Transmitter Cable (supplied with the RANCL101)
- 1 RANCLINTF TV Interface Box (optional)
- 1 Two-Gang Electrical Box (if RANCLINTF is used)
- 1 AB3905 Mounting Bracket for the RANCL101CP (supplied with the RANCL101)
- 1 VW2290-336 (refer to drawing for the VW2290-336) (supplied with the RANCL101)

For Local Origination

- 1 RANAVJ Audio and Video Jack
- 1 RANAVMS1 Audio/Video Multiplexer Module (installs inside the RANCL101 for systems that require distributed local origination—see “RANAVMS2” for more information)

For Fiber Systems

- 1 RANFBINT, Fiber interface box (used instead of RANCLINTF)
- 1 RANFT1 or RANFT1FM Fiber Transmitter Card (only for return video on systems with local origination)
- 1 RANFR1 or RANFR1FM Fiber Receiver Card
- 1 RANBOX4 (only for surface mounting the RANFBINT) or Hoffman Engineering 8 × 10 × 4 back box, part number A-SE10X8X4.



Note: the RANCL101CP cannot be used with the RANCLASS1.

THE RANCL101CP IS A BASEBAND CLASSROOM ELECTRONICS UNIT THAT COMBINES THE FUNCTIONS OF THE CPU FROM THE RANCLASS1 Classroom Control Panel with those of the RANCL101 providing an efficient and cost-effective means of providing control for remote-only systems. The RANCL101CP mounts directly on either a Bretford or Peerless television mount (other mounts may require the drilling of 4 mounting holes). The unit resembles a small VCR and includes the following features: IR detector and transmitter, local/headend audio/video switching, audio/video demultiplexing, connections for Level III laser disc control, stereo audio with improved performance and automatic stereo/mono switching, video coaxial equalizer for improved video signal, audio/video optocoupler to eliminate ground loops and add ± 6 dB of gain or loss for cable compensation and accommodations for mounting a RANAVMS1 (stereo multiplexer for distributed local origination).

Parts Required

- 1 AC Outlet

Associated Equipment

- 1 Classroom monitor mount (e.g., RANHRDS27)
- 1 RANMONxx (e.g., RANMON27)
- 1 VW2290-372 (refer to drawing for the VW2290-372) (supplied with the RANCL101CP)
- 1 RANCLINTF TV Interface Box
- 1 Control Link wire (e.g., WPD291)
- 1 75 Ω video cable (e.g., WP815) or Fiber Optic cable (from headend)
- 1 VP0400, IR Transmitter Cable (supplied with the RANCL101CP)
- 1 Two-Gang Electrical Box (if RANCLINTF is used)
- 1 AB3905 Wall Mounting Bracket (supplied with the RANCL101CP)
- 1 VW2290-336 (refer to drawing for the VW2290-336) (supplied with the RANCL101CP)

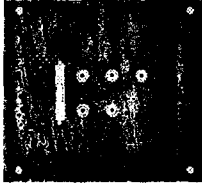
For Local Origination

- 1 RANAVJ Audio and Video Jack
- 1 RANAVMS1 Audio/Video Multiplexer Module (installs inside the RANCL101CP for systems that require distributed local origination—see “RANAVMS2” for more information)

For Fiber Systems

- 1 RANFBINT, fiber interface box (used instead of RANCLINTF)

- 1 RANFT1 Fiber Transmitter Card
- 1 RANFR1 Fiber Receiver Card
- 1 RANBOX4 (only for surface mounting)



RANFBINT TV Interface Box

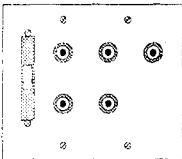
This optional baseband component is a termination point for the headend in the classroom in fiber systems. It is used as an intermediary device between the wall and the classroom controller, and provides mounting for the fiber transmitters and receivers.

Parts Required

- 1 RANBOX4 (only for surface mounting) or Hoffman Engineering 8 × 10 × 4 back box, part number A-SE10X8X4.

Associated Equipment

RANFT1, RANFT1FM, RANFR1, RANFR1FM, RANCL101, RANCL101CP



RANCLINTF TV Interface Box

The RANCLINTF is an optional component used in baseband coax systems. A termination point for the headend in the classroom in fiber systems, it acts as an intermediary device between the wall and the classroom controller. It is possible to connect headend video and data cabling directly to the back of the RANCL101CP Classroom Controller. Please refer to the *Installation Guide* (KI-1856) for pinout information.

