CELLCOM 10 DIGITAL WIRELESS

Version 1.5.6.5

INSTRUCTION MANUAL

CellCom 10 Instruction Manual
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IMPORTANT SAFETY INSTRUCTIONS

Please read and follow these instructions before operating a CellCom 10 wireless communication system. Keep these instructions for future reference.

Please read and follow these instructions before operating a CellCom 10 wireless communication system.

(1) **WARNING**: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

(2) Do not use the apparatus near water.

(3) Clean only with a dry cloth.

(4) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions. Install the CellCom 10 wireless communication system according to the directions in the Installation Chapter of this manual.

(5) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not place naked flame sources such as candles on or near the matrix.

(6) Do not defeat the safety purpose of the polarized plug or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

(7) Protect power leads from being walked on or pinched particularly at plugs, at convenience receptacles, and at the point where they exit from the apparatus.

Note: A "convenience receptacle" is an extra AC power outlet located on the back of a piece of equipment, intended to allow you to power other equipment.

(8) Only use attachments/accessories specified by the manufacturer.

(9) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

(10) Unplug the apparatus during lightning storms or when unused for long periods of time.

(11) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as a power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

(12) The CellCom 10 wireless communication system contains a non-user serviceable battery.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.

Lithium batteries can overheat or explode if they are shorted. When you handle the CPU card or a loose battery, DO NOT touch any external electrical conductors to the battery's terminals or to the circuits that the terminals are connected to.

Please familiarize yourself with the safety symbols in Figure 1. When you see these symbols on a CellCom 10 wireless communication system, they warn you of the potential danger of electric shock if the system is used improperly. They also refer you to important operating and maintenance instructions in the manual.

This symbol alerts you to the presence of uninsulated dangerous voltage within the product's enclosure that might be of sufficient magnitude to constitute a risk of electric shock. Do not open the product's case.

This symbol informs you that important operating and maintenance instructions are included in the literature accompanying this product.

Safety Symbols

EMC AND SAFETY

The CellCom-10 wireless communication system meets all relevant CE, FCC, UL, and CSA specifications set out below:

EN55103-1 Electromagnetic compatibility. Product family standard for audio, video, audio-visual, and entertainment lighting control apparatus for professional use. Part 1: Emissions.

EN55103-2 Electromagnetic compatibility. Product family standard for audio, video, audio-visual, and entertainment lighting control apparatus for professional use. Part 2: Immunity.

UL 60065-7, CAN/CSA-C22.2 No.60065-3, IEC 60065-7 Safety requirements.

And thereby compliance with the requirement of Electromagnetic Compatibility Directive 2004/108/EC and Low Voltage Directive 2006/95/EC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

GETTING STARTED: AN INTRODUCTION TO CELLCOM 10

With a CellCom 10 wireless beltpack you can roam freely around a studio or production facility while talking and listening to all, or selected, members of the production team. With its six communication routes, the beltpack gives you the flexibility to communicate quickly and seamlessly with individuals or groups, and to change communication routes as often as needed.

CellCom 10™ is the North American name for the award-winning FreeSpeak® technology, the world's first wireless system to include local route programming, crosspoint level control, assignment of IFBs, groups, and full non-blocking mixing facilities.

A CellCom 10 system consists of three basic elements: the base station, wireless beltpack, and antenna.

In the United States the system operates in the unlicensed 1.92 GHz to 1.93 GHz band. With its unique and innovative digital technology, which continually searches for unused radio frequency (RF) channels, CellCom avoids the noise and interference issues associated with traditional wireless systems using congested UHF and VHF bands.

With the basic three elements you can design a digital wireless system for your specific requirements.

Figure 1-1: A CellCom 10 Antenna, Beltpack, and Base Station

CellCom 10 allows you to set up a wireless system specifically tailored to your needs, by locating antennas and beltpacks in areas where they are needed most. And because the beltpacks operate in the unlicensed 1.92 to 1.93 GHz frequency spectrum, there is no interference with existing wireless systems, even those located in the same production area.

CellCom 10 may be used stand-alone or connected with party-line and/or digital matrix intercom systems. The base station holds connections for several wired interfaces, including party lines, 4-wire sources, a program audio source, and a stage announce output device. When wired to the base station, these devices

communicate seamlessly with the wireless beltpacks. Party-line beltpacks and 4-wire matrix stations and panels can key directly to wireless beltpack by name.

CELLCOM 10 FEATURES

Features of CellCom 10 include:

The CellCom 10 base station functions as a full-duplex digital matrix switcher and router for voice communications.

- Base station in one rack unit (1 RU).
- Up to ten wireless beltpacks.
- Point-to-point and small group wireless communications.
- Up to six communication routes per beltpack.
- Party-line beltpacks, 4-wire devices, program audio source, and stage announce output seamlessly included in communication system.
- Up to ten remote transceiver/antennas create custom coverage zones.
- Transceiver/antennas can be located up to 1,000 meters (3,200 feet) using 24 AWG cable or up to 500 meters (1,600feet) using 26 AWG cable over CAT-5 cable from the base station avoiding expensive RF cable.
- Five-character labels for each beltpack and wired connection.
- Communication groups can be created, customized, and assigned to beltpack keys.
- License-free operation in the 1.9 GHz band—above television and other wireless communications.
- Frequency-hopping DECT technology automatically finds clear spectrum.
- Base functions like a digital matrix; each beltpack has a “virtual port” timeslot.
- Secure system—beltpacks are registered to a particular base and can frequency hop.
- Two bases can connect locally for a 20-beltpack system

Each antenna can support communications with up to five wireless beltpacks operating within its coverage zone.

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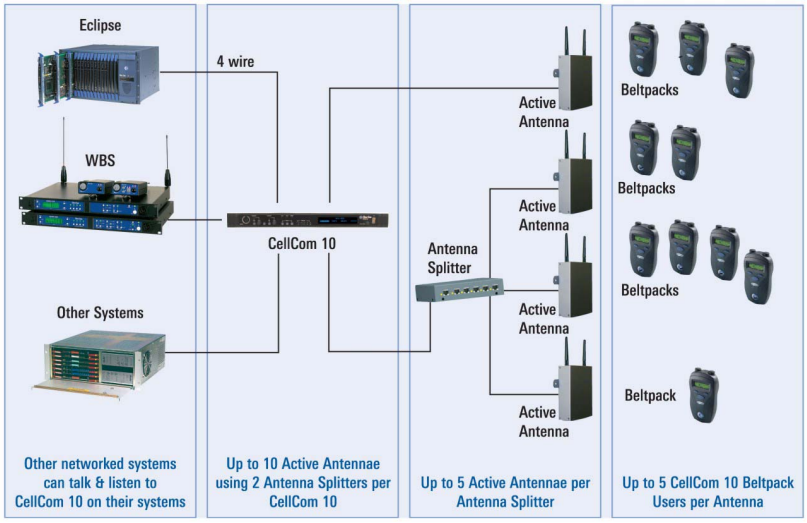


Figure 1-2: A CellCom 10 Digital Wireless Communication System

A CELLCOM 10 COMMUNICATION SYSTEM

A CellCom 10 system consists of three basic elements:

- The wireless beltpacks.
- The base station that routes communication to and from wireless beltpacks and other audio devices.
- The transceiver/antennas that provide custom coverage zones in which four to five beltpacks can operate. Beltpacks can roam freely between coverage zones.

CellCom operates using a cellular network of antennas located around a working environment. The antennas connect directly to the CellCom base station with CAT-5 cable. Each antenna provides an area or “cell” in which four to five full-duplex beltpacks can operate. Figure 1-2 on page 3above shows an example configuration.

Beltpacks can roam among and between cells without dropping off because each antenna continually signals a beltpack as to the strongest available signal. When the signal from an antenna starts to diminish due to the distance from a beltpack, the beltpack automatically “hands off” its signal to the nearest antenna, ensuring smooth transfer.

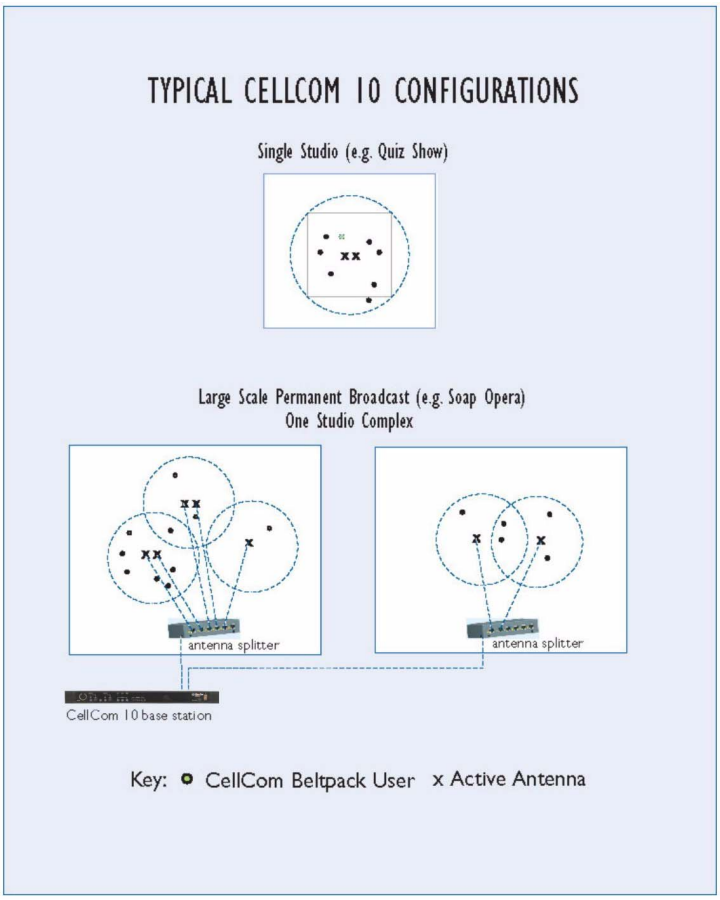


Figure 1-3: Configurations for a Studio and Large-Scale Broadcast Facility

Using an antenna splitter allows you to connect up to five antennas to one base-station antenna port. A single CellCom base station supports ten beltpacks and up to ten antennas, giving you a great deal of flexibility in placing beltpacks where they are needed most, and for providing wireless reliability. For added coverage, you can connect a second CellCom 10 base station to the first, creating a 20-beltpack system. Figure 1-3 illustrates how a CellCom 10 system can be set up to operate in a single studio or in a large-scale permanent broadcast facility.

Note: Each antenna is designed to handle five beltpacks simultaneously in good conditions. However, if interference or propagation problems occur in an area, to ensure proper operation and reliability, it may be more practical to install four beltpacks for each antenna.

For zones in which you are likely to need coverage for five or more beltpacks simultaneously, it is recommended that you install a second antenna. Similarly, for good coverage for nine or more beltpacks simultaneously, a third antenna may be required.

Note for North American customers: The limited bandwidth of 1.92–1.93 GHz allows one RF cell to accomodate a maximum of five transceiver antennas. A base station can therefore furnish two separate cells with a total of ten antennas.

2 QUICK START

The following exercise demonstrates how to set up a simple configuration of wired and wireless devices in a CellCom 10 system. You should have some familiarity with how CellCom 10 operates before attempting this exercise. If you do not, please read through the manual first, and then do the exercise.

To complete the exercise, you will need the following equipment.The goal is to establish communication between these devices:

- A CellCom 10 system including two wireless beltpacks, an antenna, and a base station.
- A 4-wire audio source, such as an Eclipse matrix.
- A wired beltpack, such as a Clear-Com 501 or 601 beltpack.

This exercise demonstrates how to set up a simple configuration.

Specifically, this quick-start exercise shows you how to:

- Wire the CellCom 10 base station to a party-line beltpack, a 4-wire audio source, and a CellCom 10 antenna.
- Assign labels to two CellCom10 wireless beltpacks.
- From the CellCom 10 base station, create a group containing the wired and wireless devices.
- Initiate calls between members of the group.

In this exercise, you establish communication between a group of wired and wireless devices.

***Note**: For a quick overview of the CellCom 10 programming menus, refer to Appendix 2.*

CONNECTING THE BASE STATION

To connect the CellCom base station to a party-line beltpack:

1. Make sure the CellCom base station is powered off.
2. Connect an XLR cable from the "PL CH-A" connector on the rear of the CellCom base station to a wired party-line beltpack, such as an RS-601. See Figure 2-1 for an illustration.

   Note: Externally powered party-line equipment, CellCom splitters, and CellCom active antennas should always be connected and powered up before powering the CellCom base station.

To Connect the CellCom Base Station to a 4-wire matrix port:

1. Connect a CAT-5 cable from the CellCom base station's leftmost 4-wire audio port (labeled "4-Wire/Eclipse Ports") to an external 4-wire audio source, such as an Eclipse matrix port. See Figure 2-1 for an illustration.

To Connect to the CellCom Base Station to an Antenna

1. Connect a CAT-5 cable from transceiver port 1 on the CellCom base station's rear panel to a CellCom antenna. See Figure 2-1 for an illustration.

2. Power up the base station.
3. Power up the beltpacks.

   If the beltpacks do not connect to the base station within 30 seconds, check that they are registered to the base station. If they are not, refer to the chapter "*CellCom Toolkit*" for instructions on registering the beltpacks to the base station.

Always power up external party-line equipment, CellCom splitters, and CellCom active antennas before powering the CellCom 10 base station.

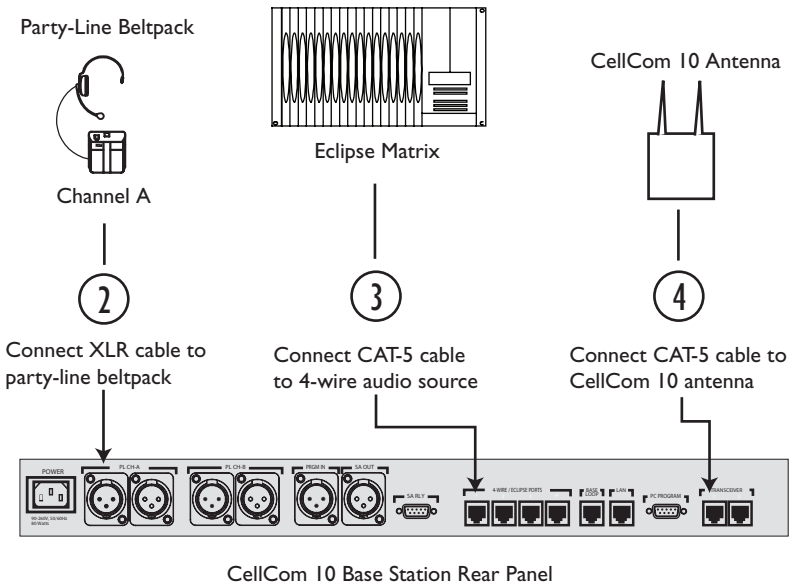


Figure 2-1: Connect the CellCom Base Station to the Wired Devices

4. To get the CellCom 10 into a "clean" state for the example below, from the base station's front-panel display, scroll to and select PORTS, then 4WIR1, then CALLS, then NONE. (NONE is the last element in the list.) Then also select PORTS, then PLCHA, then CALLS, then NONE. (See Figure 2-2.)

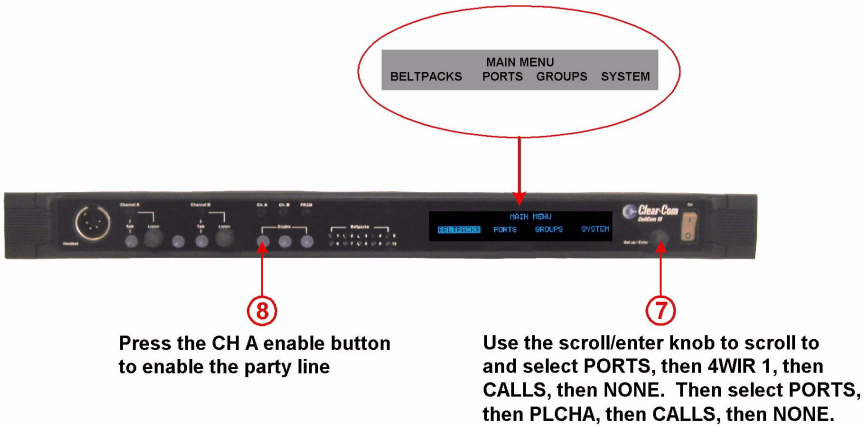


Figure 2-2: Clear the Base Station's Memory and Enable the Party Line

5. Enable the party line by pressing the CH A enable button on the base staton's front panel until the CH A enable light illuminates. (See Figure 2-2.)

Be aware that a loud tone is generated in the party-line beltpack's headset when it is first enabled from the front panel. This tone enables the base station to perform auto-nulling of the party line.

OVERVIEW OF BELTPACK OPERATION

Figure 2-3: Overview of Beltpack Operation

ASSIGNING LABELS TO THE CELLCOM BELTPACKS

To assign a name ("label") to CellCom beltpack #1:

1. From the base station's front-panel display, use the setup/enter knob to select BELTPACKS, then BPK01, and then LABEL.

   Rotate the setup/enter knob until the desired item is highlighted. Press the knob in to select the item.

2. Rotate the setup/enter knob again to select the alphanumeric character that you wish to edit, then push the setup/enter knob in to select the character. Rotate the knob to select the character you wish to replace it with. Press the knob in to select the new character.
3. When you have completed selecting characters for the beltpack's item label, press the setup/enter knob again to save.

   A message appears on the base station's screen to let you know the changes have been saved and applied.
4. To exit the menu, select and then deselect (by pressing the knob again) the fifth character in the menu.
5. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.
6. Power cycle the beltpack off and then on again to see the changes reflected in the beltpack's front-panel display.
7. Repeat this entire process for the second wireless beltpack, BPK02.

CREATING A GROUP

To create a group:

1. From the base station's front panel, use the setup/enter knob to scroll to and select GROUPS, then GP#01, then MEMBERS.

   A number of entries in the MEMBERS menu are outlined. An outline around a menu entry means that it is a member of the group. When you select an item, an outline appears around it. When you select the item again, the outline disappears.
2. Select the following members of the group: 4WIR1, PLCHA, BPK01, BPK02, so that only these entries are outlined.
3. To exit the Group Members menu, scroll to and select BACK from the base station's front-panel menu.
4. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

ASSIGNING THE GROUP LABEL TO CELLCOM BELT-PACK KEYS

You will now assign the group label you created in the prevous step, GP#01, to the first key of each of the CellCom wireless beltpacks.

To assign the group label to the first key of CellCom beltpack #1:

1. From the base station's front-panel menu. select BELTPACKS, then BPK01, then KEYS. You will now see a list showing how the 3 pages of 2 keys are currently assigned on beltpack #1.
2. Select "Pg1-1" to edit the first key of the first page. You will see a list of destinations to which you can assign this key.

3. Rotate the setup/enter knob clockwise until “GP#01” is highlighted, then press the knob to select it. The base station’s display should return to the key list.
4. Select BACK, then BACK again to return to the list of beltpacks.
5. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.
6. Repeat the procedure for beltpack #2.

CALLING THE GROUP FROM THE WIRELESS BELT-PACKS

To call the group from beltpack #1:

1. If beltpack #1’s label BPK01 does not appear on page #1 (indicated by the numbers in the center of the display), use the beltpack’s left and right scroll buttons to move to page 1.

   The label under the left-hand rotary controller should now read GRP01.
2. Press the rotary controller briefly to latch the talk path to “on.”
   - The red talk light and green listen light next to the rotary controller should light.
   - Note that if you press the rotary controller for too long, the talk path will not latch—the path will be deleted, and the green and red lights will extinguish when you release the rotary controller.
   - **Examine the wired beltpack attached to party-line channel A**. The call signal light should light for approximately 5 seconds. You should be able to hear audio from beltpack #1 in the wired beltpack’s headset. If you open the microphone of the wired beltpack, the wireless beltpack should also be able to hear the audio.
   - **The 4-wire device should have 2-way audio**. The wireless beltpack should be able to hear audio from the 4-wire device, and the 4-wire device should be able to hear audio from the wireless beltpack.
   - **Examine wireless beltpack #2**. If it is on page #1, the green (listen) light should be flashing, and you should be able to hear audio from beltpack #1. At this point, beltpack #1 won’t be able to hear audio from beltpack #2.
3. Press the leftmost rotary knob on beltpack #2, which is next to the flashing green light.

   All stations are able to hear beltpack #2 as well as beltpack #1. In other words, all stations can hear each other.
4. Press the leftmost rotary controllers on beltpacks #1 and #2 briefly to unlatch them. This deactivates all talk and listen paths.
5. Repeat the entire process for CellCom beltpack #2.

CALLING THE GROUP FROM THE 4-WIRE AUDIO DEVICE

1. From the base station's front-panel menu, select PORTS, then 4WIR1, then CALLS, then GP#01.

   Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

   - All stations should now be able to hear the audio coming in from the 4-wire device.
   - On the two wireless beltpacks, the green (listen) lights should be flashing, indicating an incoming call to group #1 from a member of group #1.

2. Note that if the base station is power cycled off and on again, the talk paths from the 4-wire device are automatically re-established to the wired beltpack and to the two wireless beltpacks.
3. You can remove the talk paths from the 4-wire device to the wired beltpack and to the two wireless beltpacks by selecting PORTS, then 4WIR1, then CALLS, then NONE, from the base station's front-panel menu.

CALLING THE GROUP FROM THE WIRED PARTY-LINE BELTPACK

1. From the base station's front-panel menu, select PORTS, then PLCHA, then CALLS, then GP#01.

   Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

2. Ater a few seconds, when the wireless beltpacks reconnect, talk from the wired beltpack's microphone.

   - Audio from the wired beltpack should be audible on the two wireless belpacks, and on the 4-wire audio device.

     On the wireless beltpacks. the green (listen) light should be flashing, indicating an incoming call to group #1 from a member of group #1.

   - Audio from the 4-wire audio device will be audible from the wired beltpack's headset.

3. If the base unit is powered down and then up again, the talk paths from the wired beltpack (on party-line channel A) are re-established to the 4-wire device and to the two wireless beltpacks.
4. You can remove the talk paths from the wired beltpack's party line to the other devices by selecting PORTS, then PLCHA, then CALLS, then NONE, or by disabling the party line from the front panel of the CellCom base station by using the CH A and CH B enable buttons.

3 OPERATING THE CELLCOM 10 BASE STATION

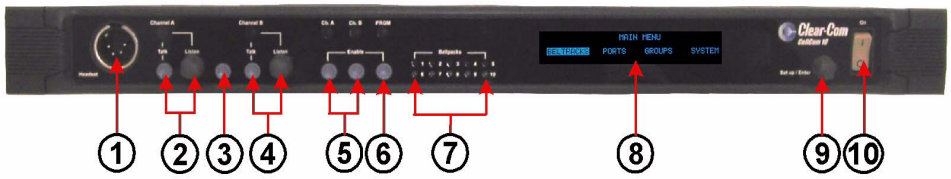
INTRODUCTION

The CellCom 10 base station provides all of the intelligence and signal routing for the CellCom 10 digital wireless intercom system. The base station is effectively a full-duplex digital matrix communications system, with virtual "ports" for the wireless beltpacks rather than physical ports.

In its memory, the base station contains all of the labels and communications paths assigned to each CEL-BP beltpack, and this information is sent to the beltpacks via the CEL-TA transceiver/antennas as soon as they are switched on and recognized by the base.

The base station also functions as the interface between wired and wireless communication devices. The two party-line intercom connectors, four 4-wire connectors, and program input/stage-announce output each have their own full-duplex time slot. They can be labeled, added to communication groups, and assigned to beltpacks as desired.

UNDERSTANDING FRONT-PANEL OPERATION



1 Headset Connector
2 Headset Channel A Talk and Listen Controls
3 Channel A/B Call Switch (not used)
4 Headset Channel B Talk and Listen Controls
5 Party Line Channels A and B
6 Program Audio Enable Switch
7 Wireless Beltpack Light Display
8 Display Screen
9 Scroll/Enter Knob
10 Power Switch

Figure 3-1: CellCom 10 Base Station Front Panel

(1) Headset Connector

The 4-pin male XLR-type headset socket connects to Clear-Com headsets and other headsets with 4-pin female connectors. This headset connector is for the onboard two-channel intercom, with controls just to the right of the connector.

② Channel A Talk Switch and Light/Listen Level Knob

The channel A talk switch and associated light, and listen level knob, allow full-duplex conversations with any CellCom 10 wireless beltpacks or other communications systems wired to the rear of the base station to which the onboard Channel A has been assigned. Assignments are done via the front-panel programming.

The talk switch is momentary/latching, such that pressing it and holding down will create a talk path that ends when the user releases the switch, while quickly tapping it will latch the talk, and a second tap will release it. The LED lights red when a talk is active.

Turning the listen level knob clockwise will allow the user to hear the other party's voice, increasing the level to maximum when fully clockwise.

③ A/B Call Switch

The A/B call switch does not function. It is reserved for future use.

④ Channel B Talk Switch and Light/Listen Level Knob

The channel B talk switch and associated light, and listen level knob, function the same as the controls for Channel A.

⑤ Party Line Channels A and B Enable Switches

The channel A and channel B enable switches and associated lights activate the connection on the rear-panel to party-line intercom channels A and B. Activating one or both of these switches makes duplex communications between the wireless beltpacks and the wired party-line intercom occur. These switches may be "locked" via the front-panel SYSTEM programming menu so that they may not be disengaged accidentally.

⑥ Program Audio Enable Switch and Light

This latching switch makes any program audio signal that enters via the rear-panel line-level 3-pin XLR connector available to be assigned to wireless beltpacks, either separately or mixed with communications groups. This switch may be "locked" via the front-panel SYSTEM programming menu so that it may not be disengaged accidentally.

⑦ Wireless Beltpack Light Display

These green LEDs, one for each of the ten CEL-BP wireless beltpacks that the base will support, light when a beltpack is on and connected with the system. For example, the beltpack that is registered with the base in the BPK03 time slot will light the LED under number 3 when turned on.

⑧ Display Screen

The display screen shows all of the menus and programming options that are available within the CellCom 10 system. The user can select a particular beltpack and view all of its current talk/listen assignments, or see all of the current members of a particular group. Via the screen and rotary encoder, labels (5-character user names) can be created and/or changed, new members assigned to groups, input and output levels adjusted, and so on.

⑨ Setup/Enter Knob

The setup/enter knob is used to scroll through the various menu options within the CellCom 10 base, in order to discover specific information regarding users or to program communications routes and groups. Turning the knob clockwise scrolls display items toward the right, and turning the knob counterclockwise scrolls display items toward the left.

When a desired menu item is highlighted, pushing the setup/enter knob inward will select that item. The lists of available beltpacks and groups typically span two or more screens, so when the highlight is at the leftmost or rightmost part of the screen and the user continues to turn the rotary encoder in that direction, the display will jump to the next screen selections (Example: in the beltpack sections, the first screen shows beltpacks 1 through 5, and the second shows 6 through 10.)

⑩ Power Switch

The power switch will turn the CEL-BASE base station on and off.

