Chapter 13: Autopatch Routines

Configuring the Autopatch:

Command 110 is used to enable and configure the autopatch. It allows you to specify which radio port the autopatch is plugged in to and whether or not you want the autopatch to speak the number it is about to dial using the synthesized voice. If you select to have the number read back, you can choose whether it should read it back "politely" (so it can be interrupted by kerchunking) or "impolitely" (so it always reads back the whole number). See command 044 in Ch 6 for DTMF regenerate parameters.

Autopatch Up Commands:

There are several different commands that can be used to place a call using the autopatch. All of them connect the port that the command was entered from (and any ports connected to it) to the autopatch. These commands should not normally be executed from the serial port or by the scheduler (because there is no way to connect the audio to them). They are:

• Manual Off Hook: Command 111. This command connects the radio port to the phone line without dialing any numbers. You can dial phone numbers without DTMF regeneration by executing this command, waiting for dial tone, and entering the number on your DTMF pad. Since the tones are not captured and regenerated but go out directly onto the phone line, there is no long distance checking, etc.

• Normal Forward Dial: Command 112. This command is the one you would usually make available to users. Three digit numbers will access autodial slots, 4 through 11 digit numbers will be checked against the dialing tables (explained later), then regenerated over the phone line. If you have specified pre-dial digits (such as a '9' to get out of a local PBX) with Command 116, they will be dialed first.

• Special Forward Dial: Command 113. This command is similar to the normal forward dial but it bypasses the dialing table checks. It is the most convenient way to bypass all of the long distance checking. It will dial any predial digits that you have programmed with Command 116.

1. Two-Stage Patch: Macro 552. The user can execute this macro, unkey and hear dial tone, then key up again to enter a phone number. The phone number will be processed by command 112, which will check it against the long-distance dialing tables and regenerate the DTMF digits. For users that aren't used to entering the patch up code (often '*') and phone number all at once before unkeying, this macro may reduce confusion.

Using '*' for the Autopatch Up Command:

You can use the '*' digit to execute any of the above autopatch commands. Simply rename your autopatch command to a '*' using Command 010 ("010 112 *" for example). This will allow you to use the patch by simply keying up, pressing '*' and the phone number you wish to dial, then unkeying.

Macro 552 and command 112 can both be named the same thing (such as '*') without causing problems. The controller knows that command 112 requires more digits to be entered at the same time as the DTMF command name and that macro 552 does not, so it will execute the appropriate command automatically.

Hanging Up:

No matter which command was used to bring up the autopatch, Command 114 will hang it up. If you want to have more than one hang up command, just make several different macros call Command 114. You can rename command 114 to '#' by entering "010 114 #" unkey, 'D' or <Enter>.

Command 115 can also be used to hang up the patch. It differs from command 114 in that it will not hang up the patch from a radio port that is not part of a call in progress. For example: port 1 and port 2 are running independent repeaters (they aren't connected), and port 1 makes an autopatch call. Port 2 continues to operate normally, unaware that the autopatch is in use. Then someone on port 2 decides to make a call on the patch and gets the autopatch busy message. Rather than waiting for the user on port 1 to finish their call, the person trying to make a call on port 2 decides to hang up the patch so he can make his own call. If he uses command 115, the controller will not hang up the patch because port 2 is not connected to the autopatch. If he uses command 114, it will. Either command will work to hang up the patch if they are entered from port 1, the port that made the call. Often command 115 is used as the primary hang up command and command 114 is reserved as a control operator command, to be used only when an emergency mandates hanging up someone else's call. Resetting the controller with command 035 also hangs up the patch and can be executed from any radio port.

Connected Ports:

 If an autopatch call is placed from a port that is in a group (connected to other ports), the autopatch will also be placed in that group for the duration of the call so that all of the connected ports will be able to hear the conversation. If an autopatch call is placed from a port that is *not* in a group, by default the controller will put both that port and the autopatch port into group 3 (to connect them together). You can change which group is used for that purpose by editing the before-patch-off-hook macro (see Chapter 8).