Parts Required

- 1 Two-Gang Electrical Box

Associated Equipment

RANCL101, RANCL101CP, RANCLASS1



RANDATA Level III Laser Disc Controller

Used for Level III laser disc control, the RANDATA feeds into a RANCL101 or RANCL101CP Classroom Controller. Be sure to mount the RANDATA close to the computer that will be running the Level III program.

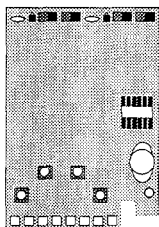
Parts Required

- 1 Single-Gang Electrical Box

Associated Equipment

RANCL101, RANCL101CP, RANCLINTF, RANFBINT, RANCLASS1

RANAVMS1 Audio/Video Multiplexer Module



The RANAVMS1 is a daughter circuit board that plugs into a RANCL101 or RANCL101CP Classroom Controller. It multiplexes the signal from a classroom distributed local origination device (e.g., RANCAMR or NTSC converted computer) so that all locations can receive the information in the proper format.

Parts Required

- 1 RANCL101 or RANCL101CP

Associated Equipment

RANCLASS1, RANCLINTF, RANFBINT

RANPCVID Super Video Windows Card

The RANPCVID is an NTSC to VGA video adapter board that allows standard NTSC signals (like those that might originate from a laser disk player or VCR) to be displayed

demultiplexing unit (RANAVDS2, RANCL101, or RANCL101CP) to decode the video signals that originate at the headend.

Parts Required

- 1 RANLPSW (see section on RANLPSW for more information)
- 1 Windows™ compatible computer with a VGA card equipped with a feature connector (the RANPCVID will not run without the feature connector)
- 2 Interface cables (supplied with the RANPCVID)
- 1 75Ω Terminator (supplied with the RANPCVID)
- 1 Single-source audio/video cable (supplied with the RANPCVID)

Associated Equipment

- 1 RANAVDS2 Audio/Video Demultiplexer Module
- 1 RANCL101 or RANCL101CP Classroom Controller
- 1 Phono to Phono 75Ω video cable (refer to drawing VW2385)

4

Data Networks

This chapter is intended to give you an overview of Data networks within a RANGER system. For more information refer to the *Installation Guide* (KI-1856) and the *Media Center User's Guide* (KI-1731).

RANGER systems may include network client software for either Remote Scheduling or Lesson Plan generation. Currently, the RANGER system works with either Macintosh® AppleShare, Novell Netware® Network Operating System (NOS), or Windows NT. Regardless of the NOS, the RANGER Media Center computer is configured as a network node that must be set up with the appropriate network interface card and cabling. Workstation clients must also have the appropriate network interface card and cabling, as well as Rauland-Borg supplied client software.

Schedule

Note: Schedule software is sold separately from the RANGER Media Center.

RANGER Schedule software (RANREMOTSW) permits users to view and manipulate the RANGER system's courseware-related databases from network nodes. Using Schedule, users can access the RANGER Courseware catalog, search for titles and make media/source machine reservations. All users in the system, including the Media Center, share the same database information. In AppleShare systems, RANGER databases can be housed on the RANGER Media Center computer. In Netware systems, databases are housed on a file server. Reservations are processed by the Media Center software which then reports on the status of pending, active and completed media events. The scheduling/reservations process can also be carried from the headend RANGER Media Center software.

Lesson Plan

Note: Lesson Plan software is sold separately from the RANGER Media Center.

The RANGER Lesson Plan (RANLPSW) software permits users to create multimedia scripts using network client software that simulates a classroom control panel. At its simplest level, Lesson Plan is another classroom control device. Instead of using a dedicated control infrastructure, workstations use the existing data networking scheme (Ethernet or Token Ring) to send instructions back to the RANGER Media Center computer and its associated equipment. The headend equipment interprets the network commands, translates them, then passes them along to control cards that interact with the system's media devices.

Using this control scheme along with the client software's ability to store commands sent to devices, users can interactively develop sequences that can be played back at a later

time. These lesson scripts can work with any number of resource devices, sending commands to each as requested. The actual video output is not stored, only the commands for the devices that will play it back. At the completion of an authoring session, users can save scripts to either their local hard drive or to a Network server. Lessons Plan scripts can then be catalogued as courseware along with other media and are schedulable for playback from either a workstation, or any other RANGER classroom control device. It is also possible to create Lesson Plans using the RANGER Media Center software, without the need for a data network.