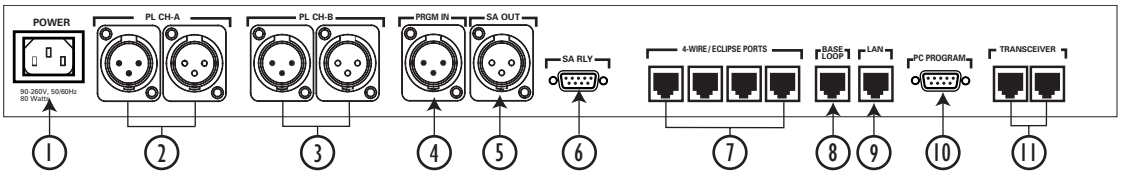
4 CONNECTING THE CELLCOM 10 BASE STATION

The CellCom 10 base station connects to several wired interfaces that can communicate with the wireless beltpacks.

The CellCom 10 base station connects to the following wired interfaces through its rear-panel connectors:

- Base station to AC power
- Base station to party-line channels A and B
- Base station to program audio source
- Base station to stage announce output
- Base station to stage announce relay
- Base station to 4-wire matrix ports
- Base station to a second base station
- Base station to a PC
- Base station to transceiver antennas

UNDERSTANDING THE BACK-PANEL CONNECTORS



1 Power Connector
2 Party Line Channel A Connectors
3 Party Line Channel B Connectors
4 Program Input
5 Stage Announce Output
6 Stage Announce Relay
7 4-Wire Matrix Ports
8 Base Loop Connector
9 LAN Connector
10 PC Connector
11 Transceiver Connectors

Figure 4-1: CellCom 10 Base Station Back Panel

(1) IEC Power Connector

The 3-conductor AC power connector and universal power supply accepts voltages from 90 to 250 volts, at 50/60 Hz. Power consumption is 80 watts.

② Party Line Channel A Connectors

The CellCom 10 base station provides two pairs of party-line connectors, labeled "Channel A" and "Channel B." Each pair of female and male 3-pin XLR connectors joins a channel of party-line intercom to the CellCom 10, allowing communication between the wired party-line equipment and CellCom 10 wireless beltpacks. Input and Output level control is set via the front-panel display programming.

The second connector of each pair is a loop-through, so that you can continue the connection to another CellCom 10 base station or to another party-line beltpack or station. This connector auto-detects a connection with a powered party-line channel (30-VDC on Pin 2), and the base's internal 200-ohm party-line termination and DC voltage to power PL beltpacks is not activated.

Alternatively, when a wired, unpowered party-line beltpack (up to four) is connected to PL CH-A with standard two-conductor shielded microphone cable, the base station engages the 200-ohm termination and supplies 24-VDC to the beltpack(s) – allowing them to operate and communicate with the wireless beltpacks in the system.

③ Party Line Channel B Connectors

These connectors are the same as those for PL CH-A.

④ Program Input Connector

This female 3-pin XLR connector accepts a line-level audio signal from an outside source such as a mixing console or audio player. It is transformer-isolated. Level adjustment is done via the front-panel display programming. The program input shares a time slot with the stage announce output, described below.

⑤ Stage Announce Output Connector

This male 3-pin XLR connector allows a line-level audio signal, typically a voice from a wireless beltpack user, to be sent to a paging system or other audio system. It is transformer-isolated. Level adjustment is done via the front-panel display programming. One beltpack at a time can access this output, and it must be programmed to a CEL-BP. It is activated by pushing the talk on the beltpack rotary encoder to which the SA Output is assigned.

⑥ Stage Announce Relay

This DB-9 male connector provides a relay closure that is triggered simultaneously with the SA Output. The relay may be used to open an audio pathway for the signal from the SA Output, or could also be used to activate a light or lock or some other device. The relay may be wired for normally closed or normally open operation, and the signal appears on pins 1 & 6 or 2 & 6. It is rated to a maximum of 30-VDC at 1 amp.

⑦ 4-Wire Matrix Ports

These four RJ-45 connectors can connect four full-duplex (input pair and output pair) audio connections from a 4-wire communications device, digital matrix intercom, or similar – making them available to the wireless beltpacks.

- The first two RJ-45's have both audio and data connections, to be used in the future for intelligent communications routing.
- The second two have audio connections only.

Each of these connectors has its own time slot, and can be addressed separately from a beltpack, or combined with other beltpacks and rear-panel connectors in a group. Level adjustment is done via the front-panel display programming.

⑧ Base Loop Connector

You use the base loop RJ-45 connector to join two CellCom 10 base stations to form one larger communications system, with up to 20 wireless beltpacks. The wired connection passes the digital audio signals and time slot data between the two bases. Point-to-point communication is possible from a CEL-BP wireless beltpack assigned to one base to a wireless beltpack assigned to the other base.

⑨ LAN Connector

This RJ-45 connector is used for rapid system software upgrades, and in the future will be used for intelligent connection with the Clear-Com Eclipse digital matrix systems, and for remote access to the CellCom 10 base. It is essentially a 10BaseT Ethernet port.

⑩ PC Connector

This female DB-9 connects to a PC computer for firmware updates and monitoring of the system configuration. It functions as a serial port.

⑪ Transceiver Connectors

These two RJ-45 connectors connect the base station to two remote CEL-TA transceiver/antennas or antenna splitters.

Each wired transceiver/antenna communicates with five wireless beltpacks. Each antenna splitter provides connection for five transceiver antennas. providing communication with up to a maximum of 10 beltpacks depending upon available bandwidth.

Note: To meet FCC emissions requirements, you must fit a ferrite on any CAT-5 cable plugged into either of the two ports labeled "tranceivers." The ferrite should be fitted at the base station end of the CAT-5 cable. Position the ferrite as close to the base station as possible.

The manufacturer of the ferrite is Wurth Elektronix. The part number is 742 711 32.

CONNECTING TO PARTY-LINE INTERCOM SYSTEMS

Up to two channels of party-line intercom can be connected to the CellCom 10 base station. The descriptions below will discuss connections with Clear-Com and compatible party-line, RTS party-line, the ability of CellCom 10 to power a few Clear-Com beltpacks by itself, and the front-panel settings associated with these party-line connections.

Using the front-panel display and rotary encoder, the user may go into the PORTS menu, select the desired party-line channel, and create a five-character alphanumeric label for it. This is the label that would then appear on any CellCom 10 wireless beltpacks to which that party-line connection was assigned for communications. In the GROUPS menu, the party-line connection can be assigned as a member of any of the groups, as desired.

CLEAR-COM AND COMPATIBLE PARTY-LINE

Clear-Com and Clear-Com-compatible wired party-line intercoms connect to the PL CH-A and PL CH-B connectors in a similar manner to connecting beltpacks or remote stations to the intercom line. Typically that wired intercom connection would have a 30-VDC current on Pin 2, coming from a main station or an intercom power supply. The second connector in the pair may be used as a loop-through to go to other wired party-line stations or beltpacks, or to a second CellCom 10 base station.

To connect party-line equipment to the base station:

1. Check that the party-line LED on the front-panel is out, which indicates that the party-line connection is disabled from the base station.
2. Connect, and if appropriate, power up, the external party-line equipment.
3. Enable the party line by pressing the “enable” button on the base station’s front panel.

The base station detects power and termination settings when you enable the party line by pressing the “enable” button on the base station’s front panel, or when the base station is powered up after having enabled the party line. The base station remembers that the party line is enabled when it powers up.

When the CellCom 10 base detects a wired party line being connected with 30 VDC on Pin 2, it automatically disables the 200-ohm termination on that connector, and also does not enable the 24-VDC power supply that the CellCom 10 base station supplies to the connector to support a handful of locally connected wired party-line beltpacks. The base station then appears to the wired party-line system as a remote station.

Note: *An audio tone of moderate level is injected into the party-line when it is enabled, to calibrate the auto-nulling circuitry. While this should not be of sufficient level to cause damage to persons or equipment, you may wish to disconnect or turn down audio outputs from the party-line equipment when powering on the base station, or enabling the base station party-line channel.*

The first call to a Party Line channel A or B results in the call alert and subsequent ones do not give any further alerting unless the Party Line channel

buttons on the base are toggled. This prevents all calls giving alerts when this is not necessary.

CONNECTING DIRECTLY TO CLEAR-COM PARTY-LINE BELTPACKS

PL CH-A and PL CH-B have the ability to directly support up to four Clear-Com RS-501 or RS-601 party-line beltpacks each, without any other connection to a wired party-line system. This feature gives the convenience of being able to add a few wired beltpacks when needed to a CellCom 10 installation.

Connect a standard two-conductor shielded microphone cable to the PL CH-A connector, and then connect it to a Clear-Com single-channel party-line beltpack. The base will detect that the beltpack has been connected, and will enable the required 200-ohm termination, and will supply 24-VDC to Pin 2 to power the beltpack(s).

You can daisy-chain up to four beltpacks, or use an intercom XLR splitter at the base to feed mic cables connected to the individual beltpacks. Because it is a 24-volt rather than a 30-volt current, the maximum length of cable that can be connected (the sum of all of the runs) will be shorter than what is expected with the standard party-line voltage. Do the same with PL CH-B to support an additional four beltpacks.

To connect to the party line:

1. From the main menu, scroll to PORTS and select by pressing the setup/enter knob in.
2. Scroll to PLCHA or PLCHB and press to select.

   The SELECTED PORT screen appears.
3. Scroll to and select CALLS.

   The CALL DESTINATION screen appears.
4. Select the port or group that you wish to connect the party line to by scrolling to it and pressing the rotary encoder. Doing so creates a route to the selected destination—this port or group can now hear the activity on the party line. (Note: you can also set this option to NONE.)
5. Select TYPE from the menu.
6. Select either Clear-Com, Drake, or RTS.

   The base station automatically sets the termination, audio levels, and call signaling options for the selected party-line system.
7. If you save your changes, the route will be reinstated on power up.

CONNECTING TO AN RTS™ WIRED BELTPACK

CellCom 10 can only transmit and receive audio from channel 2 of an RTS wired beltpack. Connect using a standard XLR cable. Ensure that you set the party-line type to “RTS” using the menu on the base unit before enabling the party line. See the chapter “Programming a System from the Base Station” for more information.

Warning: Previous versions of this manual described a cable which would allow you to access channel 1 of a dual channel RTS beltpack. DO NOT attempt to use a cable like this as it could result in damage to your CellCom 10 base unit.

FRONT-PANEL ADJUSTMENTS FOR PARTY-LINE CONNECTIONS

To connect the party-line channels to CellCom 10 and make the communication available to the rest of the system, press the CH-A and/or CH-B enable switches. The LED will light, and the connection is made. To disconnect the party-line connections, press these switches again. The switch may be "locked" in the SYSTEM menu so that the party lines may not be disconnected.

Because party-line intercom does not have global level control on a channel, input and output level controls are provided via the front panel programming. Scroll to PORTS on the main display screen and press the rotary encoder to select. Scroll to PLCHA or PLCHB and press to select. Select LEVELS, then select the input or output level. (This notation is relative to the base unit–input level refers to the level at which everyone else hears the party line, and output level refers to the level at which the users on the party line channel hear everyone else.) Use the rotary encoder to adjust the numerical level—clockwise to increase the level and counter-clockwise to decrease the level.

Make the estimated changes in level and press the rotary encoder to save the changes. Test the levels between the party line and CellCom 10 beltpack, and make additional changes as needed. When the levels are set as desired, press to select and the display will go to the previous INPUT/OUTPUT screen. When both are adjusted, select BACK on each screen until you return to the main screen.

Users connected to the base unit can be forced to listen to the activity on the party line by initiating a "call."

For more information on programming the base station, see the chapter "Programming a System from the Base Station."

CONNECTING TO 4-WIRE AND DIGITAL MATRIX INTERCOM

Up to four channels of 4-wire/digital matrix intercom can be connected to the CellCom 10 base. The descriptions below will discuss connections with Clear-Com Matrix Plus digital matrix, Clear-Com Eclipse digital matrix, other brands of digital matrix intercoms, other 4-wire audio devices, and the front-panel settings associated with these 4-wire connections.

To connect the base station to a matrix port:

1. Scroll to PORTS on the main display screen and press the rotary encoder to select.
2. Scroll to 4-WIRE and press to select.
3. Scroll to CALLS and press to select.
4. Select the port or group to which you wish to create an audio path and press to select. Doing so creates a route to the selected destination—this port or group

can now hear the activity on the party line. (Note: you can also set this option to NONE.)

5. Once the changes have been saved, the route will be reinstated on power up.

Note: Call signalling is not currently supported on 4-wire connections.

In the GROUPS menu, the 4-wire port can be assigned as a member of any of the groups, as desired.

CONNECTING WITH CLEAR-COM MATRIX PLUS

The connection between a Matrix Plus digital intercom port and a CellCom 10 4-wire port is accomplished with a standard 4-pair CAT-5 data cable with RJ-45 connectors on both ends. In the current generation of CellCom 10, the audio input and audio output pairs are all that will be used.

In the Matrix Plus PGM-WIN configuration software, set the matrix port that is connected to the CEL-BASE base station 4-wire port to "4-Wire." If you will be putting the label of this CellCom 10 4-wire port onto more than one intercom panel within the matrix system, and you want to allow any and all people who have activated a talk/listen to that port to be able to hear each other, as well as hearing the person talking to them from the CellCom 10 wireless beltpack, also check "Party-Line Enable" for that 4-Wire connection in the configuration software.

Within the CellCom-10 Base Station configuration software, the user can adjust the input and output level for that port. Alternately, the input and output levels can be adjusted on the CellCom 10 base for the particular 4-wire port, using the front-panel display. Repeat the procedure for each CellCom 10 4-wire port that is connected with the Matrix Plus system. Note that CellCom 10 does not currently generate a call signal to the Matrix port.

CONNECTING WITH CLEAR-COM ECLIPSE DIGITAL MATRIX

The procedure to connect between a CellCom 10 4-wire port and the Eclipse digital matrix is similar to that of Matrix Plus 3. An identical connection is made with 4-pair CAT-5 cable between an Eclipse port and the CellCom 10 port.

Within the Eclipse Configuration System software (ECS), set the port to "Direct." This will allow intercom stations in the Eclipse system to converse with the CellCom 10 base and beltpacks. Because there is not a "Party-Line Enable" within Eclipse, if several users of intercom stations connected with Eclipse need to hear each other as well as the wireless CellCom 10 beltpack, another procedure will need to be added. Within the configuration software, the user would create a new party-line label, with members including the desired intercom stations and the particular CellCom 10 4-wire port. That label would then be assigned to a key on each of the intercom stations, allowing connection with the CellCom 10 4-wire port and the other members of the new party-line.

Within the CellCom-10 Base Station configuration software, the user can adjust the input and output level for that port. Alternately, the input and output levels can be adjusted on the CellCom 10 base for the particular 4-wire port, using the

front-panel display. Repeat the procedure for each CellCom 10 4-wire port that is connected with the Eclipse system.

CONNECTING WITH OTHER DIGITAL MATRIX INTERCOM SYSTEMS

Because CellCom 10 features standard 4-wire ports, with an input pair and an output pair, virtually any 4-wire signal can be connected with it. Make sure to properly match the input and output pairs between the digital matrix port and the CellCom 10 4-wire port (see diagram below).

The pinouts for the first two 4-wire ports contain both audio and data connections, though the data connections are not currently used. Those pinouts are shown in the following table.

PIN	FUNCTION
1	Data Tx+
2	Data Tx–
3	Audio Out+
4	Audio In+
5	Audio In–
6	Audio Out–
7	Data Rx+
8	Data Rx–

Table 4-1: Pinouts for Connecting to Other Digital Matrix Intercom Systems

The remaining two 4-wire connections are audio only, and the data connections are unterminated.

Within the configuration software of the other digital intercom system, configure its connected port to 4-wire or similar. Adjust the input and output levels either at matrix side or within the CellCom 10 front-panel display for the particular CellCom 10 4-wire port.

CONNECTING WITH OTHER 4-WIRE DEVICES

Various other 4-wire audio devices can be connected with CellCom 10. The Clear-Com EF-1M 4-wire interface can be used to attach additional party-line channels to CellCom 10, converting them from party-line on the wired side to 4-wire on the CellCom 10 side.

The Clear-Com IF4-B interface can be used similarly. The audio input side of the CellCom 10 4-wire connectors could be used for additional program or other audio inputs that could then be accessed by CellCom 10 beltpacks. The audio output side of the CellCom 10 4-wire connectors could be used to route a CellCom 10 wireless beltpack user's voice out of the system for paging or other reasons, similar to the SA OUT connector.

When using the CellCom 10 4-wire ports in this way, make sure that proper connections are made between CellCom 10 and the other device. Adjust the input and/or output levels either at the 4-wire device or within the CellCom 10 front-panel display for that particular 4-wire port.

CONNECTING TO A PROGRAM AUDIO SOURCE

CellCom 10 can connect with a program audio source, making it accessible to be assigned by itself to a communication path to one or more CEL-BP wireless beltpacks, or to be added to a group with other communications and assigned to beltpacks. Using the two separate rotary encoder volume controls on the beltpack, you can monitor the program on one control while talking and listening on an intercom channel with the other.

The balanced female 3-pin XLR connector accepts a standard audio signal from a mixing console or similar, with Pin 1 ground, Pin 2 audio hot (+), and Pin 3 audio cold (-).This connector is transformer-isolated.

To make the program input signal available to the system, the front-panel PRGM enable button must be pushed. The red LED above it will light, indicating that it is now available. This front-panel switch may be “locked” to prevent accidental disengagement, using the front panel display.

Using the front-panel display and rotary encoder, you may select PORTS and give the connector a five-character alphanumeric label. You may assign that program input by itself to a beltpack using the BELTPACKS menu, or use the GROUPS menu to assign the program input to any group.

CONNECTING TO THE STAGE ANNOUNCE OUTPUT

The stage announce feature allows a CEL-BP wireless beltpack user to route their voice to an external paging system or other audio destination by pressing one of the rotary encoders to which the SA OUT connector is assigned. The adjacent SA RELAY is simultaneously triggered. One beltpack user at a time may use this feature, though the capability may be assigned to any or all of the wireless beltpacks, as desired.

Connect a microphone cable to the male 3-pin XLR connector on the rear of the CellCom 10 base station, and connect the other end to the external audio system. When the output is activated, the beltpack user’s voice will be sent at line level to the audio system. The audio output ceases when the beltpack user stops pressing the rotary encoder; it is good practice to make sure that any rotary encoder to which the SA OUT is assigned is set to momentary/non-latching mode.

PIN	FUNCTION
1	Normally Closed
2	Normally Open
3	N/C (no connection)
4	N/C
5	N/C
6	Pole
7	N/C
8	N/C
9	N/C

Table 4-2: Pin Assignments for Stage Announce Connector

The associated SA RELAY can be assigned to open an audio route for the paging or announcement, or can be assigned to initiate any other event such as turning on a light or activating a lock. It is rated at a maximum of 30 VDC at 1 ampere. The relay can be wired to be either normally open or normally closed, using the pinout information in Table 2.

CONNECTING TO A PC

CONNECTING VIA THE SERIAL PORT

The PC serial port on the rear of the CellCom 10 base station is mainly used for firmware version upgrades of the system.

A specially wired cable is required for these updates, consisting of two 9-pin D-type connectors for the PC and the CellCom 10 ends. On the CellCom 10 end, a male 9-pin D connector is used, and is wired as follows in relation to the D connector pins on the PC end. Pin 2 goes to pin 3, pin 3 goes to pin 2, and pin 5 goes to pin 5; in other words, the data Tx and Rx lines on pins 2 and 3 are reversed. Those are the only wiring connections on the CellCom 10 end of the cable.

PC CONNECTION (9-PIN F)	BASE STATION (9-PIN M)
1	N/C
2	3
3	2
4	N/C
5	5
6	N/C
7	N/C
8	N/C
9	N/C

Table 4-3: Pinout for Cable to Upgrade Base Station Firmware

On the PC end, a female 9-pin D connector is used. Make sure that the data connections of pin 2 to pin 3 and pin 3 to pin 2 are followed, and that pin 5 goes through to pin 5. Then short pins 1, 4, 6, and 8 together on the PC end of the cable. The cable will now be ready to use with the any upgrade files from the factory. Table 3 gives the pin configuration for this cable. Table 4 shows the pin configuration for the cable used to upgrade beltpack firmware.

PC CONNECTION (9-PIN F)	BELTPACK (3.5 mm jack)
1	N/C
2	tip
3	ring
4	N/C
5	screen
6	N/C
7	N/C

PC CONNECTION (9-PIN F)	BELTPACK (3.5 mm jack)
8	N/C
9	N/C

Table 4-4: Pinout for Cable to Upgrade Beltpack Firmware

CONNECTING VIA THE LAN PORT

This connection is used for rapid firmware updates, as well as in the future for system configuration and intelligent connection with the Eclipse digital matrix. It is wired as a standard Ethernet connection.

The base station has a fixed IP address. You can find this by selecting SYSTEM and then INFO from the front-panel display menu. Refer to the chapter "*CellCom Toolkit"* for more information on using the LAN port to upgrade firmware.

LINKING TWO BASE STATIONS TO FORM LARGER SYSTEMS

Two CellCom 10 base stations may be joined via the rear-panel BASE LOOP connection to create larger communications systems that will support up to 20 wireless beltpacks, plus all of the available rear-panel connected devices on both bases. The labels on each base are available to the other base, groups may be created and assigned that contain beltpacks and rear-panel inputs from both bases, and point-to-point conversations between beltpacks registered with the two different bases are possible.

The one limitation to this expanded system is that the CEL-TA transceiver/antennas connected to "Base #1" will only communicate with the CEL-BP wireless beltpacks registered with "Base #1." So some care will need to be taken when assigning particular beltpacks to locations and users in the production area to most efficiently use the transceiver/antennas.

Use a specially wired four-pair CAT-5 data cable to connect the BASE LOOP connectors on the two bases together. *This cable must have a maximum length of 1 meter (3 feet)*. The pinouts of this cable are shown in the following table.

PIN	FUNCTION
1	Tx+ to Pin 3 Rx+
2	Tx– to Pin 6 Rx–
3	Rx+ to Pin 1 Tx+
4	Clk+ to Pin 4 Clk+
5	Clk– to Pin 5 Clk–
6	Rx– to Pin 2 Tx–
7	Dectsync+ to Pin 7 Dectsync+
8	Dectsync– to Pin 8 Dectsync–

Table 4-5: Pin Assignments for Base Loop Connectors

CONNECTING TO TRANSCEIVER/ANTENNAS (CEL-TA)

CONNECTING ONE TRANSCEIVER/ANTENNA (CEL-TA) DIRECTLY TO A TRANSCEIVER PORT

A CEL-TA transceiver/antenna connects to the transceiver port on the CellCom 10 base station using a standard 4-pair CAT-5 data cable with RJ-45 connectors. It may be located up to 1,000 meters from the base station if 24AWG cable is used or 500 meters if 26AWG cable is used, creating a coverage area for five CEL-BP wireless beltpacks in that location. The port is able to provide the required power to the transceiver/antenna at a distance of up to 300 meters (approximately 900 feet); beyond that distance, the CEL-TA transceiver/antenna must be locally powered via its in-line external universal power supply.

To know that a CEL-TA transceiver/antenna is active, observe the green power LED and the yellow signal LED on the face of the unit where the RJ-45 connector is connected. Both must be lit. Also, wireless beltpacks in the vicinity of the active transceiver/antenna will be connected to the system and their displays will show labels and other information.

Using both transceiver ports, a base station may be connected with up to two transceiver/antennas via a direct connection with the base. For the best, most reliable coverage, it is advisable to use a minimum of two transceiver/antennas in any installation, positioned in different locations in the coverage area. When more CEL-TA's are required to support a larger coverage area or more wireless beltpacks, an antenna splitter will need to be introduced between the base station and the transceiver/antennas.

Note: In some situations, particularly in outdoor venues, interference from non-DECT sources can severely reduce the range of the system. In these cases we recommend a site survey as described in Chapter 8, "Installing a System."

CONNECTING TRANSCEIVER/ANTENNAS WITH A SPLITTER (CEL-SP)

A splitter (CEL-SP) will connect up to five transceiver/antennas to one of the transceiver ports on the CellCom 10 base station, creating up to five coverage zones that can be overlapped to make large areas where CEL-BP wireless beltpacks can have continuous coverage. The use of the splitter also extends the distance that the CEL-TA transceiver antennas can be located from the base to 2,000 meters (6,400 feet) if 24AWG cable is used or 1,000 meters (3,200 feet) if 26AWG cable is used (assuming the same cable type is used to connect the antenna to the splitter and the splitter to the base station).

For example, a splitter can be used to connect to a CellCom 10 base that is located in a production truck outside an arena or stadium, with a single CAT-5 cable going to the splitter which is then located just inside the stadium. From that splitter, up to five CEL-TA transceiver/antennas are distributed throughout the stadium to create wide coverage – each with a run of CAT-5 cable back to the splitter. A similar arrangement may be used in a large theatre or performing arts facility.

The connection between a transceiver port on the CellCom 10 base station and a CEL-SP splitter is accomplished with standard 4-pair CAT-5 data cable with RJ-45 connectors. It is connected to the port labeled MATRIX on the splitter. This cable can be as long as 1,000 meters (3,200 feet) if 24AWG cable is used or 500 meters (1,600 feet) if 26AWG cable is used. The splitter must be locally powered via its DC IN connector, using the in-line external universal power supply. The RJ-45 ports on the splitter labeled “1” through “5” are the connections to the CEL-TA transceiver/antennas. Transceiver/antennas connected to the splitter can be powered at a distance of up to 300 meters (900 feet); beyond that distance they will need to be locally powered.

Note: To use the system with cable lengths over 200m the software update in release 1.5.6 or better must be installed on the base stations.

POWERING AN ANTENNA OR ANTENNA SPLITTER

You provide 24 VDC power to a CellCom 10 antenna in one of three ways:

- Connect the antenna to a 150/UNI-DIN power supply unit through the 4-pin DIN connector at the antenna.
- Connect the antenna to an antenna splitter which is powered by a power-supply unit.
- Connect the antenna to a CellCom 10 base station’s “transceiver” RJ-45 connector.

The preferred method is to connect the antenna to a powered antenna splitter, as illustrated in Figure 4-2. An antenna splitter distributes power to all antennas connected to it. A single power-supply unit can power the maximum 10 antennas. However, cable lengths will be reduced.

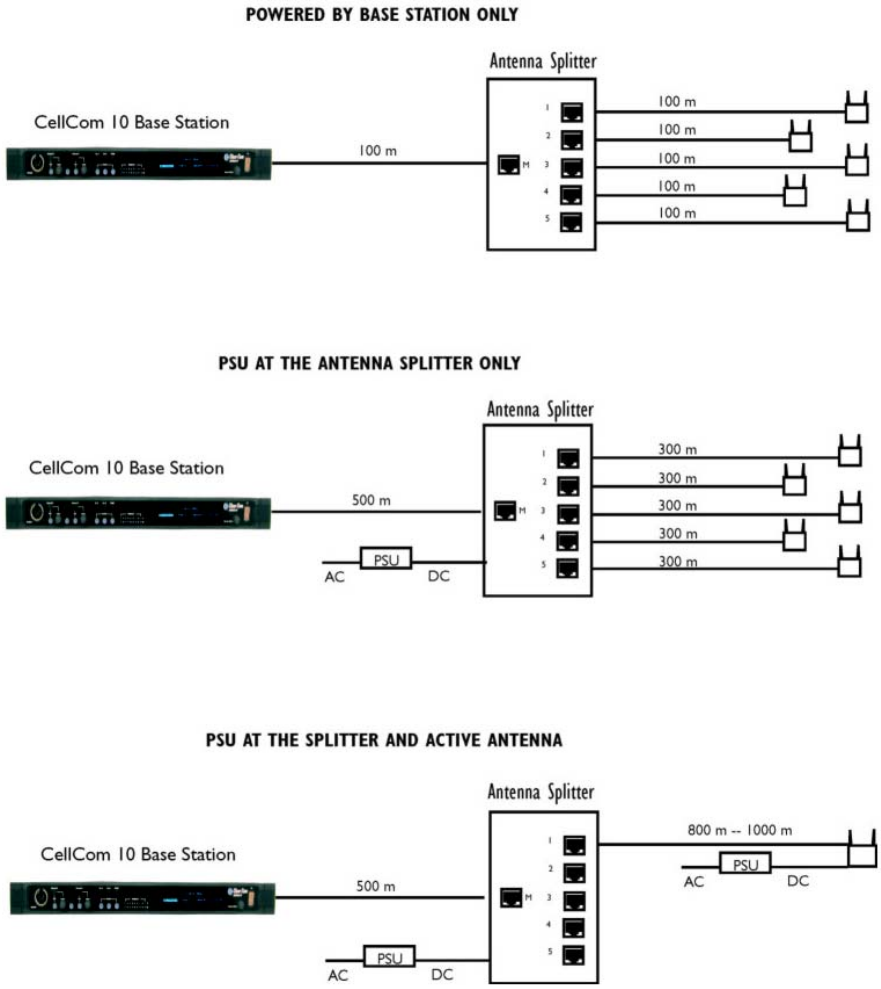


Figure 4-2: Powering an Antenna Splitter

5 PROGRAMMING A SYSTEM FROM THE BASE STATION

You program a system using the menus displayed on the base station's front panel.

You program a CellCom 10 system using the menus displayed on the base station's front panel. Programming the system requires four basic steps:

1. **Create individual names ("labels") for the wireless beltpacks and for the wired devices connected to the base station**. You use individual labels for building "point-to-point" communication paths.

   Labels are composed of five alphanumeric characters. You can create labels for users' names ("John" or "Susan"), roles ("AUDIO" or "DIR"), or for connections ("PL_A" or "PL_B").

   Alternatively, you can use a device's generic name, which never changes. An example of a generic name is "BPK01" for Beltpack 1. Generic names are always displayed on the programming menus.

Scroll to an item by turning the setup/enter knob. Select an item by pressing the knob in, as if it were a pushbutton.

2. **Create names ("labels") for groups**. You use a group label when a CellCom beltpack needs to communicate with all members of a group simultaneously, as in a party line. You can create up to ten groups, with as many members as desired.

   You can customize a label to reflect the group's function, such as "STG-A" for communicating with the production staff on Stage A.

   Alternatively, you can use the generic names assigned for the ten possible groups. For example, "GP#01" is the generic name for Group 1.

3. **Assign members to the groups you have created.** Group members are drawn from the wireless beltpacks and from the wired devices connected to the base station. A group created from these devices functions as a party line, in which all members of the group can communicate simultaneously with all other members of the group.

4. **Assign individual and grouped devices to each CellCom beltpack by using the programming screens on the base station's front panel.** Each assignment creates a communication route from the CellCom beltpack to the selected device or group. You can assign up to six communication routes to a beltpack.

These steps are discussed in more detail in the following sections.

A NOTE ABOUT TERMINOLOGY

In this manual, the term "source" refers to a device—beltpack, intercom station, or a variety of other devices—that sends audio to your beltpack. It represents a "listen" path to your station. The term "destination" refers to a device to which you send audio. It represents a "talk" path from your beltpack.

The names of these sources and destinations appear in the display of your beltpack and are called "labels." A label is a 5-character alphanumeric name that

identifies a source, destination, or control function accessed by your beltpack. You program these "labels" from the CellCom 10 base station.

USING THE BASE STATION'S PROGRAMMING MENUS

You program a CellCom 10 system using the programming menus that appear on the base station's front-panel display screen. You navigate through the menus to select programming options for the system.

"Source" refers to a device—beltpack, intercom station, or a variety of other devices—from which you receive audio.

Rotating the setup/enter knob allows you to scroll through the selections on the screen. As you scroll, menu items are highlighted on the screen. To select an item as a new programming option, press the setup/enter knob in, as if it were a pushbutton, when the desired item is highlighted on the screen.

SAVING CHANGES

Your changes are saved and applied automatically when you make a change to the unit's programming. Five seconds after the last time you press or turn the setup/enter knob, the front-panel display flashes to indicate that the changes are being saved and applied.

"Destination" refers to a device to which you send audio.

CREATING BELTPACK LABELS

The first step in creating a CellCom 10 system is to create individual names ("labels") for the wireless beltpacks and for the wired devices connected to the base station. You use individual labels for building "point-to-point" communication routes.

There are two ways to save changes.

To create a beltpack label:

1. From the MAIN menu on the base station's front panel display, scroll to and select BELTPACKS, as shown in Figure 5-1.

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Figure 5-1: From the MAIN menu, select BELTPACKS

The AVAILABLE BELTPACKS menu appears, as shown in Figure 5-2. The first page shows the first five beltpack labels.

You use individual labels for point-to-point communication routes.

Figure 5-2: From the AVAILABLE BELTPACKS menu, select a beltpack

- The beltpacks' generic labels BPK01 through BPK05 appear on the upper row, while the labels you give the beltpacks appear just under the generic labels. At first both upper and lower labels will have the same generic designations.
- To get to the second page, scroll all the way to the right of the screen, and then continue to scroll. The second page, showing beltpack labels 6 through 10 (BPK06 through BPK10) appears.

2. Scroll to and select the desired beltpack label.

   The next menu that appears gives you options for programming the selected beltpack, as shown in Figure 5-3.

Figure 5-3: Select LABEL from the PROGRAMMING OPTIONS menu

3. Scroll to and select LABEL from the menu.

   A menu to edit the selected beltpack's label appears, as shown in Figure 5-4. The current 5-character label appears, just under its generic name.

Figure 5-4: Editing a Beltpack's Label

4. Scroll to and select the alphanumeric character you wish to change. A box appears around the character.
5. Rotate the setup/enter knob. As you do so, the entire range of available characters appears, starting with upper-case characters, proceeding to lower-case characters, then to digits, and finally to punctuation characters.
6. When the desired new character appears, press the setup/enter knob to select it. The box disappears, and is replaced by the solid highlight.

7. Repeat steps 4 through 6 for all the characters in the label that you wish to change.
8. When you have completed editing the label, select and then de-select the fifth character to return to the PROGRAMMING OPTIONS menu.

   Note: You must select the fifth character, even if it is blank, as in a label with less than five characters.

Port labels identify the devices wired to the base station's rear panel ports.

9. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

If you wish to edit another beltpack label, scroll clockwise to the BACK command and select it. The AVAILABLE BELTPACKS screen appears. Select a new beltpack label to edit, and repeat steps 2 through 9.

CREATING PORT LABELS

You create port labels to identify the audio devices wired to the base station's rear panel ports, such as party-line beltpacks, 4-wire devices, program sources, and stage-announce outputs and relays.

Audio ports include headset, 4-wire, party line, stage announce, and program source labels.

To create a port label:

1. From the base station's MAIN menu, scroll to and select PORTS (see Figure 5-5). The AVAILABLE AUDIO PORTS menu appears, as shown in Figure 5-6.

Figure 5-5: Select "Ports" from the Main Menu

Figure 5-6: Select a port from the AVAILABLE AUDIO PORTS menu

The first page of the menu shows the first 5 ports, starting with HDSTA (front-panel headset A) and continuing through 4WIR3 (the third 4-wire connector on the rear panel), as shown in Figure 5-6.

By scrolling all the way to the right, and then continuing to scroll, 4WIR4 through STGAN (stage announce) will appear.

Note: The upper character of the pair is a generic label, while the lower character is editable.

2. Select an audio port from the menu. A screen appears that gives you options for programming the selected port, as shown in Figure 5-7.

Figure 5-7: Select LABEL from the PROGRAMMING OPTIONS menu

The upper label retains the same generic label, while you can edit the lower label to your requirements.

3. Select LABEL from the menu.

   A menu to edit that port's label appears as shown in Figure 5-8.

Figure 5-8: Editing a Port's Label

4. Scroll to and select the alphanumeric character you wish to change. A box appears around the character.
5. Rotate the setup/enter knob. As you do so, the entire range of available characters appears, starting with upper-case characters, proceeding to lower-case characters, then to digits, and finally to punctuation characters.
6. When the desired new character appears, press the setup/enter knob to select it. The box disappears, and is replaced by the solid highlight.
7. Repeat steps 4 through 6 for all the characters in the label that you wish to change.
8. When you have completed editing the label, select and then de-select the fifth character to return to the PROGRAMMING OPTIONS menu.

   Note: You must select the fifth character, even if it is blank, as in a label with less than five characters.

9. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

If you wish to edit another port label, scroll clockwise to the BACK command and select it. The AVAILABLE AUDIO PORTS menu appears. Select a new audio port to edit, and repeat steps 2 through 9.

CREATING GROUP LABELS

You use a group label when a CellCom beltpack needs to communicate with all members of a group simultaneously, as in a party line. You can create up to ten groups, with as many members as desired.

Group members can be individual beltpacks or wired devices connected to the base station. To form a group, you must first create a name or "label" for the group, and then assign members to the group.

To create a group label:

First you create a group label, and then add members to the group.

1. From the main menu, select GROUPS. The AVAILABLE GROUPS menu appears, as shown in Figure 5-9.

   The first 5 of 10 available group labels appears on the first page of the menu. The generic labels GP#01 through GP#05 appear on the top row, and their editable versions appear on the lower row.

   By scrolling all the way to the right, and then continuing to scroll, GP#06 through GP#10 appear on the second page of the menu.

Figure 5-9: Select a group label from the AVAILABLE GROUPS menu

2. From the AVAILABLE GROUPS menu, select a group label. A menu appears that gives you options for programming the selected group, as in Figure 5-10.

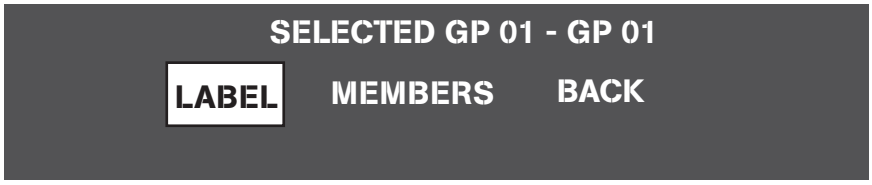


Figure 5-10: Select Label from the Menu

3. Select LABEL from the menu.

   A menu to edit that group label appears, as shown in Figure 5-11.

Figure 5-11: A menu for editing the selected group appears

4. Scroll to and select the alphanumeric character you wish to change. A box appears around the character.
5. Rotate the setup/enter knob. As you do so, the entire range of available characters appears, starting with upper-case characters, proceeding to lower-case characters, then to digits, and finally to punctuation characters.
6. When the desired new character appears, press the setup/enter knob to select it. The box disappears, and is replaced by the solid highlight.
7. Repeat steps 4 through 6 for all the characters in the label that you wish to change.
8. When you have completed editing the label, select and then de-select the fifth character to return to the previous menu.

   Note: You must select the fifth character, even if it is blank, as in a label with less than five characters.

9. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

If you wish to edit another group label, scroll clockwise to the BACK command and select it. The AVAILABLE GROUPS menu appears. Select a new group label to edit, and repeat steps 2 through 9.

ADDING GROUP MEMBERS

When you have chosen a group name or "label," you may then "populate" that group. Group members are drawn from the individual wireless beltpacks and individual wired devices connected to the CellCom base station. A group created from these devices functions as a party line, in which all members of the group can communicate simultaneously with all other members of the group.

To assign members to a group:

1. From the MAIN menu, select GROUPS. The AVAILABLE GROUPS menu appears.
2. Select a group's label to which you wish to add members. The PROGRAMMING OPTIONS menu appears, as shown in Figure 5-12.

Figure 5-12: Select MEMBERS from the PROGRAMMING OPTIONS menu

3. Select MEMBERS from the menu.

   The MEMBERS menu appears, as shown in Figure 5-13. On this set of pages, all of the base-station wired ports appear (HDSTA through STGAN, "headset A" through "stage announce"), followed by the labels for all ten CellCom 10 beltpacks.

Figure 5-13: Adding Members to a Group

4. Scroll through the pages of this list to find the desired members for the group. When a desired member is highlighted, press the setup/enter knob to select that member. A box appears around it.
5. To de-select a member that has already been selected, highlight that member and press the setup/enter knob. Pressing the setup/enter knob effectively works as a toggle switch, first selecting the item by putting a box around it, and then de-selecting it and removing the box.
6. When you have selected all of the desired beltpack labels and base-station port labels, scroll clockwise to BACK and select it to exit the selection process. Continue selecting the BACK command until you reach the desired screen.
7. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

To edit a group that already has members, go through the procedure above to reach the member labels. Scroll through the list, using presses of the rotary encoder to select and de-select members. Exit as above, and save the changes in the system memory.

ASSIGNING LABELS TO BELTPACKS KEYS

You have completed the following steps in setting up the system:

- Created names ("labels") for the CellCom beltpacks and for the devices wired to the base-station's rear panel
- Created names ("labels") for communication groups and assigned members to the each group.

The next step is to assign these communication routes to the individual CellCom beltpacks.

For this example, communication routes are assigned to the beltpack in position one—BPK01. The procedure is identical for all remaining beltpacks.

To assign talk and listen routes ("labels") to a beltpack's keys:

1. From the MAIN menu, select BELTPACKS.

   The AVAILABLE BELTPACKS screen appears.
2. Select the beltpack to which you wish to assign labels. The PROGRAMMING OPTIONS screen appears.
3. Select KEYS. The KEY EDITING screen appears, as shown in Figure 5-14.

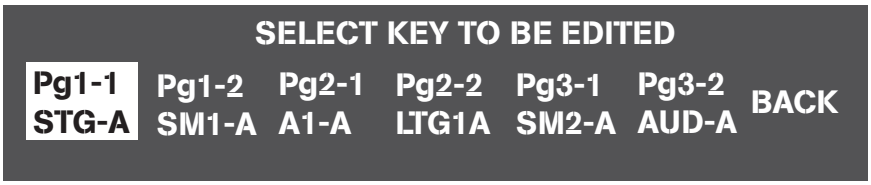


Figure 5-14: Assign communication routes ("labels") to a beltpack key

You can assign six communications routes ("labels") to a CellCom beltpack:

- Page 1 of the beltpack's display screen shows the first assignments for the Talk A and Talk B knobs (2 assignments).
- Page two shows the next set of assignments for the Talk A and Talk B knobs (2 assignments).
- Page three shows the next set of assignments for the Talk A and Talk B knobs (2 assignments).

Each beltpack can accommodate six labels.

Each of the beltpack's three pages shows two labels.

Figure 5-15 shows how the front-panel screen on a beltpack displays its six communications routes.

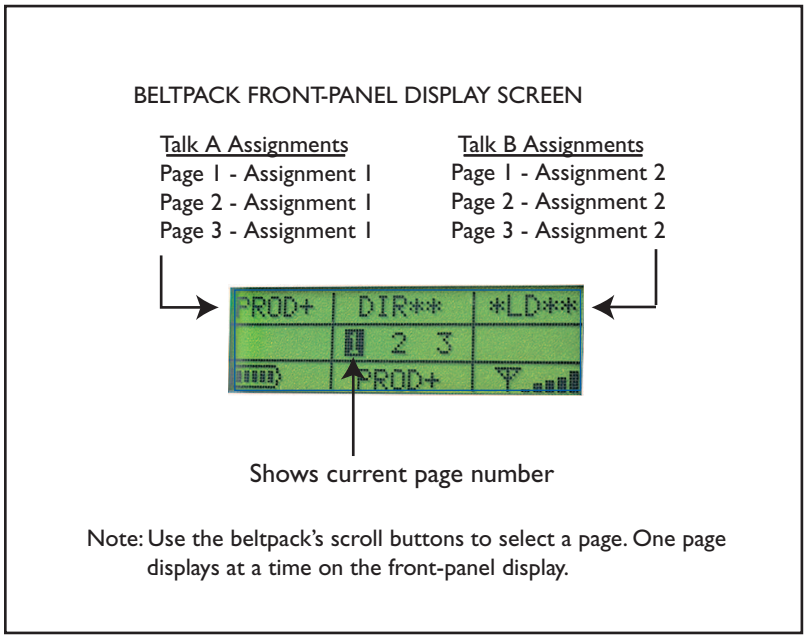


Figure 5-15: How a Beltpack Displays its Six Communication Routes ("Labels")

4. Select the beltpack key to which you want to assign a communication route. For this example, it is the beltpack's Talk A key, page 1.

   A screen appears with a list of available sources and destinations to assign to this key. The list starts with the base-station 4-wire and party line connections, followed by each of the ten individual beltpacks, and finally by the ten available groups.

Figure 5-16: Select the source/destination to assign to that beltpack key

5. Scroll through the list and select the desired source or destination to assign to that beltpack key. A box appears around your selection and the next screen appears for assigning the key type.
6. Select either talk, listen, talk/listen, dual talk/listen, forced listen or talk/forced listen for that key.

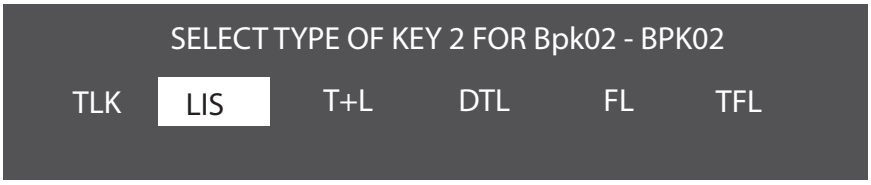


Figure 5-17: Key Type Menu

The display automatically returns to the screen for selecting the next key to program.

7. Select the next key and follow steps 4 through 6. Continue until you have assigned sources and destination to all desired keys on that beltpack.

If you wish to assign keys for another beltpack, continue selecting the BACK command on each successive screen until you reach the AVAILABLE BELTPACKS menu. Highlight and select the next beltpack, and repeat the above procedures.

SETTING INPUT AND OUTPUT AUDIO LEVELS

The settings at the base station determine the input and output audio levels of a device connected to a port. You can adjust the levels from -20 to +18 dB.

- Setting the “input” level alters how loudly others will hear it.
- Setting the “output” level alters how loudly the user will hear other audio sources.

To set the audio level for a port:

1. From the MAIN menu, select PORTS.
2. Select the port for which you wish to adjust audio levels from the AVAILABLE AUDIO PORTS menu.

   The SELECTED PORT menu appears.
3. Select LEVELS from the next menu.

The EDITING LEVELS menu appears.

4. Select either Input level or Output level.
5. Rotate the setup/enter knob clockwise or counterclockwise to increase or decrease the level in 1 dB increments.
6. When the desired audio level appears on the screen, press and release the setup/enter knob to select it,
7. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and appied.

In some cases, the audio paths must be re-made before the changes will take effect.

SELECTING PARTY LINE TYPE

Before enabling a party line from the base station's front panel, you must tell the base station the type of party line so that it can set the proper termination, gain level, and call signalling for that system.

The three types of party line systems are: Clear-Com, Drake, and RTS.

To select the type of party-line system for a party-line port:

1. Select PORTS from the main menu, then select PLCHA or PLCHB from the AVAILABLE AUDIO port menu which appears.
2. Select TYPE.

   The TYPE OF PORT menu appears.
3. Select either Clear-Com, Drake, or RTS. Your changes are saved and applied automatically five seconds after the last time you press or turn the setup/enter knob. The front-panel display flashes to indicate that the changes are being saved and applied.

   The base station automatically sets the port's termination, gain, and call signalling options for the selected party line type.

BASE STATION SYSTEM MENU

The base station SYSTEM menu offers several system-wide capabilities, including giving you information on firmware, DECT system ID, IP address, and active antenna status, in addition to setting overall system gain, locking the front-panel enable buttons, and restoring the most recent downloaded configuration.

From the MAIN menu, select SYSTEM. The SYSTEM menu appears as shown in Figure 5-18.

SYSTEM MENU

INFO DFLTS GAIN ANTNS IP LOCK BACK

Figure 5-18: System Menu

The following sections describe the items on this menu.

SYSTEM INFO ("INFO")

When you select INFO, the screen displays the system's current firmware version, DECT system ID (for registering beltpacks), and if applicable, IP address.

BUILD: APR132007 15:27:24 V1.6.6.115
SYSTEMID: 100EC012 (B12) IPADDRESS: 129 67 61 36
CARRIERS: 0000 000300 RAM: 8MB
COPYRIGHT 2004-2006 VITEC GROUP COMMUNICATIONS

Figure 5-19: System Info Menu

To return to the SYSTEM menu, press the setup/enter button.

RESTORING THE DEFAULTS ("DFLTS")

When you select DFLTS, a screen appears asking if you want to restore the last configuration downloaded with the serial cable. Select either yes or no.

RESET TO LAST DOWNLOAD MAP - Sure?

NO YES

Figure 5-20: Restore Defaults Menu

SETTING SYSTEM GAIN ("GAIN")

When you select GAIN, a screen appears giving you two choices: to restore gain to normal, or increase it by +3 dB. The levels range from 0 to 3 dB.

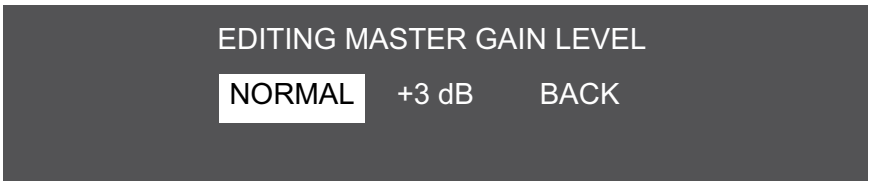


Figure 5-21: GAIN Setup Menu

ANTENNAS ("ANTNS")

When you select ANTNS, the display shows the status of the active antennas that are connected to the base station, and shows the slots on each antenna that are occupied by beltpacks. This information may be useful during a site survey, or when troubleshooting coverage areas or antenna connections.

A typical display is shown below:

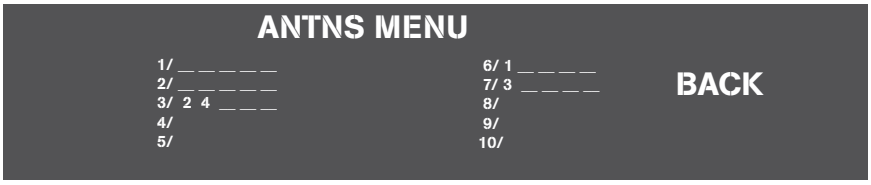


Figure 5-22: ANTNS menu

The numbers 1 through 10 represent the maximum number of antennas that can be connected to the base station. Numbers 1 through 5 can be positions on a splitter connected to transceiver port 1, while 6 through 10 can be positions on a splitter connected to transceiver port 2. An antenna connected directly to transceiver port 2 would appear at position 6.

"__" indicates an empty slot on an acive antenna that is connected to the base station. A number in place of a "__" indicates that this slot is occupied by the indicated beltpack.

Blank spaces next to an antenna number indicate that no antenna has been detected in this position.

So, for example, the above display would indicate that five antennas are connected to the base station in positions 1, 2, 3, 6, and 7. There are no active antennas in positions 4, 5, 8, 9, and 10.

There are 4 beltpacks currently connected. Beltpacks 2 and 4 occupy the first 2 slots of antenna 3; beltpack 1 occupies the first slot of antenna 6; and beltpack 3 occupies the first slot of antenna 7.

The display updates every 4 seconds to reflect changes in antenna status and beltpack connections.

Rotate or push in the setup/enter knob to exit this menu.

SETTING THE IP ADRRESS ("IP")

When you select IP, a screen appears allowing you to set the IP address of the base station.

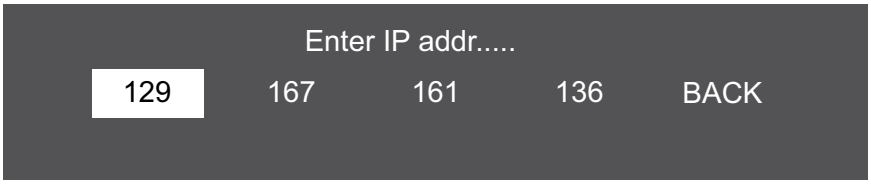


Figure 5-23: IP Address Menu

You may change the IP address by use of the Enter/Setup rotary encoder. The current part of the IP address that will be changed is highlighted and slowly rotating the encoder increases the IP address in increments of 1 per step whilst rapidly rotating the encoder increases the IP address in increments of 10 per step. When the required value is set press the encoder to confirm it and then rotate the encoder one step to select the next part of the IP address and repeat the procedure.

When the required IP address has been set select 'BACK' to save the IP address and exit the menu.

To exit without saving any changes to the IP address allow the menu to timeout (about 30 seconds).

LOCKING FRONT-PANEL ENABLE BUTTONS ("LOCK")

When you select LOCK, a menu appears that allows you to lock the front-panel enable buttons for party-line channel A, party-line channel B, and the wired program source.

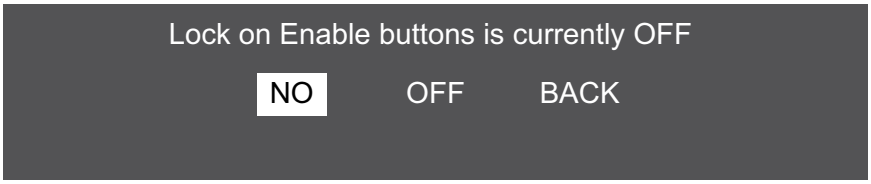


Figure 5-24: Lock Enable Menu

Selecting ON for the lock maintains whatever state the buttons are in when you lock them. That state is maintained even when the base station is turned off and re-started. You can lock the buttons either in the enabled or disabled position, in any desired combination.

Selecting OFF allows the buttons to be toggled on and off with a single push.

6 OPERATING THE CELLCOM 10 WIRELESS BELTPACK

OVERVIEW OF THE WIRELESS BELPACK

You can access six separate audio routes from a beltpack.

Depress the channel A or B talk button to select an audio route. Turn the button to adjust volume.

Figure 6-1: Overview of Beltpack Functions

A CellCom 10 wireless beltpack gives you simultaneous access to six channels of talk/listen communication, with the ability to switch among them as desired. Any or all of these six routes may be kept open during use. Incoming volume levels ("listen levels") may be individually adjusted using the two push-to-talk knobs, so that one conversation can be monitored in the background while a primary conversation is held.

The front-panel display contains the name (label) of the beltpack user, identifies the two talk/listen labels currently selected by the user, and gives other information such as signal strength and battery level.

A 4-pin male headset connector is provided for connection with a standard Clear-Com headset or similar. The CellCom 10 beltpack will operate for up to 8 hours on four AA alkaline or rechargeable NiMH batteries.

Any or all of the beltpack's six audio routes may be kept open while you talk or listen on the beltpack.