Novell Networks

Windows PCs

The RANGER Media Center is connected to the existing network infrastructure as a node. Refer to drawing IL0480.

- The media center computer must be equipped with the appropriate interface card to attach to the network cabling scheme/topology that is in place (Token Ring NIC for a Token Ring Network or 10baseT Ethernet card for a 10baseT network).
- The server must run Netware 2.x or above and be set up for Btrieve (Novell's native database engine).
- The media center computer and Windows workstations that will be associated with it for RANGER activities must be configured to send IPX/SPX messages.
- Workstations that will run RANGER classroom software (Remote Scheduling and Lesson Plan) must: run Windows 3.1 or above w/4+ mgs of RAM; have an appropriate interface card to attach to the network cabling scheme/topology that is in place; be cabled appropriately; and have the ability to log on to the same server as the RANGER Media Center computer.
- Workstations running Windows must be configured for networks.
- RANGER databases will be stored in a directory to which all RANGER nodes have access.
- Workstations must also run Brequest (Novell's network database requester program).

Macintosh Nodes and Windows PCs

In addition to the requirements described above, the following is required for Macintosh Nodes and Windows PCs. Also refer to drawing IL0481.

- Macintosh workstations must run System 7 or above w/4+ mgs of RAM.
- RANGER databases will be stored in a directory to which all RANGER nodes have access.

- The media center computer must additionally have Farallon's PhoneNet PC software installed. This software is not included with the RANGER system: it must be purchased separately (part number VP0499).

AppleShare Networks with Macintosh® Only

The RANGER Media Center is connected to the existing network infrastructure as a node. Refer to drawing IL0482.

- The media center computer must be equipped with the appropriate interface card to attach to the network cabling scheme/topology that is in place (Token Ring NIC for a Token Ring Network or 10baseT Ethernet card for a 10baseT network).
- Macintosh workstations that will run RANGER classroom software (Remote Scheduling and Lesson Plan) must: run System 7 or above w/4+ mgs of RAM; have an appropriate interface card to attach to the network cabling scheme/topology that is in place; be cabled appropriately; and have the ability to log on to the same server as the RANGER Media Center computer.
- The media center computer must additionally have Farallon's PhoneNet PC software installed. This software is not included with the RANGER system: it must be purchased separately (part number VP0499).

5

RANDTMF Interface Board

This chapter is intended to give you an overview of DTMF telephones as a classroom control device in a RANGER system. For more information refer to the *Installation Guide* (KI-1856).

RANGER systems can use DTMF (Dual-Tone Multifrequency) telephones as an alternative classroom control device. As with the RANGER remote control, hardware control panel, or network workstation, DTMF telephone users requiring control of RANGER media resources make reservations for Courseware items (and the media devices appropriate for playback) through either the RANGER Media Center or Remote Scheduling software. When it comes time for media playback, however, users control media resources using the telephone keypad.

Typically, users requiring control of equipment will dial a specified extension (or hunt group) which will then be attached as required to a specific DTMF control card. A system may have many DTMF control cards which communicate with any media device control card. Subject to restrictions detailed later in this section, the RANGER system is capable of identifying callers by processing caller ID messages. In this way a user can schedule media for their locations and the RANGER system will assign control over the appropriate media device to their extension at the time they have requested.

Teaming the RANGER system with a phone system that can produce pure DTMF tones (like the Telecenter® V system or Telecenter® System 21) allows the system to process caller ID messages (as long as those messages are in the form of DTMF tones) to determine which location requires media control. The RANGER system keeps track of which classrooms require DTMF control in the classroom database. Instead of providing a control system address (normally set up through DIP switches in RS485 classrooms), the Telecenter extension is stored. To accommodate for this, DTMF cards in the RANCC16 Control Card Cage are not assigned to specific classrooms or media devices, and are available to users on a first come, first serve basis. Users schedule media to their own location by name (e.g., Room 246). When it is time for their media event, the system switches control of whatever media device they have requested to their extension.

In order for the RANGER system to work using DTMF control the system needs to know whether the phone system produces caller ID tones. If it does, the Media Center needs to know the following:

1. Header length for the caller ID tones.
2. The length of the extension numbers (e.g., 3 digits).
3. The extension starting range.
4. How many extensions will be dedicated for media functions.
5. The control address of each card (slot numbers in the RANCC16 Control Card Cage).