BELTPACK TOP CONTROL SECTION

Figure 6-2: View of Top of Beltpack

① Talk Knobs, Channels A and B

The talk knob functions as a volume control for incoming audio assigned to channels A and B. Turn the knob clockwise to increase the volume, and counterclockwise to decrease it.

To talk or listen on a channel, press and hold the knob down while speaking or listening from the headset. While you hold the knob down, your voice transmits on that channel. When you release the knob, your voice no longer transmits.

To "latch" a knob "on" for hands-free use, quickly tap the knob. Another quick tap releases the latch.

② Level-Control Lights, Channels A and B

Three level-control lights are located next to each talk knob. The first light is green, the second is yellow, and the third is red. With the knob turned fully counterclockwise, only the green LED is lit to indicate low volume. Turning the knob clockwise, low audio level is heard in the headset. Turning the knob more, both the green and yellow LED's light, and higher audio level is heard. This continues through the maximum audio level, indicated by only the red light being lit.

③ Talk/Listen Lights, Channels A and B

The green "listen" light blinks whenever a beltpack receives audio from a source whose label is displayed on the beltpack's LED screen. When you press the talk button to "talk," the green light then illuminates steadily and the red light also illuminates.

④ Answer-Back Lights

The green and red lights labeled "answer" illuminate when a source who is not on the beltpack's presently selected communication routes tries to initiate a call. The green light flashes when a call is coming in. By pressing the answer-back button on the front of the beltpack, you can talk to the source. The green LED then lights steadily and the red LED lights, until the conversation is ended by again pushing the answer-back button.

BELTPACK FRONT/DISPLAY SECTION

Figure 6-3: View of Front of Beltpack

① Backlit LCD Display

The display screen shows the various communications routes and other information relevant to the beltpack. The backlighting comes on when any action is taken with the scroll or enter buttons, and remains on for approximately 10 seconds. During the answer-back process, the label of the source is displayed in the lower center of the display.

② Left and Right Scroll Buttons

When you press the left and right scroll buttons, the beltpack's display screen scrolls to the left or right, displaying "pages" of information, and menu options on those pages. These buttons work in conjunction with the enter button, described below.

③ Enter/Answer-Back Button

The enter/answer-back button has two primary purposes. When you view the menus on the beltpack's display screen, you can select an option by pressing this button and you can exit a menu by selecting the up-arrow icon. In this way, the button serves as an enter key.

During normal beltpack operation it functions as the answer-back key, with which you can activate a talk to an unassigned source when the answer-back "talk" light illuminates to indicate an incoming call (see description in "Beltpack Top Control Section" above).

BELTPACK REAR/BATTERY SECTION

Figure 6-4: View of Back of Beltpack

① Power Button

The recessed power button is used to turn the CellCom 10 beltpack on and off. Press and hold the button for about three seconds to turn the unit on. To turn the unit off, again press and hold the button for about three seconds.

② Battery Case

The removable battery case will hold four alkaline AA or four NiMH (nickel-metal hydride) rechargeable batteries. These batteries alternate, with the negative pole contacting the spring and the positive pole contacting the plate inside the case.

To remove the battery case, press on the top of the belt clip to lift it off the case, and with the thumb and middle or ring finger of the other hand squeeze the side tabs of the case and lift it out, slightly tilting the lower (toward the bottom of the beltpack) portion of the pack out first.

To insert the battery pack, follow the above instructions in reverse. Note that the battery case has a clip-on lower cover; make sure to put it back in place before putting the battery case back into the beltpack.

Caution: Do not put battery packs containing alkaline batteries into a recharger, or recharge them in the beltpack. Serious damage or injury could result.

③ Belt Clip

The belt clip is spring-loaded, with enough tension to hold the beltpack to the user's belt and against the hip. Note that the upper portion of the rear of the beltpack, connected to the belt clip, is a separate piece; the entire belt clip assembly may be replaced in case of damage.

BELTPACK BOTTOM CONNECTOR SECTION

Figure 6-5: View of Bottom of Beltpack

① Data Connector

This 3.5 mm (1/8 inch) tip-ring-sleeve (TRS) connector is used to connect the beltpack to a computer in order to identify the beltpack to the base station during initial registration and system setup. It may also be used if an upgrade to the beltpack firmware is ever required in the future, to add new features and capabilities. See the section "Registering the Beltpack with the Base Station" for further details.

② Headset Connector

The male 4-pin headset connector provides audio pathways for the headset microphone and headset earpiece(s). This connector supports all Clear-Com and compatible headsets using female 4-pin connectors. It will support dynamic microphones.

③ Battery Recharger Connector

The CellCom 10 beltpack features an internal battery charger when you insert four AA-format NiMH batteries to power the unit. The recharger circuit includes a thermistor that senses the temperature of the battery pack to prevent

overcharging. To use this internal recharger, plug in the small barrel connector on the supplied universal power supply into the beltpack connector, and then plug the supply into the local AC current. The beltpack will automatically shut off when the charging PSU is plugged into it. While it is charging, the beltpack cannot be turned on. You can only turn it on when the charging PSU is disconnected. A full charge takes approximately 3 to 4 hours depending on the battery capacity. After this time, the charger will maintain a trickle charge to keep the beltpack fully charged.

CellCom 10 beltpack usage time is dependent upon the batteries used. Some batteries require more charge/discharge cycles than others to reach their rated capacity.

Caution: Do not put battery packs containing alkaline batteries into a recharger, or recharge them in the beltpack. Serious damage or injury could result.

BELTPACK TURN-ON SEQUENCE

After pressing the POWER button on the rear of the beltpack for approximately three seconds, the top control panel LEDs will flash and the display will light. The display will say "CellCom 10" and "Searching for Network." It will briefly say "Getting Roles," and then will go to the main user screen.

The beltpack will always begin on page 1, which has the first two communication routes assigned to the beltpack. When programming communication routes for the users in the system, it is best to put the most commonly used ones on this page.

BELTPACK TURN-OFF SEQUENCE

To turn off the beltpack, press and hold the POWER button on the rear of the beltpack for about three seconds. The main screen will close, followed by a screen that says "CellCom 10" and "Shutting Down."

POWERING THE CELLCOM 10 BELTPACK

The supplied battery pack holds four AA-sized batteries. Standard AA alkaline batteries will provide between 7 and 8 hours of typical use. The batteries alternate in the battery case, with the spring on the negative end and the tab on the positive end.

For best performance, use fresh alkaline batteries that have been properly stored and kept away from excessive heat. As with all other battery-powered electronic items, when the CellCom 10 beltpack is stored for extended periods of time, remove the batteries to prevent damage from possible leakage of the alkaline cells.

Caution: Make sure that CellCom 10 battery packs loaded with alkaline batteries are not put into a battery charger, or that the internal beltpack charger is used to attempt to charge them. Damage and possible injury will result.

Rechargeable AA-size NiMH (nickel-metal hydride) batteries may be used with the CellCom 10 beltpack. Select good quality batteries with high amperage

ratings for the best and longest performance. These batteries will last for many charge cycles, and will power the beltpack for approximately 8 hours.

If you are charging the batteries twice daily, then the battery lifetime would be approximately 8 months. It is recommended that the batteries be replaced every 4-5 months in these circumstances.

Note: CellCom 10 beltpack usage times are dependent upon the batteries used. Some batteries require more charge/recharge cycles than others to reach their rated capacity.

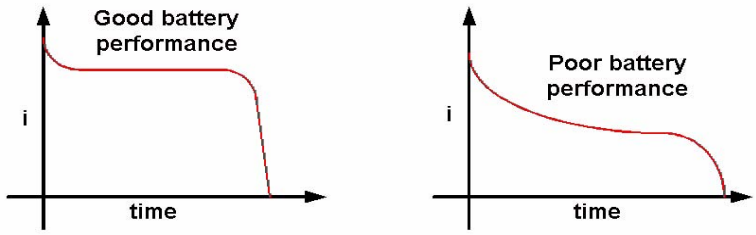


Figure 6-6: Battery Discharge Characteristics

The beltpack front-panel display has an icon that shows the battery condition. It has five vertical lines to signify the remaining charge. When the icon has dropped down to the last two lines, or if it drops quickly after being turned on after previous use, it will be time in the next few minutes to recharge the batteries (if rechargeable ones are being used) or replace them. The beltpack will turn off by itself at low battery levels.

Within the menu structure of the beltpack, a low-battery alarm is available and may be set. When activated and when the battery level is sufficiently low (approximately 40 minutes of remaining battery life) the headset user will hear a beep at intervals and the battery indicator will flash to indicate that the batteries must be replaced or recharged soon. This setting is available under Alarm Options.

The CellCom 10 beltpack features an internal battery charger circuit, with intelligent circuitry to prevent overcharging. It is powered via the pin connector on the bottom of the beltpack, using the supplied universal power supply. A thermistor (temperature-sensing device) measures the change in temperature of the battery when charging, letting the circuit know when to cease charging the batteries.

Spare clips of four batteries are available by contacting the Sales Department.

REGISTERING BELTPACKS WITH THE BASE STATION

The PC-to-Beltpack serial cable is used to register beltpacks with the base station. It can also be used to upgrade the firmware of the beltpacks. A PC software utility program is used in conjunction with this cable to register the beltpacks.

For instructions on registering beltpacks with the base station, and for upgrading the firmware, see the chapters "*CellCom Toolkit*" and *"Cellcom Configuration Editor"*.

The cable consists of a female 9-pin D type connector (PC connection) and a 3.5 mm (1.8-inch) stereo jack plug (beltpack connection). Care must be taken to select a jack plug that fits completely through the plastic surround of the connector at the bottom of the beltpack.

The data connections between the D connector and the stereo jack plug are as follows: pin 2 to tip, pin 3 to ring, and pin 5 to sleeve. Pins 1,4,6 and 8 on the PC connector are shorted together, as with the PC to CEL-BASE cable.

REMOVING REGISTERED BELTPACKS FROM THE BASE STATION

Beltpacks can be removed from the base station and new ones substituted with the CellCom 10 Toolkit program. Refer to the chapters "*CellCom Toolkit*" and *"Cellcom Configuration Editor"* for more information.

ACCESSING THE TALK/LISTEN PATHS ON THE CELLCOM 10 BELTPACK

You can access up to six communications routes with a beltpack. You activate a route by pressing the appropriate talk button (A or B) when the desired label appears on the beltpack's display.

- Page 1 of the beltpack's display screen shows the assignments for the Talk A and Talk B buttons (2 assignments).
- Page two shows the next set of assignments for the Talk A and Talk B buttons (2 assignments).
- Page three shows the next set of assignments for the Talk A and Talk B knobs (2 assignments).

Figure 6-7 shows how the front-panel screen on a beltpack displays its six communications routes.

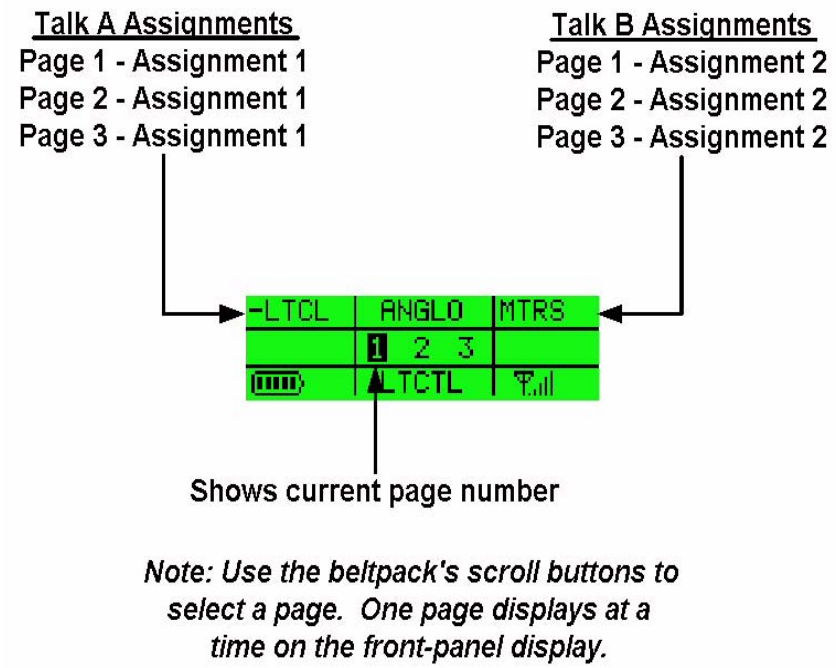


Figure 6-7: How the beltpack displays its six communication routes

The case of a label on the beltpack indicates its assignment type:

- All uppercase - Talk
- First letter in uppercase, rest lowercase - DTL
- All lowercase - Listen

To activate a talk or listen to an assigned source or destination ("label"):

1. Use the beltpack's scroll buttons to scroll to the page on which the desired assignment ("label") appears. The beltpack holds three pages of assignments. Each page displays two assignments.

   As you scroll, you will hear "beeps" in the headset that correspond to the page displaying on the beltpack: 1 beep for page 1, 2 beeps for page 2, etc.
2. When you reach the appropriate page, select one or both of the assignments on that page by depressing the corresponding talk buttons on the beltpack (A or B).
3. Press and hold the appropriate talk button to talk or listen to the destination. Release the button to close the talk or listen path.

   Alternatively, you can quickly tap the talk button to latch it "on." Quickly tap it again to release the latch.
4. To activate another communication route, repeat steps 1 through 3.

You can keep all six communication routes "open" at the same time. You will hear all activity on these routes in your headset.

Note: Two-wire and four-wire devices can have dual talk-and-listen or just listen assignments.

SETTING AND ADJUSTING LISTEN LEVELS

You can adjust a beltpack's incoming audio volume ("listen level") in two ways:

- You can set the overall maximum level for the beltpack by using the beltpack menu options.
- You can adjust the incoming audio level as you talk or listen on the beltpack using the beltpack's talk buttons.

To adjust the overall maximum "listen level" for a beltpack:

1. From the beltpack's display, scroll to Audio Options, then Headset Options, then Master Level.
2. Select Master Level by pressing the enter button.

   A bar graph appears on the display.
3. Using the right and left scroll keys, adjust the level up or down as desired on the bar graph.

   Typically, the level control will be set to around 2/3 of maximum.
4. When the desired level is reached, press the enter button.

   That selection is saved in the beltpack's memory. The display returns to the previous screen.

To adjust the listen level as you talk or listen from the beltpack:

- As you talk and listen, rotate an assignment's talk button to increase or decrease the incoming volume level ("listen level") for that assignment.
- As you scroll between pages, the listen levels for the various assignments remain intact. For example, rotating the talk button to increase or decrease the listen level for the first assignment on page 2 will not affect the listen level set with the same talk button on page 1 or 3.
- The three lights next to each talk button, labeled "Vol A" and Vol B," show you the current listen level. At the lowest audio level, the green light illuminates. As the listen level increases to moderate, the yellow light illuminates, and as it increases to maximum, the red light illuminates. Note that the position of the talk button does not affect the level that is heard or indicated by the lights.

HEADSET LIMITER

The overall headset volume may also be affected by the headset limiter value set on the beltpack. See section "BELTPACK MENU OPTIONS" for more details.

USING THE BELTPACK ANSWER-BACK FUNCTIONS

A beltpack's "answer-back" key performs two functions:

The first function is to answer a call from a source whose "label" does not appear on the currently selected beltpack page.

When a source whose label does not appear on the currently selected beltpack page, but whose label does appear on a non-selected page, your beltpack's "answer-back" light flashes, and you can hear the caller's voice in your headset at whatever incoming volume you previously set for that label.

You can answer this call in one of two ways:

- Press the front-panel "answer-back" button on your beltpack. This establishes a return talk path to the calling beltpack. You can press and hold the button to talk or you can quickly tap the button to "latch" it on.
- Use the front-panel scroll buttons to scroll to the page where the source's label appears and press the appropriate talk button as usual.

The second function is to call a beltpack even though it does not have your "label" assigned to it. You must have assigned the destination beltpack's "label" to your beltpack however to make this type of call.

For example, a stage manager labeled "STMGR" has a lighting crew member's label "LGT1" assigned to his beltpack. However, the lighting crew member does not have the stage manager's label assigned to his beltpack.

The stage manager can call the lighting crew member in the usual way. The lighting crew member can answer the call with the "answer-back" button on his beltpack and establish a private conversation. The lighting crew member cannot however initiate a direct call back to the stage manager.

BELTPACK MENU OPTIONS

The CellCom 10 beltpack presents you with a number of adjustable parameters. The main categories of the adjustments are: Alarm Options, Audio Options, View Status, and Adjust Contrast accessed through the menu. To enter menu mode hold down both page buttons simultaneously until the beltpack enters menu mode (about 5 seconds).
An icon of an upward pointing arrow designates EXIT or BACK, and is available on each menu page. Selecting this icon and pressing the center ENTER button takes you to the previous screen or exits to the beltpack's main menu.

ALARM OPTIONS

Low Battery Alarm

The low-battery alarm has two settings: on and off. Using the scroll keys, select the desired setting and then press the center ENTER key.

- When you select ON, you will hear a beep at intervals in your headset to indicate that it is time to replace or recharge the belpack batteries. This will occur when the battery level is sufficiently low (approximately 40 minutes of remaining battery life). The battery indicator will also flash.
- When you select OFF, you will not be warned of low battery level.

Low Signal Alarm

The low-signal alarm has two settings: on and off. Using the scroll keys, select the desired setting and then press the center ENTER key.

- When you select ON, you will hear a beeping in the beltpack's headset when the beltpack is almost out of the range of the antenna, and will soon lose connection with the system.
- When the beltpack's signal-level icon is at the second-lowest increment, you will hear one quick beep and two slightly longer beeps at approximately one-second intervals in the headset. You will hear the same beeps when you go completely out of range and connection is lost with the antenna (and the base). These beeps continue until you move into an area where the signal is stronger.
- This setting may be especially useful when you are learning to establish the coverage area for a particular location. Because the signal level when the alarm is first activated is still strong enough for conversations to happen (though possibly with occasional audio dropouts), it may not be desirable to keep this alarm on during normal operation of the system. This low signal alarm is also useful for checking out the coverage in a location when first setting up transceiver/antennas, for either a temporary or permanent installation.
- When you select OFF, the low signal alarm does not operate.

AUDIO OPTIONS

Headphone-Off Level Option

This option allows you to select the signal threshold when the headphone audio "turns off." Level settings are - 6, -12, -18, and – 70 dB. The typical setting is –70 dB, which functions as "always on."

Page Lock Option

When you select the Page Lock option the page change keys no longer operate.

Headphone Limiter Option

This option introduces a limiter into to headphone audio circuitry, to control excessive levels and resulting stress on the ear of the user. The level can be set anywhere in the range -32dBu to +16dBu using the Headphone Limiter display on the beltpack. The typical setting is –6 dBu.

Microphone Type Option

This option allows you to select the proper setting for the headset microphone. The available settings are Dynamic (Balanced) Mic and Dynamic (Unbalanced) Mic. For most Clear-Com and other headsets, the Dynamic (Unbal) Mic setting is proper.

Microphone Level Option

This option allows you to set the level of the beltpack's headset mic, increasing or decreasing its gain going into the system. For Type I beltpacks the gain settings are 40, 50, and 60 dB, for Type II beltpacks the gain settings are 50, 55, 60 and 65 dB. The typical setting is 50 dB.

Headset Options

Two headset options are offered:

- Master Level
- Sidetone Level

The Master Level control accesses a slide bar going from "-"to "+", and controls the overall maximum level that can be heard through the headphones. This gain control permits adjustment among headsets with different sensitivities, and for different use conditions (quiet studio versus loud live performance environment). Typical setting is 2/3 to 3/4 of the way toward "+".

Sidetone Level controls the amount of the user's own voice (local sidetone) that is injected into the headphone from the headset mic. It is activated when you push a talk button or an answer-back key, to let you know that the microphone is on. If you do not push a talk button, you do not hear sidetone.

VIEW STATUS

Role Information

Role Information gives the label (user name) that has been assigned to the particular beltpack, and also gives a numerical Role Number which the system uses – typically starting with 700 for the first beltpack and going up from there.

Beltpack Version

Beltpack Version gives the current software version on the beltpack, and a CRC number. Use these numbers to determine whether a beltpack contains the latest software version, and to confirm the success of a software upgrade.

Beltpack ID

Beltpack ID, also known as IPEI, gives the unique identification number for the transceiver in the CellCom 10 beltpack.

RF Carrier Mask

The RF carrier mask tells the base station and beltpacks which of the standard DECT carrier frequencies to use. In Europe, for example, the standard carriers 0 to 9 (1880 to 1900 MHz) are designated as "0x03FF000000." Other parts of the world, such as South America, use Extended Carriers, such as 18 to 27 (1910 to 1930 MHz), designated as "0x0000007FE0." The DECT stacks in both the CEL-TA transceiver/antenna and the CEL-BP beltpack must be told which

group of 10 carrier frequencies to use via the “mask,” when they are first initialized.

Connection Info

Connection Information defines all of the various DECT information for the beltpack transmission and link to the transceiver/antenna. It also gives the Carrier Number and Slot that the beltpack is currently using (this can dynamically change as needed during use). In addition, the Received Signal Strength Indication (RSSI) is numerically indicated, with 55 being the highest value; also, the error percentage is shown.

Adjust Contrast

Adjust Contrast provides a slide bar going from “-“to “+”, allowing the user to adjust the contrast on the display. Typical range is between 1/2 and 3/4 toward “+”.

7 PROGRAMMING AT THE BELTPACK

INTRODUCTION TO PROGRAMMING ON THE BELTPACK

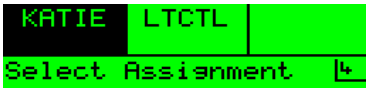
In programming the Beltpack, the general considerations are:

- It is necessary to have a radio connection to be able to engage programming mode. It is not generally possible to enter programming mode unless the normal working display is present.
- To access the main programming menu, hold both the UP and DOWN keys pressed together for at least 3 seconds. This calls up the main programming menu.
- The Beltpack saves programming data when you press enter on a menu which does not have an UP arrow at the right hand end. To exit without saving, press the UP and DOWN buttons simultaneously for 3 seconds.
- Generally buttons auto-repeat when held pressed.
- The "cursor" is the highlighted item and it cycles round to the other end of the menu when it reaches one end.
- The icon shown in a box is the currently selected item.
- If the right hand end of the menu contains an UP arrow, selecting this and pressing Enter will take you back up one level in the menu structure and will eventually return you to the main working display.
- The backlight times out after 15 seconds.

The menus in Program Mode are presented graphically as a menu map. The screen pictures shown in this document refer to beltpacks running V4A or later of the firmware. Beltpacks with earlier versions of the firmware may display slightly different screens.

SELECTION OF KEY AND PAGE

Several areas of the programming set up a mode or function on a particular key. It is, therefore, necessary to select both the key and the page on which it appears prior to entering the required programming menu. The ‘Select Assignment’ display (below)



is used to select the key and appears whenever a key selection is required. The page which appears is the one which was current when programming mode was entered.

If, having entered programming mode, you find that the required key is not on the page which is displayed, go to the page selection menu. This indicates (and puts the cursor on to) the page number which was selected. It also offers the facility to change the current page number if necessary.

To see both the page number and its content simultaneously, go to normal operation as described in the operational information.

BELTPACK PROGRAMMING - MENU MAP

On the menu map below, the flow is downwards and to the right unless indicated otherwise.

MAIN PROGRAMMING MENU

This is the main menu for programming the Beltpack.

You reached this menu by holding both the UP and DOWN keys pressed for at least 3 seconds. To return to normal operation, select Exit (the Up arrow on the display) and press pushbutton C.

To navigate around any menu, use the UP and DOWN scroll buttons to highlight the required item (the highlighted item is shown in inverse video). Then press Pushbutton C (effectively the “Reply/Answerback” key in normal mode or "Enter" key when in Program Mode) to implement the selection.

- Main programming menu showing the Master Level option selected.

This option allows the master volume level to be set in the range -12dB to 0dB using the scroll buttons.

- Main programming menu showing the Settings option selected.

- Main programming menu showing the Button Options selected.

- Main programming menu showing the Information (Status) option selected.

- Main programming menu showing the Page Options selected.

- Main programming menu showing the Exit (from Program mode to normal operation) option selected.

THE PUSHBUTTON OPTIONS MENU

This is the Pushbutton menu for programming the key assignments and how the pushbuttons behave on the Beltpack.

Note: These features are not operational on CellCom-10 systems.

You reached this menu by selecting the Page option on the main programming menu. To return to the main programming menu, select Exit (the Up arrow on the display) and press pushbutton C.

- The Pushbutton menu showing the Assign Route to a Key option selected.

- The Pushbutton menu showing the Key Latch / Nonlatch functions option selected.

- The Pushbutton menu showing the Talk / Listen setup option selected.

- The Pushbutton menu showing the option to Delete a Key Assignment Route.

- The Pushbutton menu showing the Page Selection option selected.

- The Pushbutton menu showing the Exit (to the main programming menu) option selected.

THE ALARM OPTIONS MENU

This is the Alarm menu for determining whether the low battery and/or low signal strength warnings should sound in the headphone.

You reached this menu by selecting the Alarm option on the main programming menu.

To return to the main programming menu, select Exit (the Up arrow on the display) and press pushbutton C.

- The Alarm menu showing the low battery warning option selected.

- Press button C to select the low battery alarm menu and use the scroll buttons to switch between the low battery alarm settings.

- The Alarm menu showing the low signal strength warning option selected.

- Press button C to select the low signal alarm menu and use the scroll buttons to switch between the low signal alarm settings.
- The Alarm menu showing the Vibrate option selected (Type II beltpacks only).

- Press button C to select the vibrate alert menu and use the scroll buttons to switch between the vibrate alert settings.
- Exit the Alarms menu by using the scroll buttons to select the Exit symbol and press button C.

SWITCHING THE LOW BATTERY ALARM ON AND OFF

Select the battery from the above menu and press Pushbutton C. This calls up the low battery alarm menu on which you can set the low battery alarm On or Off.

When the low battery alarm is set use the scroll buttons to select the Exit symbol and press button C.

SWITCHING THE LOW SIGNAL STRENGTH ALARM ON AND OFF

Select the transmitted signal icon from the above menu and press Pushbutton C. This calls up menu on which you can select low signal alarm On or Off.

.

When the low signal alarm is set use the scroll buttons to select the Exit symbol and press button C.

THE VIBRATE ALERT MENU

This is the Vibrate menu for determining whether the low battery and/or low signal strength warnings should use the vibrate function (type II beltpacks only).

You reached this menu by selecting the Alarm option on the main programming menu then selecting the Vibrate option. To return to the main programming menu, select Exit (the Up arrow on the display) and press pushbutton C.

Use the up and down menu keys to highlight the required Vibrate option.

Press Enter to confirm the new setting then select Exit to return to the Alarm menu.

THE HEADPHONE MENU

You reached this menu by selecting the Settings option on the top level programming menu, then the headphone options on the audio menu.

- The Headphones menu showing the option to set the lowest level to which the headset can be adjusted (sometimes also known as the "Gate Level").

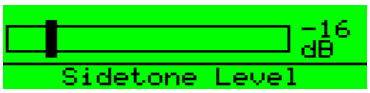
- Press button C to select the Headphone Off menu and use the scroll buttons to select one of the settings.

- Press button C to select the setting, then use the scroll buttons to select Exit and press button C to return to the previous menu.
- The Headphones menu showing the Headset Limiter threshold option selected.

- This facility allows you to make a local setting of the maximum signal level which is permitted to reach the headphone. The available levels are -6 to +16 dBu in 1 dBu stepsUse the scroll buttons to set the Headphone Limiter level on the slider then press button C to return to the previous menu.

- The Headphones menu showing Sidetone level selected.

- Press button C to select Sidetone level and use the scroll buttons to set the Sidetone level on the slider then press button C to return to the previous menu.



THE MICROPHONE MENU

From the main pregramming menu select Settings and then Microphone Options to display the Microphones menu.

- The Microphones menu will be displayed.

- Select Microphone Type using the scroll buttons to display the Microphone Type menu.

- Use the scroll buttons to select the microphone type from those available (Dynamic (Bal) mic, Dynamic (UnBal) mic, Electret mic) and then press button C to set the microphone type. Use the scroll button to select the Exit symbol and press button C to return to the main Microphone menu
- The Microphone menu showing the microphone level option selected.

- This facility allows you to select a level of microphone gain and so control the sensitivity of the microphone in the headset. Use the scroll buttons to select the Microphone level required from the options available (these will differ depending on whether the bettpack is type I or type II).

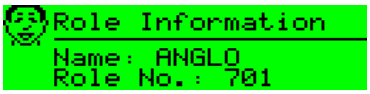
- Press button C to select the level setting and return to the previous menu or use the scroll buttons to select Exit and press button C to exit.

THE STATUS (INFORMATION) MENU

This function appears after you have selected the Information symbol from the the main programming menu.

- The Status (Information) menu showing the Role Information icon selected. Note that this face icon is used in two different menus. It appears in the Talk/Listen menu to denote the Talk and Listen mode and it is used here, in the Status submenu to denote Role Information.

When this icon is selected the display appears showing the Role name and the Role number which represents it.



- The Status (Information) menu showing the Beltpack version number icon highlighted.

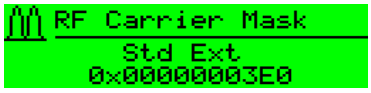
- When this icon is selected the display appears.

- The Status (Information) menu showing the Beltpack ID icon highlighted.

When this icon is selected the display appears. IPEI stands for International Portable Equipment Identifier, EMC for Equipment Manufacturer Code, PSN for Portable Serial Number (unique to every Beltpack) and C for check-digit.

- The Status (Information) menu showing the Beltpack RF Carrier icon highlighted.

When this icon is selected the display appears showing the RF carrier mask in hexadecimal format. This mask is unique to your country's allowed DECT band. It is set to a default European mask. See the Product manual for changing this.



- The Status (Information) menu showing the Connection Information icon highlighted.

When this icon is selected the display appears. The components of this display are laid out in the format which is specified for this technology and appear as follows:

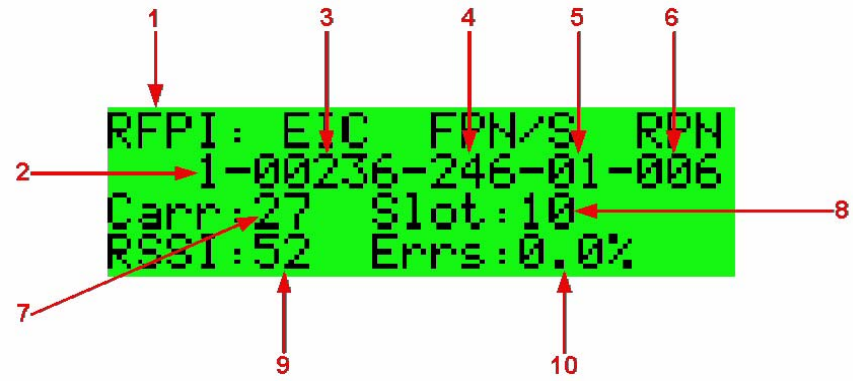


Figure 7-1: Connection Information Display

Table 1: Connection Information

Item	Description
1	Radio Fixed Part Identifier. This title refers to the whole of the second line of text. The RFP is the Radio Fixed Part to which the Beltpack is currently connected. (Much of this line of text is not unique to one Active Antenna.)

Table 1: Connection Information

Item	Description
2	This is the PARK (Primary Access Rights Key) number (reserved for future use.)
3	The abbreviation stands for Equipment Installer Code and the number on the second line is the EIC number.
4	Fixed Part Number. This and item 6 below are unique to the particular Active Antenna.
5	Fixed Part Sub-Number. This is effectively the system number which identifies which matrix the Beltpack is registered with.
6	Radio Fixed Part Number. This is the identifier of the Active Antenna on the system.
7	Carrier Number (both Active Antenna and Beltpack)
8	Timeslot Number (used by Active Antenna)
9	Received Signal Strength Indication (digital indication). This is an arbitrary number in the range 0-52 and, therefore, significant only in the context of a particular installation.
10	Block error rate for received frames.

From these displays, press button C to return to the status menu.

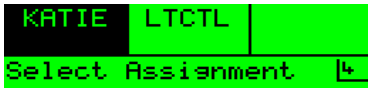
ASSIGN ROUTE

This facility allows you to assign a route to a pushbutton (key).

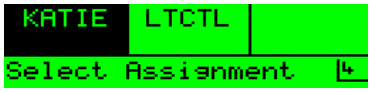
Note: These features are not operational on CellCom-10 systems.

This is one of the procedures which requires Selection of Key and Page. The procedure is as follows:

1. Enter Program Mode and navigate to the Pushbutton Menu.
2. Ensure that the currently selected Page is appropriate for the route you want to assign to a key.
3. Select the # symbol on the Pushbutton menu and select the key which appears next.



4. The Beltpack does not display any routes until it has downloaded all of them and displays while it is doing so.

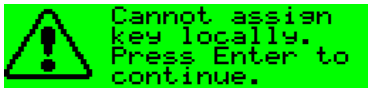


5. When downloaded, the display presents the full list of ports

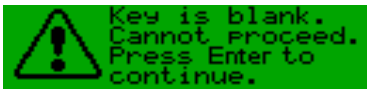
.

6. Navigate the list using the UP and DOWN arrows and press Enter to select the required route.

If the route cannot be assigned, the display will show either



or



as appropriate.

Note: Do not confuse this display with Adopting a "Role" in the operation volume. The displays are similar but the two operations are quite different and unrelated.

LATCH LATCH

This facility allows you to specify whether a particular pushbutton, in normal operation, is latching, non-latching or both. This is one of the procedures which requires Selection of Key and Page.

The procedure is as follows:

1. Ensure that the display is showing the appropriate page.
2. Navigate to the latch function symbol on the Pushbutton menu.
3. Select the required icon and press Enter. The options have the following meanings:
   - When a pushbutton is configured as latching, pressing and releasing it causes the function to remain enabled. Press it again to toggle the function concerned.

- Non-latch means the key is momentary and the function is enabled only for as long as the key is held pressed.

- In this condition, if the pushbutton is pressed and immediately released it latches. If it is held pressed for longer than one second it becomes non-latching and the function is disabled as soon as the pushbutton is released.

- Dual Talk/Listen is included here as it is effectively an extension of the latching function.

TALK/LISTEN MENU

This facility allows you to determine whether a particular route, in normal operation, is for Talk, Listen or Talk and Listen. This is one of the procedures which requires Selection of Key and Page.

The procedure is as follows:

1. Ensure that the display is showing the appropriate page.
2. Navigate to the two-way symbol on the Pushbutton menu.
3. Select the appropriate icon and press Enter.

The options have the following meanings:

- A single pushbutton press causes an audio route to be made from the Beltpack to the desired destination(s). This is normally used for communication from the Beltpack to another Beltpack and/or other type of control panel.

- A single pushbutton press causes an audio route to be made to the Beltpack from the destination. This is normally used when listening to an external audio signal which is not originating from another Beltpack or control panel.

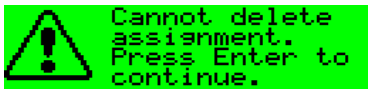
- A single pushbutton press causes a bi-directional audio route to be made between the Beltpack to the destinations. This is normally used between Beltpacks and other control panels.

DELETE A ROUTE ASSIGNMENT

This facility allows you to delete a route assignment from a pushbutton (key). This is one of the procedures which requires Selection of Key and Page. The procedure is as follows:

- Ensure that the display is showing the appropriate page.
- Navigate to the waste bin icon symbol on the Pushbutton Menu.
- Press pushbutton C which deletes the route assignment and takes the display back to the Pushbutton menu.

If deleting the assignment is not permitted, the error message is displayed.



PAGE SELECTION

When you are looking at a normal display you are looking at one of up to three numbered pages with three key assignments on each. CellCom-10 supports up to nine key assignments. The page icon indicates the page number of the current page. The setting of page number is global to the system and only one page can be current at a time.

The significance of upper and lower case text on the display is explained in the Operational Information.

To display a different page, select the page symbol on the Pushbutton menu.

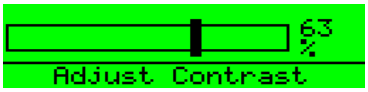
This calls up the Page Selection menu.

Navigate to the required page and press Pushbutton C to implement the selection and return to the pushbutton menu.

ADJUST CONTRAST

- Select the Adjust Contrast option from the main programming menu and press button C to display the contrast setup.

- The contrast adjustment slider is displayed.

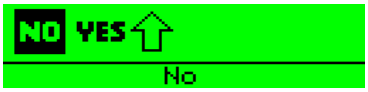


- Use the scroll buttons to adjust the contrast level and press button C to set the contrast and exit to the previous menu.

SET FACTORY DEFAULTS

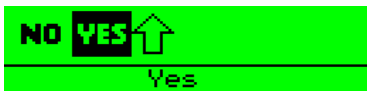
To reset the beltpack to the factory defaults go to the main programming menu and select Set Factory Defaults.

The factory defaults options are NO to cancel the operation or YES to default all the user settable parameters such as limiters and levels to the factory settings.

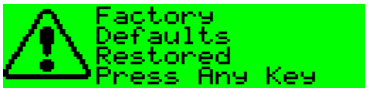


Select NO to cancel or use the scroll buttons to select YES to reset.

.



When the beltpack is reset to factory defaults and confirmation message is displayed.



Press any key to return to the main menu.

TAP LATCH

The Tap Latch function determines whether the rotary push buttons latch with one tap or two taps when the beltpack is set in latching mode.

- Select the Button Options menu from the Programming menu.

- Select the Tap Latch on the Button options menu and use the scroll keys to toggle between the 1 Tap Latch and 2 Tap Latch states.

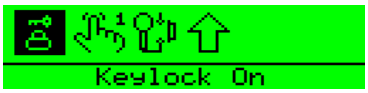
- Press button C to set the Tap Latch mode.

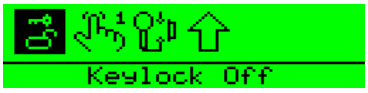
KEYLOCK

Keylock allows the scroll buttons to be disabled when on the main pageafter 3 seconds of inactivity to prevent accidental activation.

- Select Button options on the programming menu.

- Select keylock on the button options menu and use the scroll buttons to select Keylock On or Keylock Off.





- Press button C to set the keylock mode. If keylock is on a symbol will be displayed on the main pages showing that the keys are locked. To temporarily disengage keylock press and hold the scroll keys simultaneously for 3 seconds. A short beep in the headphones will signal that the keylock has been disengaged.

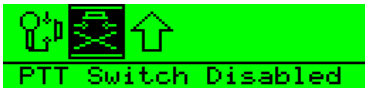
PTT CONFIGURATION

PTT configuration allows a PTT switch to be enabled or disabled.

Note: These features are not operational on CellCom-10 systems.

- To configure PTT set to the Button options menu and use the scroll keys to select PTT configuration.

- The PTT configuration menu will be displayed. Use the scroll buttons to enable or disabled the PTT switch.



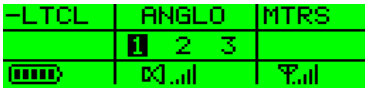
Use button C to set the PTT switch status.

MASTER VOLUME CONTROL

The master volume control is set from the main page.

Press and hold one of the scroll buttons until the speaker icon appears in the bottom centre panel.

Use the scroll buttons to adjust the master volume as indicated by the volume bars until the required level is reached.



8 OPERATING THE CELLCOM 10 TRANSCEIVER/ANTENNA

TRANSCEIVER/ANTENNA (CEL-TA)

The CellCom 10 transceiver/antennas (CEL-TA) form the transmission link between the CellCom 10 beltpacks and the CellCom 10 base. Multiple units are used to support the beltpacks and to create larger, customized coverage areas. Each CEL-TA is connected to the CellCom 10 base, either directly or via a CEL-SP splitter. The unit has two flanges on the rear side that permit the unit to be screwed or otherwise attached to surfaces.

Figure 8-1: CellCom 10 Transceiver/Antenna

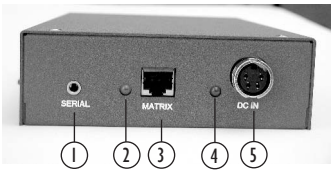
CEL-TA TOP PANEL

Omnidirectional Antennas

A pair of omnidirectional antennas are provided with the transceiver/antenna.

Antennas with different coverage patterns (directional units) that are appropriate for the 1.9 GHz range may be substituted for the provided antennas, if variations in coverage pattern are required.

CEL-TA BOTTOM/CONTROL PANEL



1 Serial Data Connector
2 Data Signal Light
3 Matrix Connector
4 Power Indicator Light
5 DC IN Power Connector

Figure 8-2: CellCom 10 Transceiver/Antenna Bottom/Control Panel

1 Serial Data Connector

This 3 mm (1/8 inch) tip-ring-sleeve (TRS) connector is used for upgrading the firmware in the CEL-TA. It will typically be unused.

2 Data Signal LED

This yellow LED indicates that a connection has been established between the CellCom 10 base and the transceiver/antenna, and that it is actively creating a coverage zone within which the beltpacks can operate. If it is off, check the cable connections at both ends, as well as the powering.

3 Matrix Connector

This RJ-45 connector is used to connect the bi-directional signal from the CellCom 10 base, directly or via the splitter. Up to 1,000 meters of 4-pair 24 AWG CAT-5 cable can be used for this connection between base and transceiver/antenna. If 26 AWG CAT5 cable is used the maximum distance is 500 meters.

4 Power LED

This green LED indicates that the transceiver/antenna is receiving power, either from its local power supply or from the connected CAT-5 cable (distances up to 300 meters, or 925 feet, from the base or the splitter) being powered via the CellCom 10 base.

5 DC In Power Connector

This connector is used to locally power the transceiver/antenna with the supplied universal power supply. Use of local power is required when the transceiver/antenna is located more than 300 meters (925 feet) from the CellCom 10 base or the splitter, and is recommended even when the transceiver/antenna is closer whenever it is available and convenient.

CABLING THE CEL-TA TRANSCEIVER/ANTENNAS

Each CellCom 10 transceiver/antenna receives its necessary data and digital communications audio via a direct connection with the base station transceiver ports. Between these two ports, up to 10 transceiver/antennas can be supported. A transceiver/antenna may either be directly connected to a base station port using 4-pair CAT-5 data cable with RJ-45 connectors on each end, or it may be connected to the base through an antenna splitter.

BELTPACK SUPPORT CAPACITIES FOR TRANSCEIVER/ANTENNAS

Each transceiver/antenna can support five beltpacks within one coverage zone. With the supplied omnidirectional antennas, the coverage pattern is circular or donut-shaped, with a maximum range of up to 250 meters (800 feet), but with typical range between 50 meters and 150 meters – depending on the environment in which it is installed.

When designing the system, determine how many beltpack users will be in or passing through a given coverage zone. If it will be five or fewer users, then place one transceiver/antenna in the center of that area. If it is between 6 and 10 users, place two transceiver/antennas next to each other, both with a direct connection to the CellCom 10 base or splitter. In larger systems – approaching 20 beltpacks – it is wiser to allow one transceiver/antenna for every 3 to 4 users to ensure smooth handoffs between transceiver/antennas. It is good practice to have each beltpack "seeing" two or more antennas, so a minimum of two antennas in any system is to be considered.

If a sixth beltpack user goes into a coverage zone with only one transceiver/antenna, and that user is out of range from another transceiver/antenna in the overall system to which that beltpack is currently connected, it will lose connection with the system. This is because the tranceiver/antenna has a maximum capacity of five beltpacks at a time. If one of the existing users in that coverage area turns off a beltpack or leaves the area, then the sixth beltpack will find an open slot and will be reconnected with the system.

The proprietary technology within CellCom 10 permits the beltpack user to go between coverage zones created by different transceiver/antennas connected to the CellCom 10 base, and for the system to hand over the communication between beltpack and base from one transceiver/antenna to the next one. Thus, a larger, customizable communications area may be designed.

COVERAGE AREAS UNDER VARIOUS CONDITIONS

Just as with any other product communicating via radio waves, the effective distance between the beltpack and the transceiver/antenna (the range) will differ depending on the particular environment in which it is being used. Radio waves can be attenuated by walls, floors, ceilings, trees, shrubbery, the human body (such as an audience), and numerous other objects. They can be reflected and/or stopped by metallic objects such as structural beams, safety doors, lighting equipment and truss, bodies of water, and so on.

Under ideal conditions, the maximum range between a CellCom 10 beltpack and a transceiver/antenna is 250 meters (about 800 feet). Typical distances are between approximately 50 meters (about 160 feet) and 150 meters (about 485 feet), depending on the particular environment.

As the transceiver/antenna requirements for a particular installation are being determined, keep in mind both the number of beltpack users who will be working in a particular area (based on the five-beltpack capacity of each transceiver/antenna), and the layout and potential RF attenuating and reflecting items in the location. Be conservative in your distance estimates to make sure that you include enough transceiver/antennas to provide the necessary coverage for the installation. Also note that additional transceiver/antennas may be added to a base, up to a maximum of 10.

TRANSCEIVER/ANTENNA SETUP RULES AND TIPS

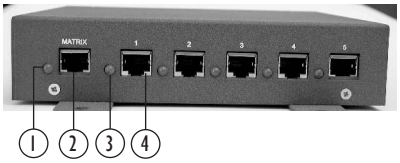
Keep the following general rules and tips in mind:

- Keep antennas high (typically, though lower placements away from interfering objects can at times be beneficial) and line-of-sight.
- Keep them away from larger metallic objects and surfaces, and from lighting truss.
- With the provided omnidirectional antennas, the coverage is circular so put the transceiver/antennas in the center of the area in which you want coverage.
- In outdoor settings with line-of-sight, the absence of beneficial reflections of the radio waves may lead to shorter than expected range; directional antennas may be of benefit here.
- When overlapping the coverage zones of transceiver/antennas to create larger continuous coverage areas, test the in-between areas with a beltpack for potential areas of low RF signal; adjust the positioning of the antennas as needed.
- Because of potential body shielding as the user moves, it will be useful to place two transceiver/antennas in different locations within larger working areas to minimize low-level signals and potential signal dropouts.
- Going between a larger area and a corridor via a door, especially a heavy or shielded one, or where the walls are thick, place a second antenna in the corridor near the doorway to assure continuous coverage.

TRANSCEIVER/ANTENNA SPLITTER (CEL-SP)

The CEL-SP antenna splitter is the device that connects multiple transceiver/antennas to the CellCom 10 base station. It has an RJ-45 connector that carries the data between a base transceiver port and the splitter, and five RJ-45 connectors to feed that information to and from up to five antennas. The splitter is always locally powered via the supplied external in-line universal power supply.

CEL-SP FRONT CONNECTOR PANEL



1 Base Connection Indicator Light
2 Matrix (CellCom Base) Connector
3 Splitter-to-Transceiver/Signal Indicator Lights (5)
4 Transceiver/Antenna Connectors (5)

Figure 8-3: CellCom 10 Splitter Front Connector Panel

1 Base Connection Indicator Light

This yellow light indicates that the CEL-SP splitter is receiving data from the CellCom 10 base.

2 Matrix (CellCom 10 Base) Connector

This RJ-45 connector accepts a 4-pair data cable from the CellCom 10 base station transceiver port. This cable can be up to 1,000 meters in length if 24 AWG cable is used or up to 500 meters if 26 AWG cable is used.

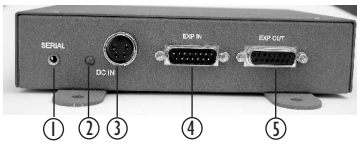
3 Splitter-to-Transceiver/Antenna Signal Indicator Light

These yellow lights indicate that a connection from the CellCom 10 base is available to the particular transceiver connected to that port.

4 Transceiver/Antenna Connectors

These five RJ-45 connectors are used to connect up to five remote transceiver/antennas to the splitter, and via the splitter to the CellCom 10 base station. Each of these cables can be up to 1,000 meters in length if 24 AWG cable is used or up to 500 meters long if 26 AWG cable is used.

CEL-SP REAR PANEL



1 Serial Data Connector
2 Power Indicator Light
3 DC IN Power Connector
4 Reserved for future use
5 Reserved for future use

1 Serial Data Connector

This 3.5 mm (1/8 inch) tip-ring-sleeve (TRS) connector is used for upgrading the firmware in the CEL-SP. It will typically be unused.

2 Power Indicator

This green LED indicates that the splitter is receiving power from the external power supply.

3 DC IN Power Connector

This connector is used to locally power the antenna splitter with the supplied universal power supply. Use of local power is required.

4 EXP IN Connector

This male DB-15 connector is reserved for future use.

5 EXP OUT Connector

This female DB-15 connector is reserved for future use.

CONNECTING AN ANTENNA SPLITTER TO THE CELLCOM 10 BASE AND TO TRANSCEIVER/ANTENNAS

After the connections have been made between the splitter and the transceiver/antennas, make sure that the data LED's are lit at the individual ports on the antenna splitter. Also make sure that the both the green power LED and the yellow data LED are lit on each CEL-TA transceiver/antenna. If all are properly lit, then the connection has been successfully made and the coverage zones will be active and will support beltpacks. If the transceiver antennas are not lit, check the connections.

9 INSTALLING A SYSTEM

You can begin using a CellCom 10 system as soon as you receive it, as long as the beltpacks are registered to the base, using the generic user labels for the beltpacks and the rear-panel connections.

PLACING THE BASE STATION

The first stage in setup is placing the base station in a convenient location, knowing that it is the central routing unit of the CellCom 10 system. You will want to make it accessible.

A CellCom system can work immediately when you receive it, as long as the beltpacks are registered to the base.

At this stage, if they are unregistered, you may want to register all of the beltpacks with the base station, or at least register one or two for system setup and testing. Follow the instructions in the chapter "*CellCom Toolkit*" to register the beltpacks.

PLACING THE ANTENNAS AND SPLITTERS

The next step is to begin placing antennas and splitters to provide the necessary coverage areas for all of the beltpacks. Your first placements of antennas and splitters will be experimental and temporary. After placing the antennas, you will walk through the coverage areas to check for gaps and then re-locate the antennas accordingly.

More information on checking coverage areas is given later in this chapter, in the sections "Determining Coverage Areas" and "Doing a Site Survey to Determine Coverage Areas."

The following questions will help you to begin placing the antennas:

- What areas will have more than five active beltpack users in them at any time? Co-locate a second CEL-TA there.
- Is there a central place to locate an antenna so that it will provide omnidirectional (all directions / circular) coverage?
- Are there balcony areas, corridors, or other rooms or areas that will require coverage with antennas?

Next decide where the antenna splitter(s) that feed these antennas will be safely located. For systems with only one or two transceiver/antennas, the cable runs will go directly from the two transceiver ports on the base station.

WIRING THE ANTENNAS AND SPLITTERS

To wire antennas and splitters:

1. Run 4-pair CAT-5 cable from the CellCom 10 base to the antenna or splitter, and determine that the antenna or splitter is showing both power (green LED lit) and signal (yellow LED lit when the base station is on).

   ***Note**: To meet FCC emissions requirements, you must fit a ferrite on any CAT-5 cable plugged into either of the two ports labeled "tranceivers." The ferrite should be fitted at the base station end of the CAT-5 cable. Position the ferrite as close to the base station as possible.*

   The manufacturer of the ferrite is Wurth Elektronix. The part number is 742 711 32.

2. Run 4-pair CAT-5 cable from the splitter to each of the transceiver/antennas.
3. Make sure that the local power supplies are plugged into the antennas, unless they are close enough to the base station to draw power from the attached CAT-5 cable.

***Note**: To meet FCC emissions requirements, you must fit a ferrite on any CAT-5 cable plugged into either of the two ports labeled "tranceivers." The ferrite should be fitted at the base station end of the CAT-5 cable. Position the ferrite as close to the base station as possible.*

The manufacturer of the ferrite is Wurth Elektronix. The part number is 742 711 32.

You will know that a transceiver/antenna has sufficient power from the cable if the green power LED and the yellow data LED light up. If you have several longer runs and are attempting to power the transceiver/antennas from the base / splitter connection, check each one again when the are all connected. The local powering for the CEL-TA is recommended in most cases to provide the most reliable long-term CellCom 10 installation.

Note that 4-pair CAT-5 cable with RJ-45 connectors on each end is specified for connection between the base station and the transceiver/antennas. Use of other cable can result in markedly shorter distances of cable runs and other possibly other performance problems.

During the initial system setup, before walking through the system with a beltpack to check for gaps in coverage, it is wise to avoid "permanently" installing the transceiver/antennas. Hold them in place in some temporary way until their optimal position is determined.

DETERMINING COVERAGE AREAS

After you have initially set up the transceiver/antennas and splitters, you can proceed to test the coverage areas and re-locate antennas and splitters, if necessary, for optimal coverage.

To determine coverage areas:

1. Once the base, splitter(s), and transceiver/antennas have been placed and wired, turn on a CellCom beltpack (assuming that it has been registered with the base station) and walk the coverage area – ideally speaking with someone else via the on-base headset or a party-line or matrix connection with the base.

   Alternatively, use the "site survey" mode on the beltpack (see "Doing a Site Survey to Determine Coverage Areas" below). It is often best to begin with one antenna in place, and then place additional units to enhance coverage.

2. Walk through all of the areas where beltpack users will typically be moving, and note any areas of weak signal, dropout, or disconnection from the system. Pay special attention to the overlap areas between antenna coverage zones,

making sure sufficient signal strength is there from each of the transceiver/antennas to make a clean handoff between them for the beltpack.

3. Finally, when the coverage zones have been properly and effectively set up, it is time to program the system. See Chapter 5, “Programming a System from the Base Station” for instructions.

DOING A SITE SURVEY TO DETERMINE COVERAGE AREAS

Some CellCom 10 users may want to test coverage areas more extensively before setting up a a complete system. Testing a system in the setting in which it will be located helps you to set up the system successfully to meet your needs. Factors in the local setting may affect the areas a system can cover, so it is important to plan a site setup accordingly.

Doing a complete site survey, as described below, helps you to set up an optimal system.