Also, the RANDTMF can only be used if your telephone system is capable of the following:

- Caller ID tones using only DTMF
- Emitting a 48V signal
- Producing a disconnect pulse
- Has three or four digit extensions

Sending RANGER All-Page Audio through a Telecenter System

The RANGER software supports a mechanism whereby an all page may be initiated on the telephone system connected to the RANGER system. All that needs to be specified is the control system address of the DTMF card used to dial the all paging extension, and the extension to dial. Also there must be an audio connection to the RANDTMF card. The extension, for example, would be 700 in Rauland-Borg. The information is contained in the .ini file:

```
[config]
TeleAllPageAddr=14
TeleAllPageExt=700
```

The “TeleAllPageAddr” holds the RANCC16 card slot of the DTMF card, “TeleAllPageExt” holds the extension number to dial for an all page.

Interfacing the Telecenter V System

To interface the RANGER system with the Telecenter V system, use version 402.0 firmware. You will need to enable the DSI integration feature by loading the appropriate passcode value, which you can get from Rauland-Borg Technical Support. All cards should be programmed as DSI line types. Refer to the *Installation Guide* (KI-1856) for more information.

Software Setup

6

This chapter is intended to give you an overview of the software setup that will need to be done before the RANGER system is in working order. For more information refer to the *Media Center User's Guide* (KI-1731).

Once the RANGER system is completely installed, you will need to install the software and configure the system. RANGER systems assembled at the factory come with RANGER Media Center software pre-installed. The software is preconfigured according to the system design that was provided by the distributor (e.g., media devices, video switcher, etc.). It is expected that the installer will configure all appropriate databases (e.g., classrooms, non-Rauland-Borg supplied media devices, teachers, time periods, etc.). Refer to the Assignment worksheets located in the Appendix. Listed below are steps that must be completed for the system to be in working order.

1. If the software has not been factory installed, run the Media Center Software Setup program under Windows Program Manager. This configures and installs the software and hardware that is the "brains" of the system. Installation instructions for the software can be found in KI-1737. As the software programs are updated regularly, check with Rauland-Borg to see whether you have latest version of the installation program. Version information can be found on the labels on the installation disks. If you are unsure of the version information, install the software and consult "About MediaPC," which can be found under Media Center's Help menu.
2. Set the DIP switches and Baud settings on the classroom control device to the appropriate settings (as specified by the setup program). RANGER Media Center is integrally connected to the RS485 control system which communicates with control cards, classroom control devices, and either the RANCPU Control System Master Card, RANBROAD or RANEXP Master Port Expander. During the Media Center software setup process the communication parameters between the Media Center computer (RANPCSW) and the control cards is configured. If you make changes to the defaults, it is critical that you make the corresponding changes in

RANEXP.

3. During the Media Center installation process, a separate program group called "RANGER Configuration" was set up on your Windows desktop. In order to communicate with the control system, prior to running Media Center, you must run the program, "Download Control Program," to transfer the appropriate

control program to either the RANCPU Control System Master Card, RANBROAD or RANEXP Master Port Expander.

4. All RS485 classroom control devices must have unique dip switch settable identity in the system. In order for the system to operate correctly this information must be entered into the classroom database ("Panel Control Address"). Consult the installation instructions for the RANCL101CP, RANCL201CP, and RANCLASS1 for more information. Additionally, if this RANGER system involves RS485 TV control, you must also download the appropriate IR codes to the classroom control devices for the TV devices (or tuners) that will be associated with this location. As with all other IR devices, consult with Rauland-Borg to determine whether the devices that will be used are part of Rauland-Borg's library. If you do not have a RANIRIS Infrared Capture Unit, you may need to send your IR remote to Rauland-Borg so that we may add its information to our library. Classroom control devices will come factory installed with firmware. If it is necessary to update the firmware in the control device, you will need to run "Send Panel Program" (also part of the RANGER Configuration program group.
5. Under normal installation conditions Media Center software will be installed using empty (or "null") databases. If the software has not been factory installed, the distributor must enter database information regarding controllable resources, fixed resources, titlers, classrooms, teachers, time periods, teachers and courseware. Typically, if the software has been factory installed, Rauland-Borg will configure the system with information from the rack-layout. It will still be up to the distributor to enter information regarding teachers, courseware, time periods (sample time period databases are available on the Rauland BBS), classrooms, and additional devices that were not specified in the rack layout. *Note:* locations that will be controlling the system from network workstations must be defined as Lesson Plan workstations in the classroom database. For more information on database setup, see KI-1737 "System Database Setup," and "Building Databases."
6. If the system will be using DTMF as a means of control in any of its locations, it will be helpful to have a list of architectural locations and their corresponding extension numbers. It will also be helpful to have a list of users and their telephone PIN numbers. This information will have to be added in the classroom and teacher database.
7. If this system will include network client software for either Scheduling or Lesson Plan, it is important that the workstations be configured to share the same databases as the Media Center. For more information on this see *Schedule User's Guide* (Remote Scheduling Software), KI-1847. For information on setting up Lesson Plan, see *Lesson Plan User's Guide*, KI-1848.
8. If a school would like to incorporate courseware information that is housed in a separate system (e.g., Library Automation), the software must be available as a tab-delimited ASCII text file. A special utility is available on request to transfer external database information to the RANGER format.