TESTING COVERAGE AREAS OF INDIVIDUAL ANTENNAS

1. Place the CellCom 10 base station in a convenient location. Register one beltpack to the base station.
2. Place one antenna in the center of the coverage area.
3. Put the beltpack into “site survey mode” by first pressing the power button on the back of the beltpack, and then simultaneously pressing the two front-panel scroll buttons.
   - When you do this, the beltpack’s display shows the “site survey” screen. Figure 9-1 shows a beltpack’s site survey screen.
   - You can also put a beltpack into “site survey mode” after it has powered up by simultaneously holding down the two front-panel scroll buttons, and selecting first “View Status” and then “Connection Info” from the base station’s front panel display.
4. Walk around the antenna with the beltpack, monitoring the beltpack’s *signal strength* and *error rate* at various distances.

   The *signal strength* is shown in the Received Signal Strength Indication (RSSI) field in the leftmost lower corner of the beltpack’s display. The *error rate* is shown in the ERR field in the middle of the display.

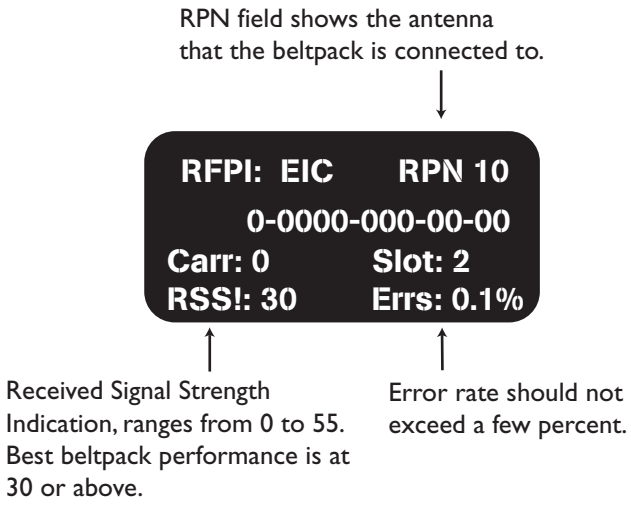


Figure 9-1: A Beltpack's Site Survey Screen

- The **RSSI** (signal strength) number will fluctuate, ranging from 0 to 55, as you walk through the coverage area, and may even fluctuate as you stand still. As a rule-of-thumb, you will obtain best system performance when the signal strength remains at 30 or above. If the signal strength falls below 30, you may start losing audio. This is the limit of the coverage zone.
- The **ERR** (error rate) number indicates packets of audio which are lost or corrupted. When this number exceeds a few percent you may start hearing audible audio breakup.

A beltpack can transmit to an antenna outdoors at an average distance of 125 meters when the beltpack has an unobstructed "line-of-sight" path to the antenna. In ideal conditions, the range may be as high as 250 meters. Indoors, a beltpack can transmit to an antenna at an average distance of 50 meters.

5. Draw a map of the coverage zone for the antenna. The coverage zone is the area where the signal strength, as a rule-of-thumb, is 30 or above and the error rate is below a few percent.
6. Repeat this process, one antenna at a time, for as many antennas as necessary to cover the required area. Overlap coverage zones so that there is no area where the signal strength is below 30, and no area where the error rate is above a few percent.
7. You will need to adjust antenna placement to get the best coverage.

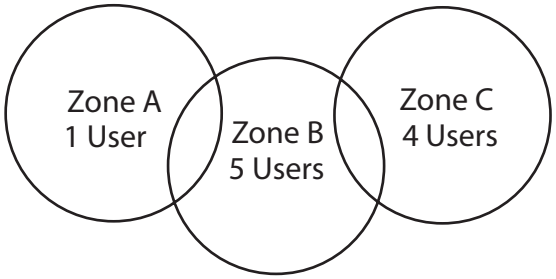


Figure 9-2: Mapping overlapping coverage zones

In some environments you may observe that despite having a high signal strength, the beltpack consistently reports a high error rate.

This could be due to two things:

- In-band interference from an RF source broadcasting in the DECT area of the spectrum. This can be verified using a DECT band monitor (which can be purchased from Vitec Group Communications), or by using a Spectrum Analyser.
- Long Delay Spread Multipath, where the signal is bounced off a number of reflective surfaces, such as metal ceilings, gantries, walkways or other large structures. This problem is greatest where the reflective surface is large and exists at a range of distances from the antenna. To resolve this problem, consider siting the antenna where it cannot "see" the reflective surface, installing a reflector close to the antenna between it and the reflective surface, or purchasing directional antennas. Contact VGC customer support for more information.

TESTING ANTENNA HANDOFF

After you test the coverage areas for individual antennas, test the handoff between the antennas. When you walk through a coverage area with the beltpack, the beltpack searches to find the antenna with the best signal strength, and switches transmission to that antenna. Therefore the beltpack continually hands off transmission among antennas as you move through the coverage area.

To test antenna handoff, connect any additional antennas in the installation and walk through the coverage areas to ensure that the coverage is continuous and complete, without audio breakups. You can tell which antenna the beltpack transmits to by looking at the RPN number in the top rightmost corner of the beltpack's display when the beltpack is in "site survey" mode. Reposition antennas if necessary. Note that the numbering to identify antennas starts at "6" to identify the first antenna, as shown in the table below.

BELTPACK SCREEN DISPLAYS:	WHICH SIGNIFIES:
RPN 6	Antenna 1 on transceiver port 1
RPN 7	Antenna 2 on transceiver port 1
RPN 8	Antenna 3 on transceiver port 1
RPN 9	Antenna 4 on transceiver port 1
RPN 10	Antenna 5 on transceiver port 1
RPN 11	Antenna 1 on transceiver port 2
RPN 12	Antenna 2 on transceiver port 2
RPN 13	Antenna 3 on transceiver port 2
RPN 14	Antenna 4 on transceiver port 2
RPN 15	Antenna 5 on transceiver port 2

Table 9-1: How antennas are numbered

GETTING INFORMATION ON ACTIVE ANTENNA STATUS

You can also monitor which beltpacks are connected to which antennas using the base station's SYSTEM menu.

When you select ANTNS from the SYSTEM menu, the display shows the status of the active antennas that are connected to the base station, and shows the slots on each antenna that are occupied by beltpacks. This information may be useful during a site survey, or when troubleshooting coverage areas or antenna connections.

A typical display is shown below:

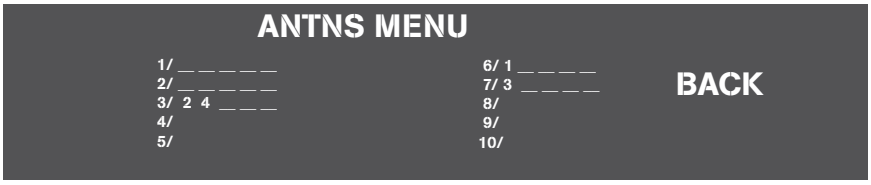


Figure 9-3: ANTNS menu

The numbers 1 through 10 represent the maximum number of antennas that can be connected to the base station. Numbers 1 through 5 can be positions on a splitter connected to transceiver port 1, while 6 through 10 can be positions on a splitter connected to transceiver port 2. An antenna connected directly to transceiver port 2 would appear at position 6.

"__" indicates an empty slot on an acive antenna that is connected to the base station. A number in place of a "__" indicates that this slot is occupied by the indicated beltpack.

Blank spaces next to an antenna number indicate that no antenna has been detected in this position.

So the above display would indicate that five antennas are connected to the base station in positions 1, 2, 3, 6, and 7. There are no active antennas in positions 4, 5, 8, 9, and 10.

There are 4 beltpacks currently connected. Beltpacks 2 and 4 occupy the first 2 slots of antenna 3; beltpack 1 occupies the first slot of antenna 6; and beltpack 3 occupies the first slot of antenna 7.

The display updates every 4 seconds to reflect changes in antenna status and beltpack connections.

Rotate or push in the setup/enter knob to exit this menu.

ASSIGNING BELTPACKS TO COVERAGE AREAS

Each antenna is designed to handle five beltpacks simultaneously. Although it can achieve this in good conditions, this may not always be possible for a number of reasons. First, interference or propagation problems may mean that not all antenna slots are available all the time. Second, a beltpack constantly searches for the best antenna signal, and may frequently switch antennas. To make this transmission seamless, a beltpack maintains the connection to its current antenna until it is confident that the new antenna is functioning well. Therefore, for a short period of time during this transition, a single beltpack can occupy slots on more than one antenna.

This means that for zones in which you are likely to need coverage for five or more beltpacks simultaneously, it is recommended that you install a second antenna. Similarly, for good coverage for nine or more beltpacks simultaneously, a third antenna may be required.

CONDITIONS AFFECTING COVERAGE AREAS

The environment in which a system is located affects the coverage area for any particular beltpack/antenna combination. The presence of walls, floors, ceilings, trees, shrubbery, people, and numerous other items may affect the coverage zone. Metallic objects, safety doors, lighting equipment, and bodies of water may possibly block transmission. You must take these factors into consideration when planning your installation.

10 CELLCOM 10 CONFIGURATION EDITOR

INTRODUCTION

The Cellcom/Freespeak Config Editor can be used to extract, backup, edit and restore configurations from the Cellcom/Freespeak-10 base units. Configurations are initially extracted from a Cellcom/Freespeak base unit via the serial cable, and once extracted they can be edited and either sent back to the base unit or saved to disk for future use.

It can also be used to "clone" a base station in case of systems failure - all beltpack registrations and the system ID are stored within the config.

LOADING AND SAVING CONFIGURATIONS

On loading, the tool should come up as follows:

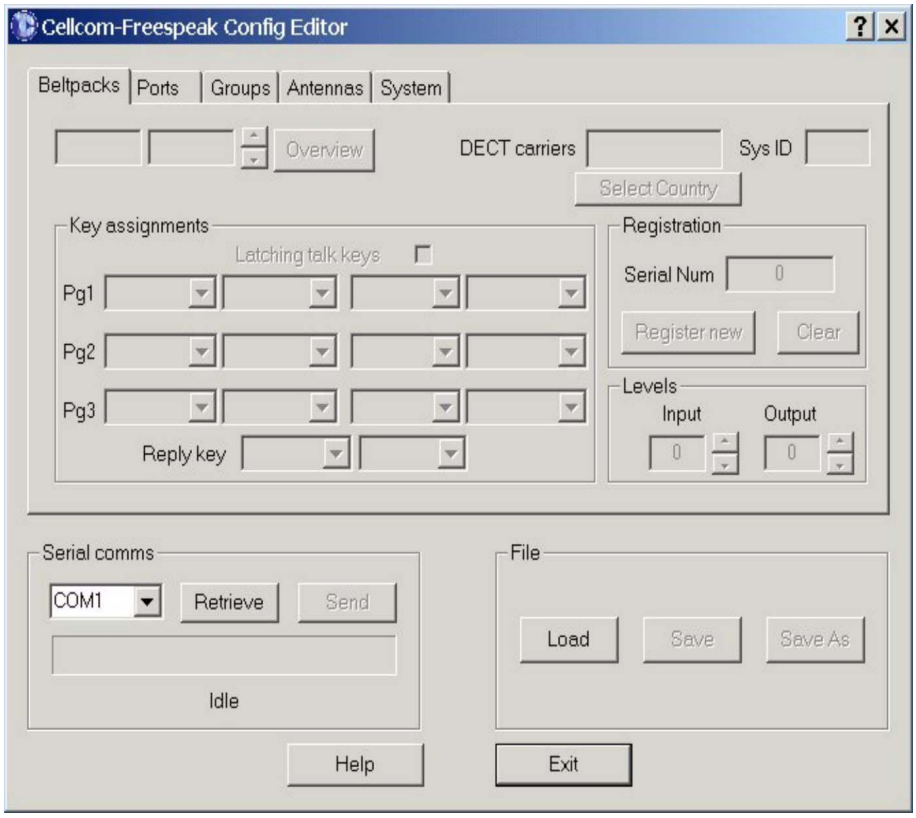


Figure 10-1: Configuration Editor

At this point you have the choice of either loading a previously extracted configuration from disk, or extracting one from a Cellcom/Freespeak base unit.

LOADING A CONFIGURATION FROM DISK.

To load a configuration from disk, click the "Load" button. A dialog box will pop up, allowing you to browse for the configuration file. Configuration files end in a ".map" extension.

COM PORT SELECTION

The COM port drop-down box shows only those ports that are available for connection to the base unit. If you do not see the port that you wish to use, it may be that another program is using this port. Close the other program down, and try again.

RETRIEVING A CONFIGURATION FROM A CELLCOM 10 BASE UNIT

- Connect the PC to the base using a standard Cellcom/Freespeak serial cable. Select the COM port that you have connected it to using the drop-down box in the "Serial comms" section of the dialog. Power on the Cellcom/Freespeak base unit and wait 30 seconds.
- Click the "Retrieve" button in the "Serial Comms" section of the dialog. Retrieval of the configuration should take around 1 min 15 secs. If the program fails to connect to the Cellcom/Freespeak base, the following dialog will be displayed:

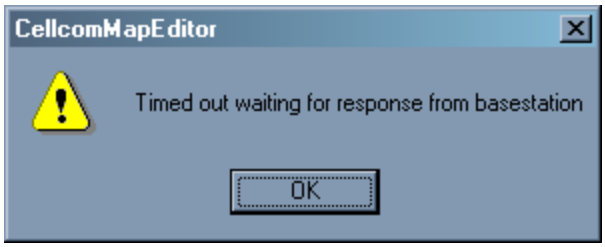


Figure 10-2: Configuration Editor Timeout

- If this occurs, check the cable, PC and base connection, and also make sure that you have waited 30 seconds since powering on the base unit to ensure that serial comms have been activated.
- Once the configuration has been retrieved from the base, the display should appear as follows:

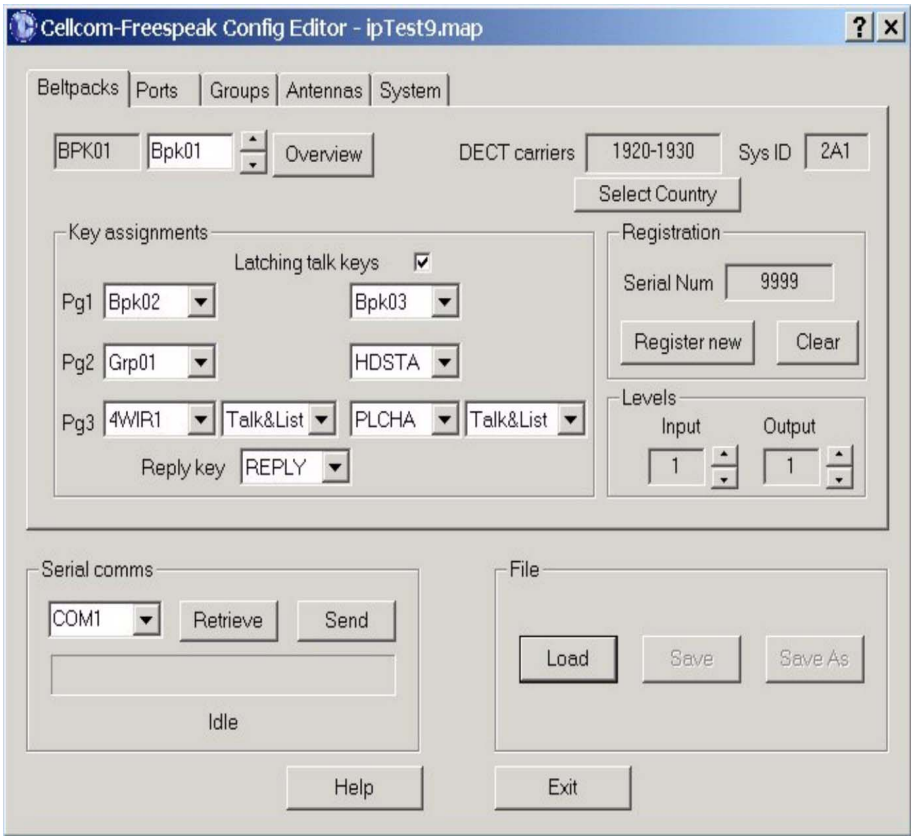


Figure 10-3: Configuration Setup

UPLOADING CONFIGURATIONS

To send an edited configuration back to the base station, re-connect the base (if you have disconnected it) and ensure that you have waited at least 30 seconds since base power-up to allow serial comms to be activated. Now click the "Send" button. Transfer should take around 1 min 15 secs, after which time the base will reboot.

BELTPACKS TAB

This tab allows you to register beltpacks with the base unit, edit key assignments and change input and output levels.

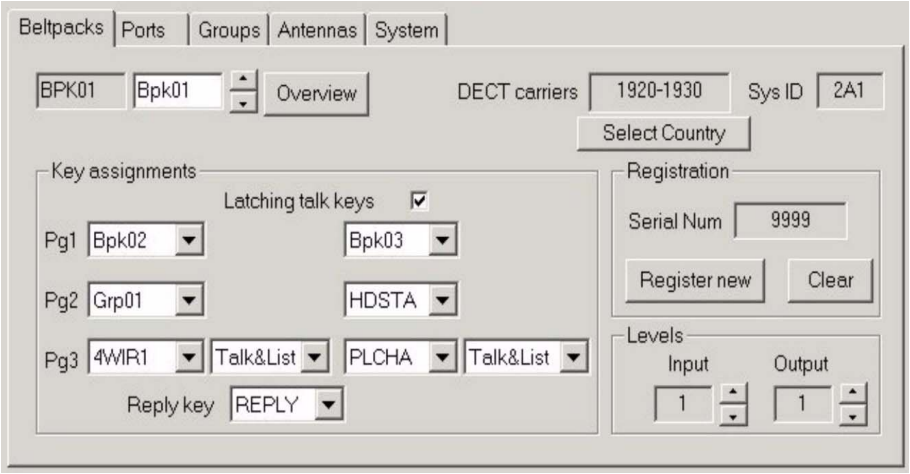


Figure 10-4: Beltpacks Tab

SELECTING THE BELTPACK YOU WANT TO REGISTER OR EDIT

Select which of the ten available beltpack "slots" you want to edit using the arrow buttons next to the "Overview" button.

CHANGING THE LABEL OF THE BELTPACK

Select the beltpack that you want to change, then over-type the text in the label edit box (shown with a white background in the illustration below). You can enter a maximum of five characters.

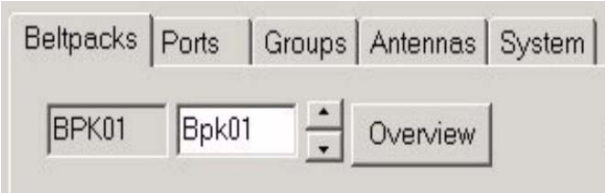


Figure 10-5: Beltpack Label

THE OVERVIEW BUTTON

Clicking the overview button shows a summary of the labels and serial numbers of the beltpacks registered in each slot.

DECT CARRIERS

This shows the range of RF carriers that the base unit is currently using, in MHz. The carriers that a unit is permitted to use vary from country to country. Authorized service personnel and distributors may change this value after entering a password - contact ClearCom sales for details.

SYS ID

This shows part of the DECT system ID, which the beltpacks use to identify which base unit to communicate with, and vice versa.

ASSIGNING BELTPACK KEYS

The program can be used to assign the destinations of each of the six (three pages of two) soft assignments of the beltpack talk keys.

The drop-down box is used to select the call destinations.

THE REPLY KEY

The key in the centre of the face of the beltpack is known as the reply key. The configuration of this key is the same across all three pages of the beltpack. It can be configured in the following ways:

- *As a reply key:* Selecting REPLY from the drop-down box next to the "Reply key" text configures the key as a standard reply key. When anyone calls this beltpack, the centre LEDs will flash and the label of the caller will appear in the display above the centre key. The beltpack user can reply to the call by pushing the centre key.
- *Assigning a call destination:* Pushing the centre key on any page will call this destination. For example, if "STGAN" is selected from the drop-down box, the user knows that they can always activate the stage announce by pushing the centre key, whatever page of the beltpack they are on. The label of "STGAN" will appear in the display above the key on all pages.
- *Locked:* Selecting LOCK de-activates the centre key. Five dashes "-----" will appear in the display above the key.

Note that in the last two cases there is no mechanism for replying to sources that call the beltpack which do not have keys on the beltpack assigned to them.

KEY ASSIGNMENT TYPES

By default an assignment is talk only; however 4-wire and partyline inputs can be selected as the following:

- *Listen:* The callee can be heard, but no outgoing audio path is created when the key is pressed.
- *Talk and listen (Talk&List):* An outgoing and incoming audio path is created when the key is pressed - that is the audio from the callee can be heard without them having to initiate a return path.
- *Dual talk and listen (Dual T&L):* A short press produces a latching listen path, while a long press produces a momentary talk.
- *Forced listen (Frc L):* Assigning a key in this way forces a permanent listen path - that is the remote source can be heard on the beltpack even when the key is not latched on. No talk path is created when the key is pressed. This may be useful for monitoring a program input or directors feed.

- *Talk and forced listen (T&F L):* The same as a Forced Listen key, except a talk path is created when the key is pressed.

The type of a key is indicated on the beltpack with the use of different cases for the label: a Talk key is shown in all capitals, e.g. “TEST”. A listen key is shown in all lower-case, e.g. “test”. Dual Talk and Listen, and Talk and Forced Listen keys are indicated by an initial capital, with the rest in lower case, e.g. “Test”.

LATCHING KEYS

Selecting the "Latching talk" check box makes all keys configured as Talk, Talk and Listen, or Talk and Forced Listen have a latching action - a short "stab" latches the key on, while a longer press causes the audio path to terminate when the user releases the key.

If this check box is cleared, Talk, Talk and Listen, and Talk and Forced Listen keys have a momentary action - the user has to hold the key down as long as they want to talk to the remote user.

Listen and Dual Talk and Listen always have a latching action regardless of the setting of this check box.

REGISTERING BELTPACKS

- First load or retrieve a configuration as described in the "Getting started" section.
- Connect the beltpack to the PC using the standard Beltpack serial cable (3.5mm stereo jack to 9 way D type connector), and power it on.
- Select the serial port that you have connected the beltpack to using the drop-down box in the "Serial comms" section of the dialog box. (Note that if you have 2 serial ports on the PC, one can be used to be program the base stations while the other can be used to program beltpacks).
- Select the "Slot" that you want to register the new beltpack in (i.e. one of slots 1 to 10) using the arrow buttons next to the "Overview" button at the top of the dialog box.

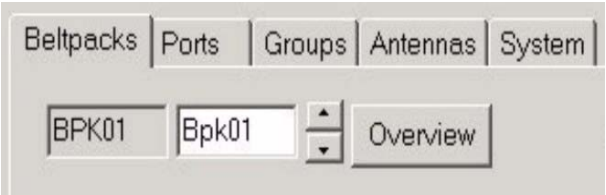


Figure 10-6: Registering a Beltpack

N.B. At this stage you can also change the label of the beltpack by overtyping the value in the edit box shown here (currently containing the text "Bpk01").

- Click the "Register New" button in the "Registration" section of the dialog box.

Figure 10-7: Beltpack Serial Number

This performs two actions - firstly it sends the system number and DECT carrier mask information to the beltpack, and secondly it stores the serial number of the beltpack in the base unit configuration.

If the program connects successfully with the beltpack, the "Serial Num" field will change to show its serial number.

INPUT AND OUTPUT LEVELS

The input level (a biasing factor applied to the audio mix of other users which adjusts the level at which other users will hear this beltpack) and the output level (the level at which the beltpack hears other users) can be adjusted between -20 and +18dB.

PORTS TAB

This allows you to change the settings of frontpanel headset, 4-wire and partyline connections.

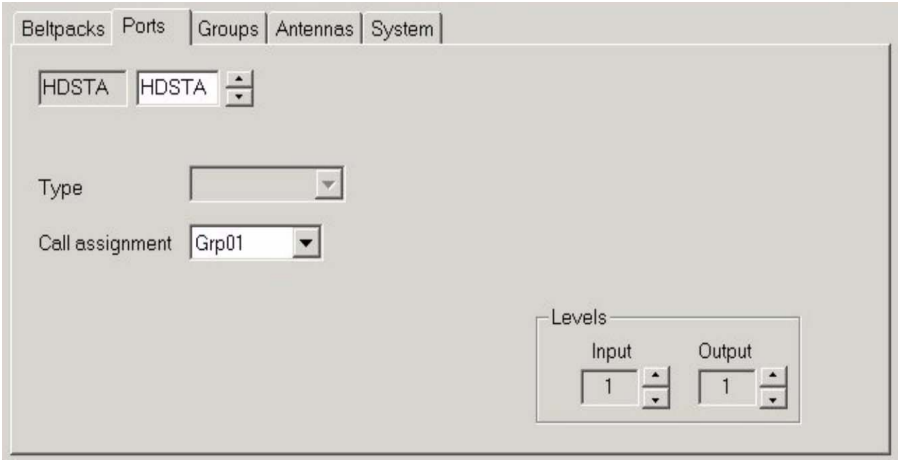


Figure 10-8: Ports Tab

SELECTING THE PORT YOU WANT TO EDIT

Select which of the audio ports you want to edit using the arrow buttons next to the right of the label edit box.

CHANGING THE LABEL OF THE PORT

Select the port that you want to change, then over-type the text in the label edit box.

TYPE DROP-DOWN BOX

This is only active when a partyline port is selected. It allows you to select between Clear-Com, Drake and RTS wired beltpack settings. This affects the gain, termination and call signaling used when communicating with this port.

CALL ASSIGNMENT DROP-DOWN BOX

This is only active for headset, partyline and 4-wire ports. For a frontpanel headset port, it specifies the port which is called when the "Talk" button for that port is pushed.

For a partyline or 4-wire port, it causes a permanent talk path to be created from the port to this destination.

INPUT AND OUTPUT LEVELS

The input level (a biasing factor applied to the audio mix of other users which adjusts the level at which other users will hear this port) and the output level (the level at which the port hears other users) can be adjusted between -20 and +18dB.

GROUPS TAB

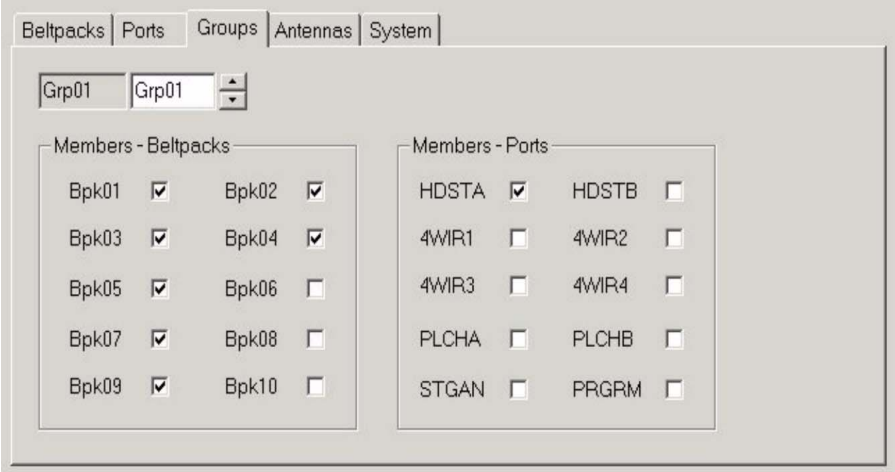


Figure 10-9: Groups Tab

SELECTING THE GROUP YOU WANT TO EDIT

Select which of the ten availablegroups you want to edit using the arrow buttons next to the right of the label edit box.

CHANGING THE LABEL OF THE GROUP

Select the group that you want to change, then over-type the text in the label edit box.

CHANGING THE MEMBERS OF THE GROUP

A tick next to a port's label signifies that it is a member of the selected group.

Clicking on the check box next to the label of each port toggles the check.

ANTENNAS TAB

Due to propagation delays along the cables, antennas which are in close proximity but which have effective cable lengths which differ by more than approximately 150m can interfere with each other. This screen allows you to compensate for the length of the connection of each of the 10 available antennas.

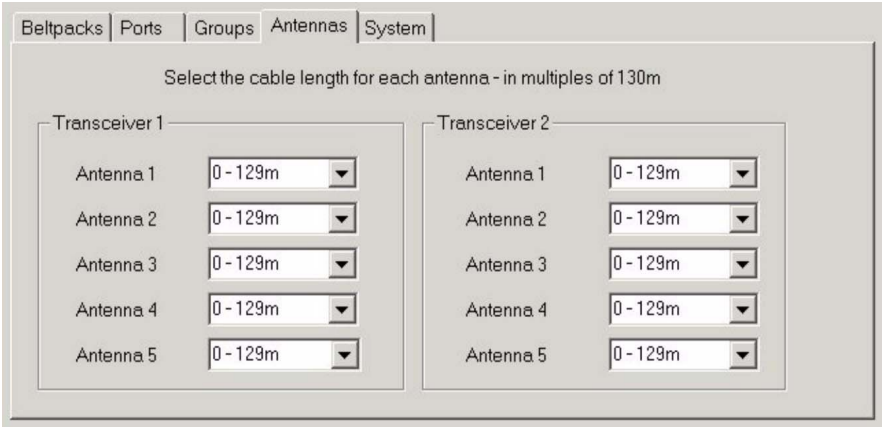


Figure 10-10: Antennas Tab

SYSTEM TAB

Enter the IP address to be assigned to the basestation. This address will become effective on a map download that restarts the basestation.

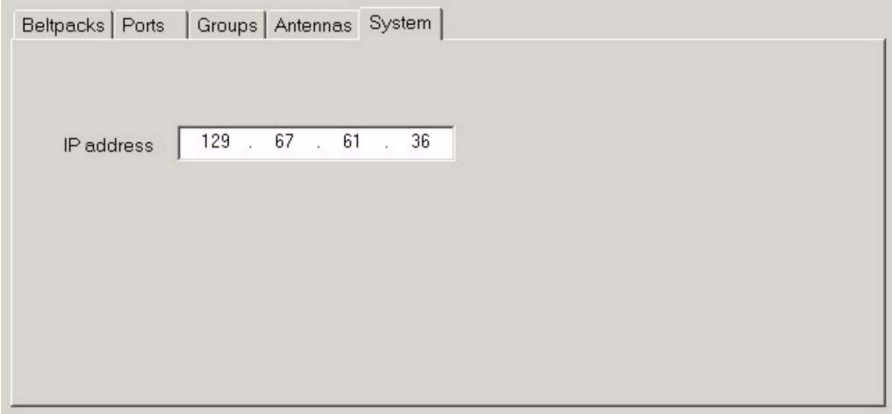


Figure 10-11: System Tab

CELLCOM TOOLKIT

INTRODUCTION

The Cellcom Toolkit is a suite of PC programs running under Windows 95 or above, designed to allow you to set up, backup, and upgrade your Cellcom base unit. It consists of the following tools:

Beltpack registration

This is used to associate a beltpack with a particular base station.

Configuration controller

Used to back up and restore base station configurations made from the base station front panel.

Serial Firmware Upgrader

Upgrades the base station firmware when a new version is released via the Serial cable.

Ethernet Firmware Upgrader

Upgrades the base station firmware when a new version is released via the Ethernet port.

TOOLKIT INSTALLATION

To install the CellCom toolkit follow the link on the installation/upgrade CD and click on the installation executable. The following installation startup screen will be displayed.

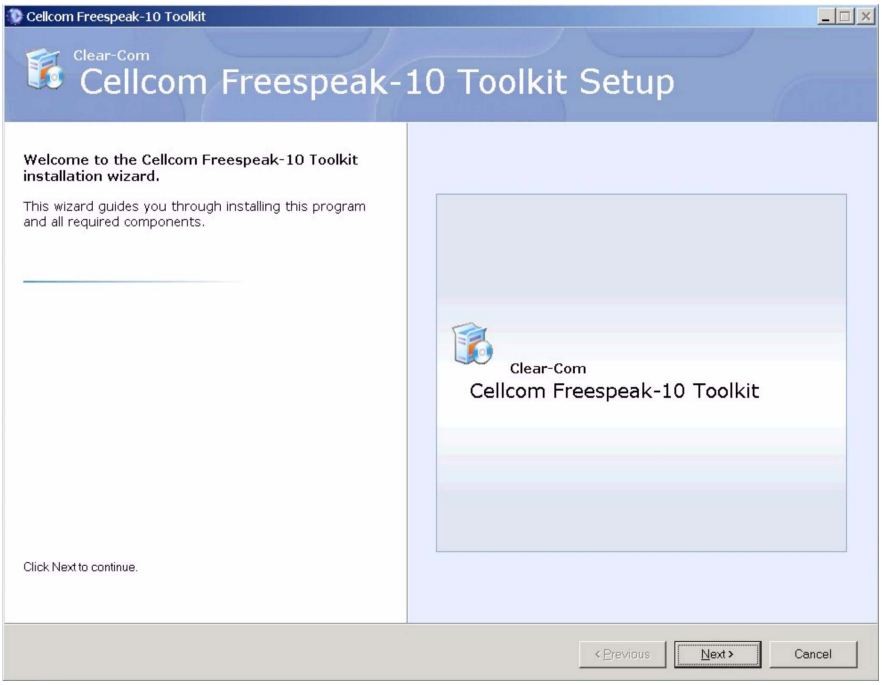


Figure 11-1: Toolkit Install Startup

Click on the 'Next' button to continue the installation. The installer will request a name for identification and company name.

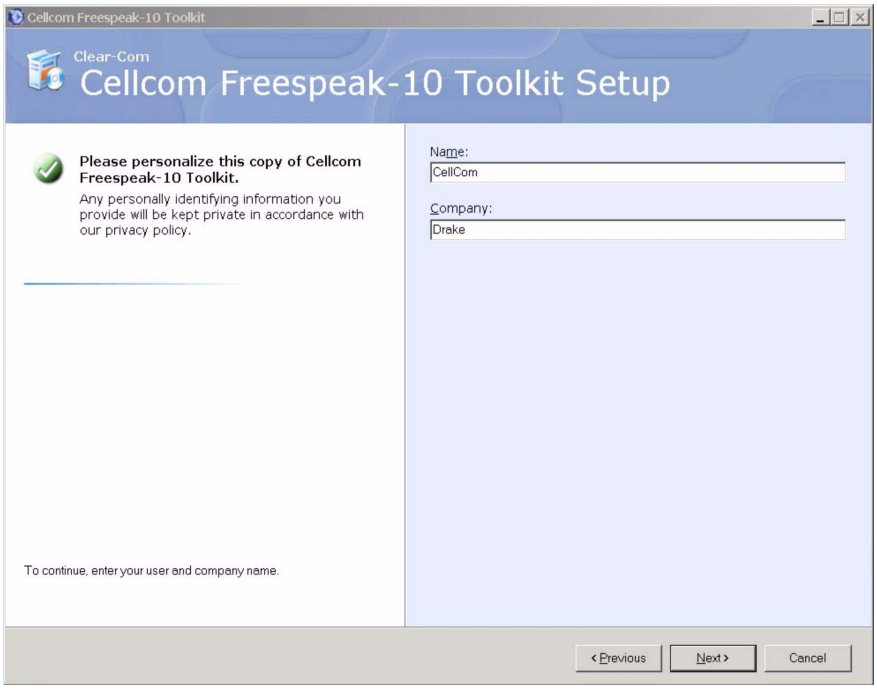


Figure 11-2: Toolkit Installer Names

Enter the required information and click on the 'Next' button. The installation requirements screen will be displayed by the installer.

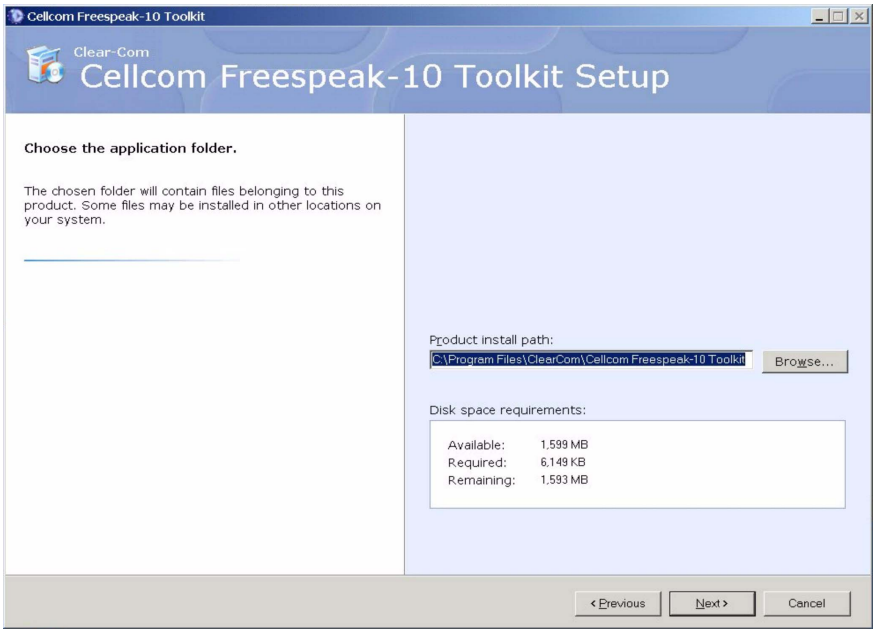


Figure 11-3: Toolkit Installation Path

Either accept the proposed installation path or use the 'Browse' function to select a new installation path. Check that there is sufficient space available to complete the toolkit installation and click on the 'Next' button to continue the installation. The toolkit shortcuts setup screen will be displayed.

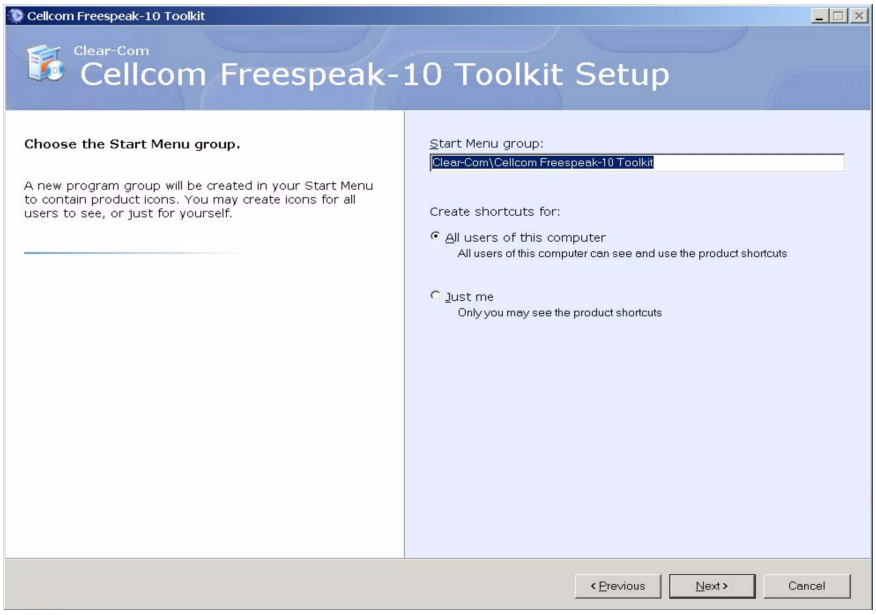


Figure 11-4: Toolkit Start Menu Setup

Either accept the default start menu name or enter a new menu. Select whether all users or just the installing user should be able to see the toolkit shortcuts and click on the 'Next' button to continue. The installer confirmation screen will be displayed.

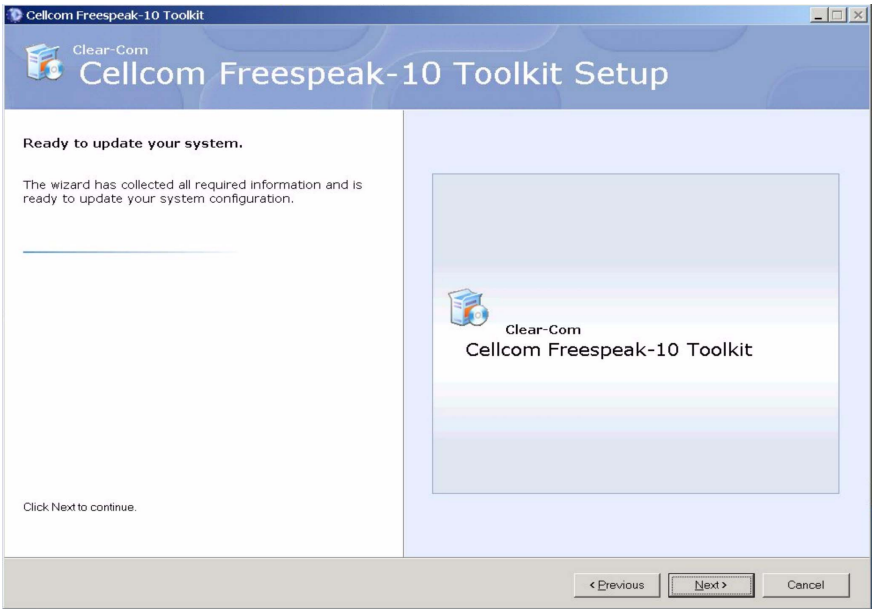


Figure 11-5: Toolkit Install Confirm

Click on the 'Next' button to install the toolkit. The toolkit software will be installed and a completion screen will be displayed.

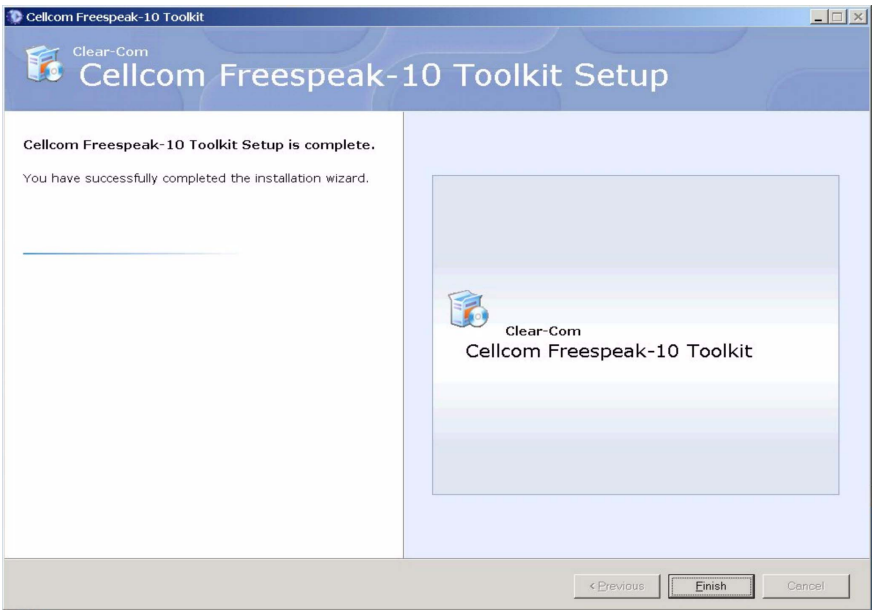


Figure 11-6: Installation Completion Display

Click on the 'Finish' button to complete the itoolkit nstallation.

BELTPACK REGISTRATION

Registration is the process of telling the beltpacks which base station to communicate with, and telling the base station which beltpacks to communicate with.

In some cases the beltpacks shipped to you with your base station may already be registered to it, in which case you do not need to use this tool immediately. However you will need to use it if they are not registered, or if you are shipped new beltpacks to replace faulty or damaged ones, or if you own a number of base stations and wish to switch beltpacks between them.

The registration process involves two steps: firstly entering the beltpack serial numbers into the base station, and secondly programming the beltpacks with the base station system ID.

ENTERING BELTPACK SERIAL NUMBERS INTO THE BASE STATION

- From the base station front panel, select "BELTPACKS", and then the "slot" of the beltpack that you want to put the new unit in, e.g. BPK01.
- Select RGSTR. You should now see a menu titled "Enter beltpack S/N for…" with 4 digits underneath.
- Each beltpack should have a sticker on its rear indicating its serial number. (If this sticker is missing or damaged, this serial number can be read using the PC app – see later). Dial the last 4 digits of this serial number into the base unit, then select BACK, then BACK again to return to the list of beltpack slots.
- Repeat the process for all the beltpacks that you want to register.
- Apply the changes by either holding down the rotary controller for 5 seconds (this must be done after you have selected BACK from the Register menu) or by selecting "SYSTEM>SAVE" from the main base station menu.

To de-register a beltpack, from the base station front panel, select BELTPACKS, then the slot where the beltpack is currently registered, then RGSTR, and enter "0 0 0 0" as the serial number.

ENTERING THE BASE STATION SYSTEM ID INTO THE BELTPACK

- Connect the beltpack to the PC using the beltpack serial cable (9 way female DIN to 3.5mm stereo jack). If one of these cables was not shipped with your Cellcom unit, the pinout is described in the Figure 11-2. Power up the beltpack.
- Run the beltpack registration application, and select the COM port that you have attached the serial cable to on the PC. If the beltpack communicates correctly with the PC, after a few seconds you should see a display similar to this:

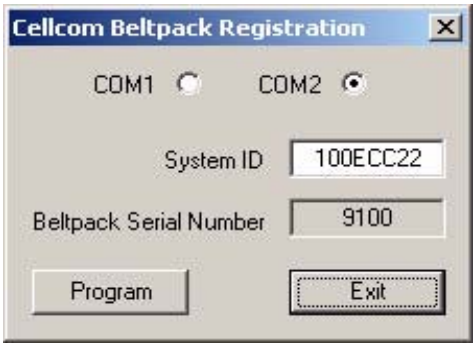


Figure 11-7: Base Station ID

- As you can see the serial number is also displayed as a read-only value – this can be useful if the sticker on the back of the beltpack is missing or damaged.
- If the communication is not successful, the system ID and serial number will remain as dashes:

Figure 11-8: Communication Failure

- In this case check the cable and COM port.
- On the Cellcom base station, select “SYSTEM->INFO”. Along with the firmware version number and the IP address, the System ID should be displayed as a 7 character alphanumeric value. Enter this number into the System ID box of the PC beltpack registration application, and press the Program button. The application will automatically read back the value stored in the beltpack to check that it has been written correctly.
- Repeat the process for all the beltpacks that you want to register. There is no need to exit the registration application before removing the serial cable from the beltpack – it will automatically detect when a new beltpack is connected.
- Power cycle the base station and the beltpacks, and check that they communicate successfully with each other.

CELLCOM CONFIGURATION CONTROLLER

The Configuration Controller allows you to back up and restore configurations that you have made on the base station front panel to a PC. It can also be used to "clone" the configuration of one base station onto another, but be aware that the configuration includes beltpack registrations and the system ID, so beltpacks will be registered to both base stations, which can cause conflicts.

It connects to the base unit using a crossover (Null-Modem) serial cable plugged into the "PC PROGRAM" port. If this cable was not shipped with your Cellcom unit, the pinout is described in Figure 11-1.

The maps generated by the Configuration Controller are compatible with those generated by the Configuration Editor (see chapter *"CellCom 10 Configuration Editor"*.

SELECTING THE PC COM PORT

Use the COM port drop-down box to select the COM port that the serial cable is plugged into on the PC. Click on the arrows next to the dropdown to select the required port.

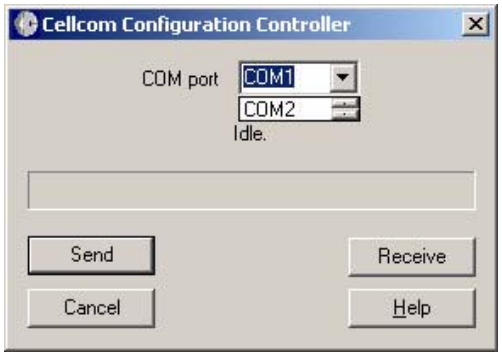


Figure 11-9: Select PC COM Port

BACKING UP A CONFIGURATION FROM THE BASE STATION

Click the "Receive" button.

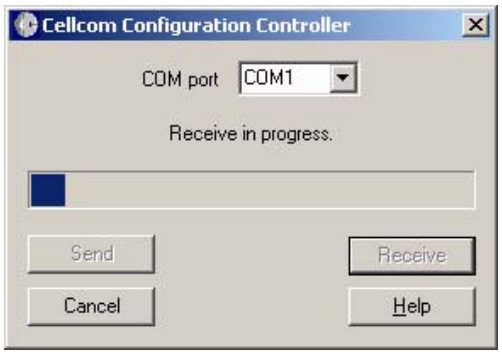


Figure 11-10: Configuration Backup

If the communication with the base unit starts successfully, the status text will change to “Receive in progress”, and the progress bar will begin to advance.

If the PC is unable to communicate with the base station, after a couple of seconds an error dialog will be displayed.

Figure 11-11: Communication Timeout

If this occurs, check that you have a Null Modem cable, and check the PC and base station connections.

The reception of the configuration file should take about one and a half minutes. After this time, a dialog box will pop up asking you to save the configuration file to the PC.

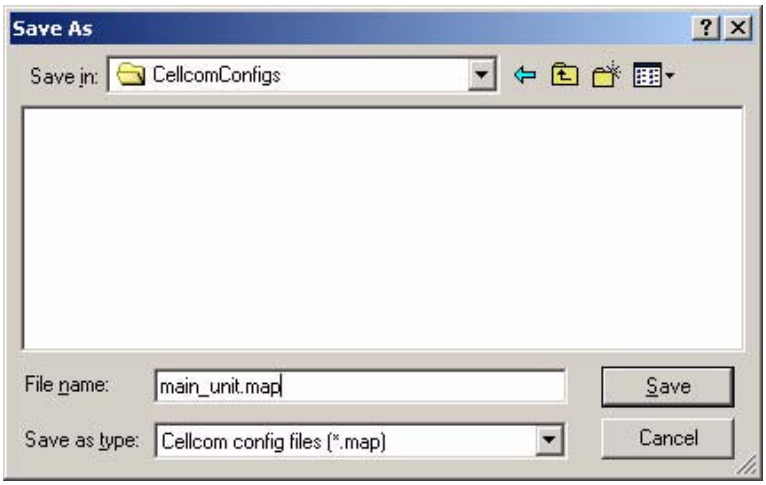


Figure 11-12: Saving the Configuration File

There is no way of examining the contents of the configuration file using this program, so you should choose a filename which helps you remember what the contents are. Make sure that you save the file with a “.map” extension.

The configuration of the base station has now been backed up.

RESTORING A CONFIGURATION TO THE BASE STATION

Press the Send button. A dialog box will pop up asking you to select a configuration file to send.

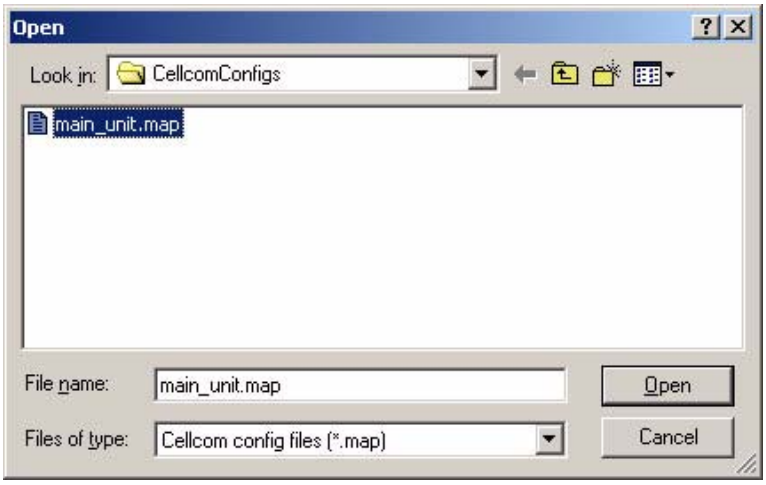


Figure 11-13: Restoring a Configuration File

Select a file, then press Open. The program will ask you if you are sure that you want to overwrite the configuration in the base station.

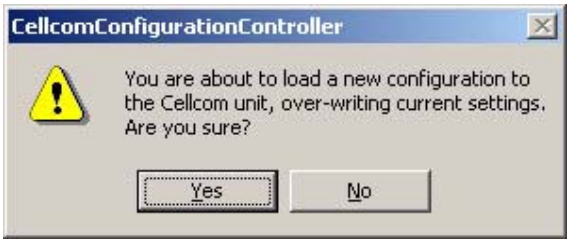


Figure 11-14: Confirm New Configuration

Click Yes.

If the program cannot communicate with the base station, an error dialog will be shown. If this occurs, check the PC serial port is correct, make sure you have a Null Modem cable, and check the PC and base station connections.

If it does communicate with the base station successfully, the status text will change to “Send in progress”, and the progress bar will begin to advance.

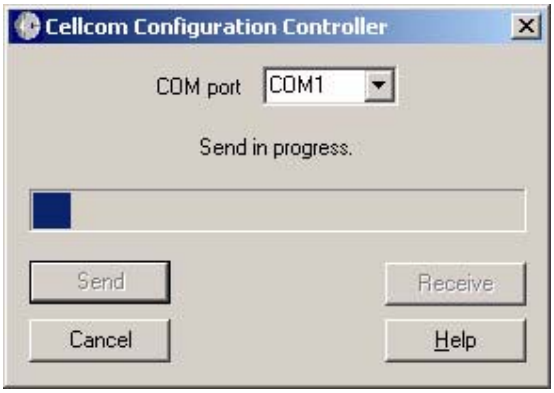


Figure 11-15: Save New Configuration

When the send is complete, the status text should change to “Completed OK”, and the base station will reboot after a few seconds.

SERIAL UPGRADER

This application is used to upgrade the firmware of the Cellcom base unit when a new version is released.

It connects to the base unit using a crossover (Null-Modem) serial cable plugged into the “PC PROGRAM” port. If this cable was not shipped with your Cellcom unit, the pinout is described in Figure 11-1. It expects to be connected to COM port 1 of the PC.

UPGRADING THE BASE UNIT FIRMWARE

On launching the application you should see a dialog box like this appear.

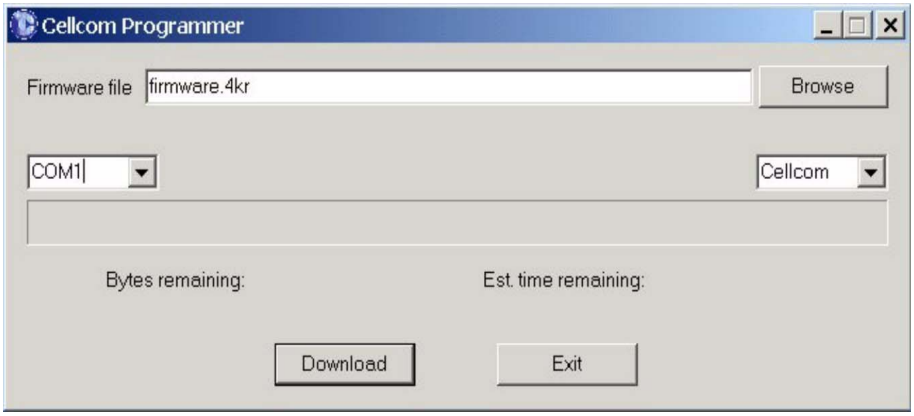


Figure 11-16: Upgrading Base Unit Firmware

Select “Browse”, and navigate to the location of the new base unit firmware file. The firmware file will have a “.4kr” file extension.