9. If the system will include Macintosh workstations or Novell workstation, please consult the "Data Networks" section of this planning guide. Workstation software is sold separately from Media Center software. It also must be set up separately. Each program has its own set up program. For information on setting up Schedule (Remote Scheduling Software), see KI-1847. For information on setting up Lesson Plan, see KI-1848.
10. For locations that will use the RANHHELD IR remote control, make sure that you have enough units for the number of locations that require them, and that each unit has working batteries. The RANHHELD comes with two AAA batteries.

7

Wiring and Cable Requirements

Type of cable	Type of resource
VW2378	RANPCSW (Media Center Computer)
VW2374	RAN[xx]VS[yy] (Video Matrix Switch)
VW2292	RANLASER
VW2378	RANMENU (Character Generator)
VW2395	AutoPatch Video Matrix Switch
VW2381	VPO229 (AVS2)

Media Center to Classroom

Type	West Penn	Belden	Max. Distance
RG59	843	8102	1000'
RG6	842	9291	1200'
RG11	821	9291	2000'

Note: One additional home-run cable is required for areas with distributed local origination.

West Penn	Belden
92022	25364

Note: One additional home-run cable is required for areas with distributed local origination.

Table 14. Control Cable: 1 Home-Run Cable or Looped Run Max. Capacitance 60,000pF		
Cable	Max. Cumulative Distance	Max. Distance per Run
WP D291	27600'	2300'
WP 291	14400'	1200'
WP D2401	48000'	4000'
WP D252401 (Plenum)	48000'	4000'
Belden 8102	54000'	4500'

Wiring Notes for RANEXP or RANBROAD (Preferred)

In order for the RANGER system to operate correctly with your RANEXP or RANBROAD, it is imperative that you do not exceed the distances specified for the cable that you are using (as detailed in the following table).

1. Locate on the chart the type of cable you are using.

Type of Cable	Maximum Cumulative Distance per RANEXP	Maximum Cumulative Distance per RANBROAD	Maximum Distance per AXLINK port on the RANEXP or RANBROAD
WP D291	27,600	23,000	2,300
WP 291	14,400	12,000	1,200
WP D2401	48,000	40,000	4,000
WP D252401 (Plenum)	48,000	40,000	4,000
Belden 8102	54,000	45,000	4,500

2. Add up all the cable distances per classroom and get the total distance. See the second column in the example that follows.
3. Locate the cable that your are using in the “Maximum Cable Distances for use with RANEXP or RANBROAD” chart detailed above. Divide the “Total Cable Distance” that you calculated in the previous step by the “Maximum Distance per AXLINK port on the RANEXP or RANBROAD.”
4. The number that you arrive at will determine the number of RANEXP or RANBROAD AXLINK ports needed. In our example this is the last column. If the number you arrive at is larger than 12 for the RANEXP or 10 for the RANBROAD, you will need to add a RANEXPAD or another RANBROAD.

Table 16. RANEXP or RANBROAD Port Estimation Example			
Type of Cable	Total Cable Distance	Max. Distance per AXLINK Port on the RANEXP or RANBROAD	Number of RANEXP or RANBROAD AXLINK Ports
WP D291	4,870	2,300	3
WP 291	3,807	1,200	4
WP D2401	8,899	4,000	3
WP D252401 (Plenum)	7,065	4,000	2
Belden 8102	8,038	4,500	2

The number of punch blocks (S66B3-75) you use will be dependent on the length of your cable runs and the way you configure the RANEXP or RANBROAD ports.

Table 17. Max. Cable Distances for use with RANCPU		
Cable	Capacitance per foot	Maximum Cumulative Distance in (feet)
WP D291	26	2,300
WP 291	45	1,200
WP D2401	14.5	4,000
WP D252401 (Plenum)	14.5	4,000
Belden 8102	12.5	4,500