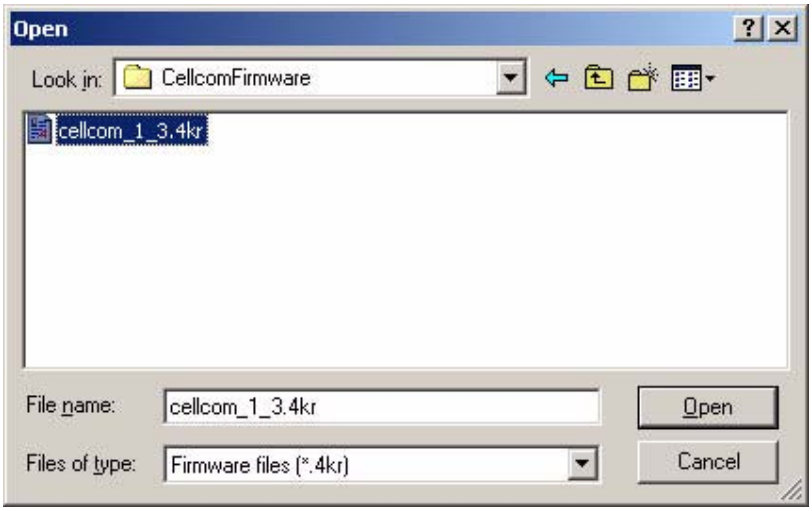


Figure 11-17: Select Firmware File

Select the file, then press "Open". The main application dialog box will now show the date of the new file, as below.

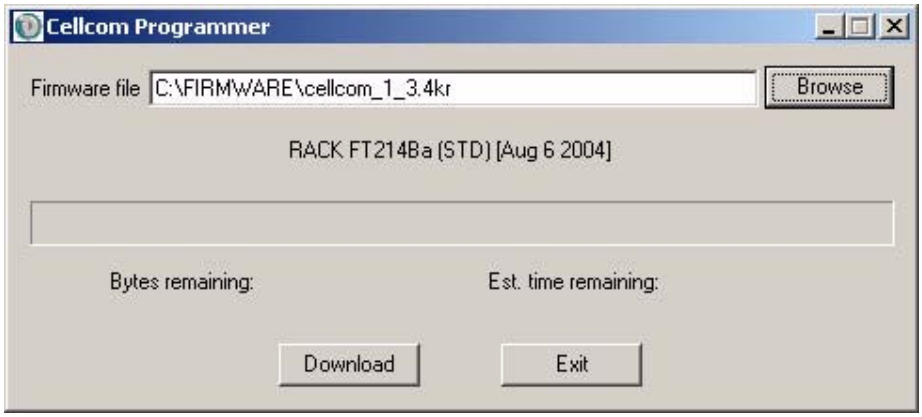


Figure 11-18: Firmware Download

Press "Download" to start the download process. If the program communicates successfully with the base station, the progress bar will start to advance. Diagnostic messages indicating that a download is in progress will also appear on the base unit front panel display.

Download of the file should take around fifty minutes to an hour to complete.

If the program fails to communicate with the base station, after a few seconds an error dialog will be displayed:

Figure 11-19: Download Timeout

If this occurs, check the serial cable and all connections.

The download process can be aborted at any time without harm to the Cellcom unit by pressing the "Exit" button. The Cellcom unit can also be powered off safely except when "Firmware successfully downloaded – Flashing and running" is displayed on the front panel display.

ETHERNET UPGRADER

This application is used to upgrade the firmware of the Cellcom base unit when a new version is released. It is an alternative to the Serial Upgrader offering faster download times – typically upgrade is completed in around 3 minutes.

Cellcom base station firmare version 1.3 or above needs to be present in the Cellcom base unit in order to use the Ethernet upgrader program.

CONNECTING THE UNIT TO THE PC

A direct connection to the PC using a crossover Ethernet cable or a hub should be used. The PC used must also have it's IP address changed to be on the same subnet as the Cellcom base unit – e.g. if the IP address of the base unit is 192.168.42.150, the IP address of the PC could be set to anything from 192.168.42.0 to 192.168.42.149, and 192.168.42.151 to 192.168.42.255. See the Windows help documentation on "TCP/IP Settings" on how to do this for your version of Windows. The IP address of the base station is found by selecting SYSTEM->INFO from the base station front panel menu. The base station IP address can be changed from the front panel via the system menu (see chapter 5 of this manual).

RUNNING THE PC PROGRAM

Once the base station and PC are connected and powered up, run the Ethernet Upgrader program. A dialog box like this should appear:

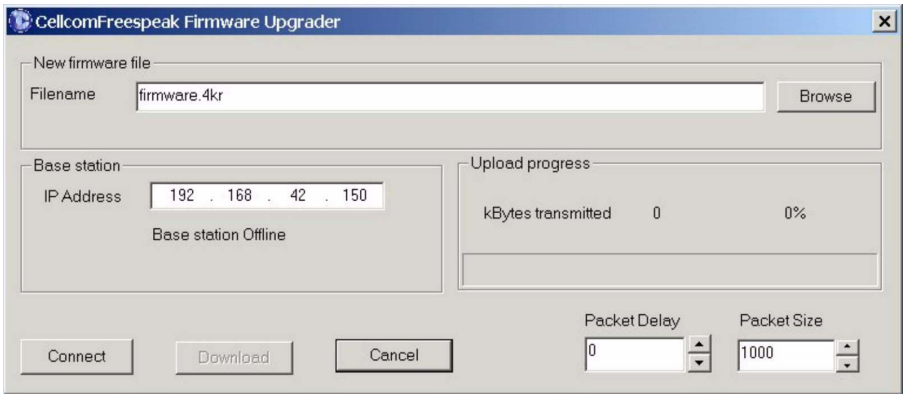


Figure 11-20: Ethernet Firmware Upgrader

Enter the IP address of the base station into the "IP Address" box. If the program fails to communicate with the base station, the display will remain as above. If it does connect, the display will change as follows: (Note that the base station needs to be powered on for about 20 to 30 seconds before it will start communicating over Ethernet).

The Packet Delay and Packet Size parameters should not require adjusting under normal circumstances and should be left at the default values of 0 delay and 1000 packet size for optimum performance.

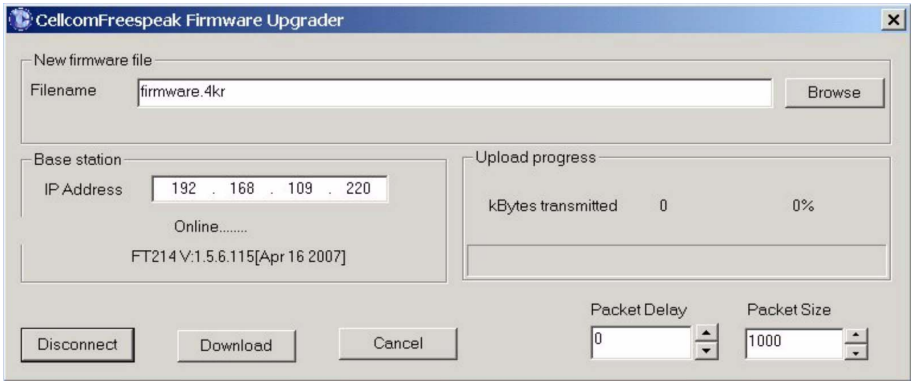


Figure 11-21: Firmware Upgrade Over Ethernet

Select "Browse", and navigate to the location of the new base unit firmware file. The firmware file will have a ".4kr" file extension.

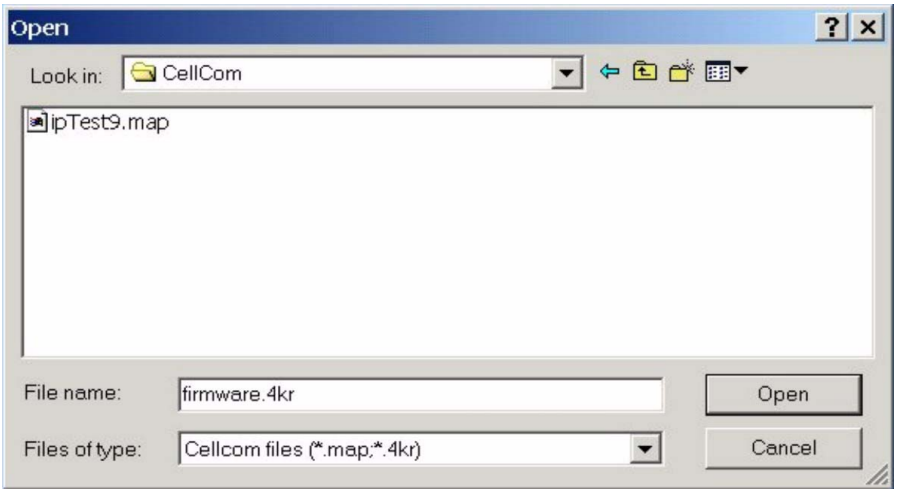


Figure 11-22: Browse to Firmware File

Select the file, then press "Open". The main application dialog box will now show the date of the new file, as below.

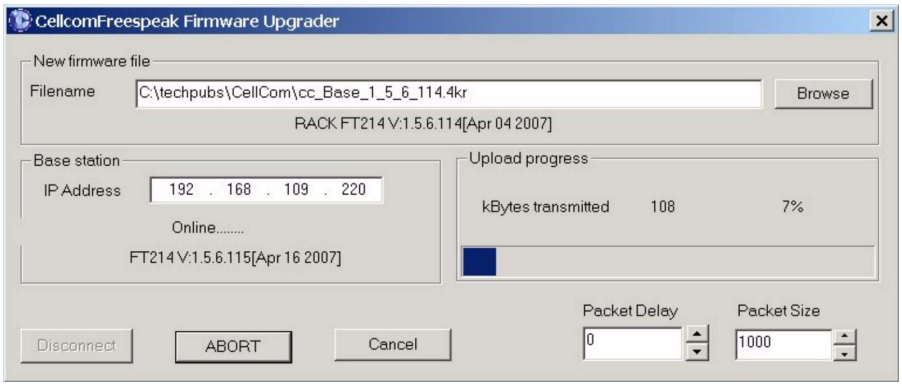


Figure 11-23: Firmware Download

Press the "Download" button to start the download procedure. After a few seconds the progress bar should start to advance, and the "kBytes transmitted" and % completed displays should be updated.

Download should take 1 - 3 minutes to complete.

If the "kBytes transmitted" display changes to "Failed", power cycle the Cellcom unit, wait for it to be detected again, and press the "Start Download" button.

The download process can be aborted at any time without harm to the Cellcom unit by pressing the "Cancel" or "Abort" button. The Cellcom unit can also be powered off safely except when "Firmware successfully downloaded – Flashing and running" is displayed on the front panel display.

BASE STATION PROGRAMMING SERIAL CABLE PINOUT

Standard Null-modem cable with data Send and Receive crossed over.

PC Connection usually 9 way Female D-type connector	Base station connection 9 way Male D type connector
1	N/C
2	3
3	2
4	N/C
5	5
6	N/C
7	N/C
8	N/C
9	N/C

Table 11-1: Null-Modem Cable Pinout

BELTPACK PROGRAMMING SERIAL CABLE PINOUT

PC Connection usually 9 way Female D-type connector	Beltpack connection 3.5mm Stereo jack plug
1	N/C
2	Tip
3	Ring
4	N/C
5	Screen
6	N/C
7	N/C
8	N/C
9	N/C

Table 11-2: Beltpack Programming Serial Cable Pinout

12 SPECIFICATIONS

CellCom 10 CEL-BASE Base Station

Base-to-Beltpack Frequency Response	100 Hz – 7.1 kHz
Number of CEL-BP Beltpacks per Base Station	10
Number of CEL-TA Transceiver/ Antennas Supported by Base:	10
Number of Transceiver/Antenna Ports	2
Number of Base Loop Ports	1 (combines 2 bases into one 20-beltpack system)
Programming Port	DB9
Relay Port	DB9; normally open and normally close wiring
Party-Line Intercom A and Intercom B (each)	XLR-3F with XLR-3M loop through, on/off termination switch (via software), Clear-Com RTS selection (via software)
4-Wire/Matrix Connection	4 RJ-45 for 4-wire (Intercom 3 – 6)
Program Input	XLR-3F, transformer isolated, line-level input
Stage Announce Output	XLR-3M, transformer isolated, line-level output
Front-Panel Headset	4-pin male connector with 2-channel, mono-summed capability and individual talks and listens
Front Panel Display	254 x 32 dot-graphic VFD
Front Panel Indicators	2 Talk LED's for front-panel headset; CH A and B party-line enable LED's; Program Input enable LED; 10 individual beltpack LEDs
Base-Station Programming/Editing	Push-to-enter rotary encoder

Dimensions	1-RU unit, 44 x 483 x 312 mm (hwd) (1.75 x 19.0 x 12.5 inches)
Weight	Approx. 10 lb.

CellCom 10 CEL-BP Beltpack

Beltpack Frequency Response	100 Hz – 7.1 kHz
Beltpack Assignment-Select Buttons	3, used to scroll and select talk/listen "pages" and also to edit beltpack menu options
"Label" Assignments per Select Button	2 (two simultaneous talk/listen paths or channels)
Number of Full-Duplex Audio Paths	6 (3 pairs), with individual level control
Level/Talk Controls	2 top-mounted push-to-talk rotary encoders
Headset Connector	4-pin male, Clear-Com standard
Microphone Type	Dynamic or electret, selectable in beltpack menu
Microphone and Headset Limiters	Selectable in beltpack menu
Powering	Alkaline Battery, 4 AA alkaline cells Rechargeable, 4 NiMH cells in AA format
Battery Charging	In unit, via supplied external power supply connected to beltpack
Battery Life	Approximately 8 hours with 4 fresh AA alkaline batteries or 4 AA high-amperage NiMH cells
Range from Single CEL-TA Transceiver/Antenna	125 m from transceiver/antenna in line-of-sight conditions; 50 m indoors; use multiple CEL-TAs for larger, custom coverage areas
Dimensions	Tapered design, at largest points approx. 38 x 87 x 144 mm (dwh) (1.5 x 3.5 x 5.75 inches)
Weight (with batteries)	Approx. 13 oz.

Transceiver/Antenna

Beltpacks Supported Per Transceiver/Antenna	5, in one cellular zone
Transceiver Antenna Transmission Range	Up to 250 m (800 ft.), line of sight
Maximum Distance, Base to Transceiver Via Base Port	1,000 m (3,200 ft.) using 24 AWG cable 500 m (1,600 ft) using 26 AWG cable
Maximum Distance, Transceiver Powered By Base Port	300 m (975 ft.)
Local Powering	Via 24VDC power supply
Range per CEL-TA Transceiver/Antenna	150 m from transceiver/antenna ideal, line-of-sight conditions; 50 m indoors; use multiple CEL-TAs for larger, custom coverage areas
Connection to CellCom 10 Base	RJ-45
Mounting	Via integral tabs with holes for screws
Dimensions	38 x 125 x 153 mm (dwh) (1.5 x 5.0 x 6.1 inches)
Weight	Approx. 9 oz.

Transceiver/Antenna Splitter

Number of Transceiver/Antennas Supported	10; ***Note:*** *In the USA, until FCC opens the allowed bandwidth, any one area can only have 5 antennas.*
Number of Splitters Per Base	2
Connection Between Base and Splitter	4-pair CAT5 cable with RJ-45
Connection Between Splitter and Transceiver/Antennas	4-pair CAT5 cable with RJ-45
Powering of Splitter	Locally powered via external power supply

Transmission Method

Method of RF Operation	DECT standard, using two DECT bands per beltpack for wider frequency response
Modulation	QPSK
Frequencies of Operation	1.92 – 1.93 GHz
RF Output	250 mW burst, average level 2 - 4 mW

Theory of Operation
Dynamic allocation of frequencies and handoff of beltpacks among the transceiver/antennas up to their individual limit of 5 connected beltpacks at a time; each beltpack is assigned a “virtual port” within the CellCom 10 base.

APPENDIX 1: DECT CARRIER FREQUENCY CHART

RFC	CARRIER FREQUENCY	RFC	CARRIER FREQUENCY
0	1897.344	17	1911.168
1	1895.616	18	1912.896
2	1893.888	19	1914.624
3	1892.160	20	1916.352
4	1890.432	21	1918.080
5	1888.704	22	1919.808
6	1886.976	**23***	**1921.536**
7	1885.248	**24***	**1923.264**
8	1883.520	**25***	**1924.992**
9	1881.972	**26***	**1926.720**
10	1899.072	**27***	**1928.448**
11	1900.800	28	1930.176
12	1902.528	29	1931.904
13	1904.256	30	1933.632
14	1905.984	31	
15	1907.712	32	
16	1909.440		

Table 13-1: DECT Carrier Frequency Chart

*** Carriers 23 through 27 are those used in the USA.**

APPENDIX 2: OVERVIEW OF PROGRAMMING MENUS

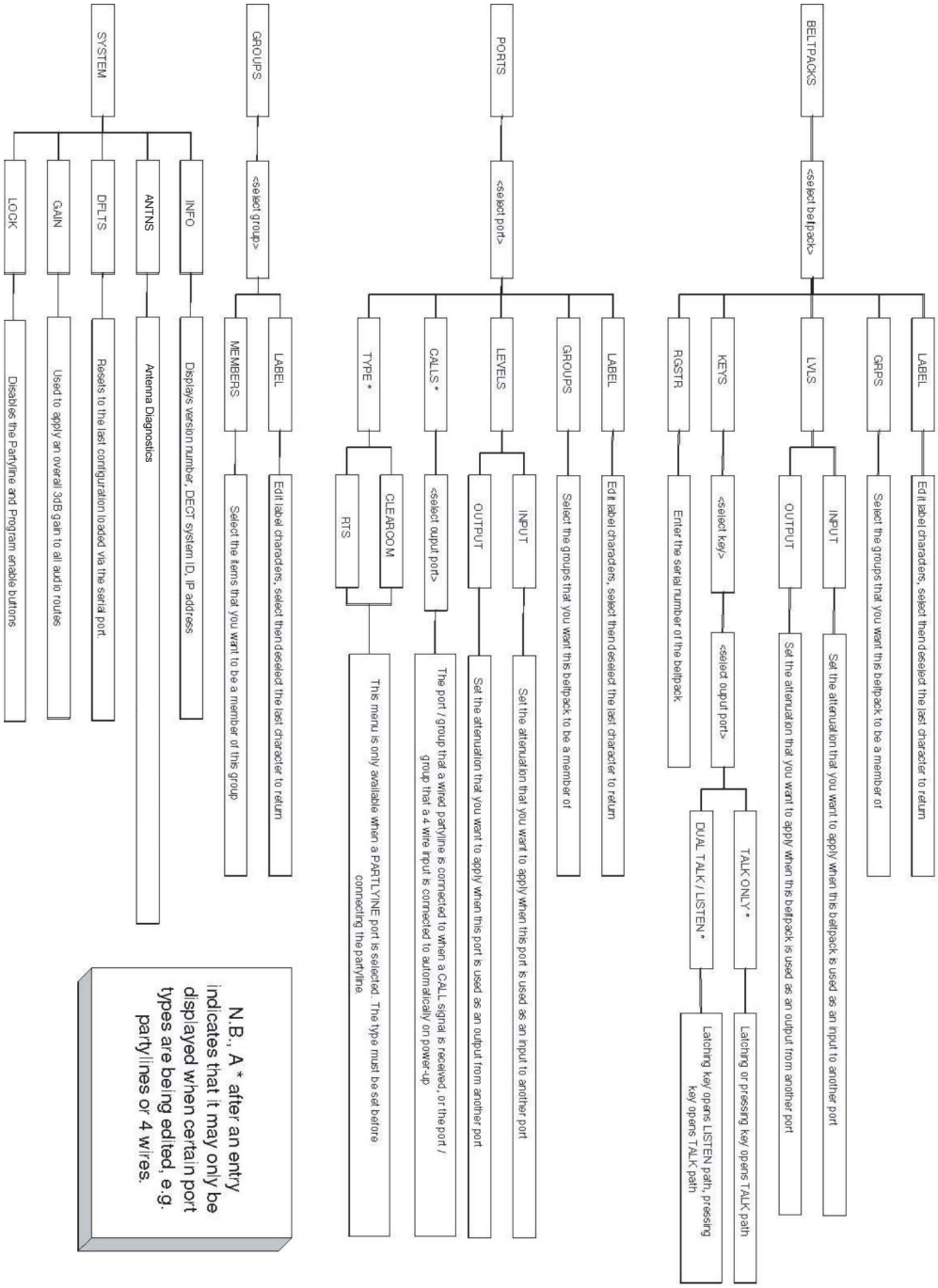


Figure 14-1: Programming Menus

LIMITED WARRANTY

Vitec Group Communications (VGC) warrants that at the time of purchase, the equipment supplied complies with any specification in the order confirmation when used under normal conditions, and is free from defects in workmanship and materials during the warranty period.

During the warranty period VGC, or any service company authorized by VGC, will in a commercially reasonable time remedy defects in materials, design, and workmanship free of charge by repairing, or should VGC in its discretion deem it necessary, replacing the product in accordance with this limited warranty. In no event will VGC be responsible for incidental, consequential, or special loss or damage, however caused.

VGC offers 24 x 7 customer support if you have an Extended Warranty or Service Contract.

Return Material Authorization (RMA) numbers are required for all returns.

Both warranty and non-warranty repairs are available.

WARRANTY PERIOD

The product may consist of several parts, each covered by a different warranty period. The warranty periods are:

- Cables, accessories, components, and consumable items have a limited warranty of 90 days.
- Headsets, handsets, microphones, and spare parts have a limited warranty of one year.
- UHF wireless IFB products have a limited warranty of one year.
- UHF wireless intercom systems have a limited warranty of three years.
- All other Clear-Com and Drake brand systems and products, including beltpacks, have a limited warranty of two years.

The warranty starts at the time of the product's original purchase. The warranty start date for contracts which include installation and commissioning will commence from the earlier of date of the Site Acceptance Test or three months from purchase.

TECHNICAL SUPPORT

To ensure complete and timely support to its customers, VGC's User Support Center is staffed by qualified technical personnel. Telephone and email technical support is offered worldwide by the User Support Center.

The User Support Center is available to VGC's customers during the full course of their warranty period. Telephone support during the warranty period will be offered at no charge between 09:00 and 17:00 according to the customer's local time zone.

In addition, for customers who purchase an Extended Warranty or Service Contract, 24-hour customer support is offered immediately upon purchase of

such agreement. For more information, contact your authorized dealer, distributor, or sales representative.

Instructions for reaching our User Support Center are given below.

Telephone for Europe, Middle East and Africa: +49 40 6688 4040

Telephone for the Americas and Asia: +1 510 337 6600

Email: vitec.support@AVC.de

Once the standard warranty period has expired, the User Support Center will continue to provide telephone support if you have purchased an Extended Warranty or Service Contract. In these cases, you will have access to telephone support 24 hours per day, 7 days per week.

WARRANTY REPAIRS AND RETURNS

Before returning equipment for repair, contact a User Support Center to obtain a Return Material Authorization (RMA). Our representatives will give you instructions and addresses for returning your equipment. You must ship the equipment at your expense, and the support center will return the equipment at our expense.

For out-of-box failures, use the following contact information:

Europe, Middle East and Africa

Tel: +44 1223 815000 Email: customerservicesEMEA@vitecgroup.com

North America, Canada, Mexico, Caribbean & US Military

Tel: +1 510 337 6600 Email: customerservicesUS@vitecgroup.com

Asia Pacific & South America

Tel: +1 510 337 6600 Email: customerservicesAPAC@vitecgroup.com

VGC has the right to inspect the equipment and/or installation or relevant packaging.

NON-WARRANTY REPAIRS AND RETURNS

For items not under warranty, you must obtain a RMA by contacting the User Support Center. Our representatives will give you instructions and addresses for returning your equipment.

You must pay all charges to have the equipment shipped to the support center and returned to you, in addition to the costs of the repair.

EXTENDED WARRANTY

If you purchase an Extended Warranty, you are also given access free of charge to the User Support Center 24 hours a day, 7 days a week.

You can purchase an extended warranty at any time during the first two years of ownership of the product. The purchase of an extended warranty extends to five

years the warranty of any product offered with a standard two-year warranty. The total warranty period will not extend beyond five years. Any purchase of an extended warranty provides 24 x 7 customer support in addition to the warranty immediately upon purchase of the warranty extension.

Note: VGC does not offer warranty extensions on UHF wireless intercom systems, or on any product with a 1-year or 90-day warranty.

SERVICE CONTRACT

VGC also offers service contracts that provide 24 x 7 telephone support, advance replacements, training, proactive maintenance, on-site visits, and no charge for repair or replacement of equipment. For more information, contact your authorized dealer, distributor, or sales representative.

LIABILITY

THE FOREGOING WARRANTY IS VGC'S SOLE AND EXCLUSIVE WARRANTY. THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY OTHER REQUIRED IMPLIED WARRANTY SHALL EXPIRE AT THE END OF THE WARRANTY PERIOD. THERE ARE NO OTHER WARRANTIES (INCLUDING WITHOUT LIMITATION WARRANTIES FOR CONSUMABLES AND OTHER SUPPLIES) OF ANY NATURE WHATSOEVER, WHETHER ARISING IN CONTRACT, TORT, NEGLIGENCE OF ANY DEGREE, STRICT LIABILITY OR OTHERWISE, WITH RESPECT TO THE PRODUCTS OR ANY PART THEREOF DELIVERED HEREUNDER, OR FOR ANY DAMAGES AND/OR LOSSES (INCLUDING LOSS OF USE, REVENUE, AND/OR PROFITS). SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR THE LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. IN ANY EVENT, TO THE MAXIMUM EXTENT PERMITTED UNDER APPLICABLE LAW, VGC'S LIABILITY TO CUSTOMER HEREUNDER SHALL NOT UNDER ANY CIRCUMSTANCES EXCEED THE COST OF REPAIRING OR REPLACING ANY PART(S) FOUND TO BE DEFECTIVE WITHIN THE WARRANTY PERIOD AS AFORESAID.

This warranty does not cover any damage to a product resulting from cause other than part defect and malfunction. The VGC warranty does not cover any defect, malfunction, or failure caused beyond the control of VGC, including unreasonable or negligent operation, abuse, accident, failure to follow instructions in the manual, defective or improperly associated equipment, attempts at modification and repair not approved by VGC, and shipping damage. Products with their serial numbers removed or defaced are not covered by this warranty.

This warranty does not include defects arising from installation (when not performed by VGC), lightning, power outages and fluctuations, air conditioning failure, improper integration with non-approved components, defects or failures

of customer furnished components resulting in damage to VGC provided product.

This warranty gives you specific legal rights and you may have other rights which vary from state to state.