Predial Digits:

Autopatches that are on a PBX often have to dial a '9' or some other combination of digits to reach the outside world. The RLC-DSP404 has the ability to dial these digits for you. You can tell it what digits to dial and how long of delays to use before and after these "predial digits" with Command 116. These digits will be dialed before every number that is dialed with the forward dial commands. You can choose whether or not they should be dialed before each autodial number. This allows you to dial numbers that do not require the predial digits by putting them in an autodial slot.

The Autodialer:

There are 501 autodial slots that can each hold up to an eighteen digit phone number. They are numbered 0 through 500. They can be accessed by executing either of the forward dial commands with the number of the autodial slot you want to dial. They can be programmed with Command 124. You can find out what number is in an autodial slot with Command 125. You can select whether or not the predial digits (set with Command 116) get sent before the autodial number with Command 126. This is useful for those using a PBX because it allows them to have some autodial slots go to internal numbers and some to dial the predial digits to get to the outside world. Command 127 allows you to enable or disable the use of an autodial slot. This allows you to keep an autodial number from being dialed without erasing the slot and having to re-program it later.

Limiting Call Duration:

The time out timer for the autopatch port limits the total duration of the call. If the timer expires, it will execute the autopatch port's time out macro (see Chapter 8) and hang the autopatch up. If you would like a message to be spoken when this happens, put the commands to speak that message in the time out macro. If you do not want the autopatch to time out, set the timer's duration to 9999 with Command 020. You will probably want to erase the contents of the time out clear macro for the autopatch port with Command 055.

You will be warned before the patch times out. Thirty seconds before timeout, three beeps will be sent out of the radio port and down the phone line (so both sides of the conversation know it). Two beeps are sent twenty seconds before, and one ten seconds before. The CW characters 'S', 'I', and 'E' are used for these warning beeps by default, but you can change them (or eliminate them altogether) using the event triggers (see Chapter 20).

To reset the patch time out timer during a call, use Command 022 to reset timer 199 (see Chapter 4 for more information about timers) by entering "022 199" and unkeying. You could make macro 400 extend the patch timer using the code **3 as follows:

```
053 400 030 18 D or unkey          ; send CW 'I' as a beep-beep response
056 400 038 D or unkey             ; be silent for rest of macro
056 400 022 199 D or unkey         ; reset patch time out timer
010 400 **3 D or unkey             ; rename macro 400 to '**3'
```

How the Dialing Tables Work:

The dialing tables are used to control which long distance numbers can be dialed with Command 112 and which cannot. They do not affect autodial numbers or numbers dialed with Command 113. If you attempt to dial a number with Command 112 that is not allowed you will get an error 212 (you can disable or change this error message by editing macro 212 - see Chapter 8). By default all but 7 digit numbers are blocked (see command 119). Before a number is dialed using Command 112, it must pass the following tests:

All digits in the phone number must be decimal digits. A, B, C, and D are not allowed; if you need to dial these digits, put them in as predial digits, use an autodial slot or use Command 113.

If the number is one, two or three digits and is 500 or less, it will be treated as an autodial number. The autodial number will be looked up, and if it has been programmed, it will be accepted without checking to see if it is long distance or not. It is assumed that whoever programs the autodial slots will decide whether to allow long distance numbers in autodial slots or not.

If the number matches any entry in the allowed number table, it may be allowed (see the rule below); otherwise it is blocked. In other words, if you don't specifically allow that type of number, command 112 won't allow it to be dialed. By default, allowed number slot 000 is programmed to allow all seven digit numbers (it is programmed to "###", which means, "allow any three digits followed by any four digits" - see command 119 for more information).

If a number matches an entry in the allowed number table as described above, it is checked against the nuisance number table. If it matches one of the entries in the nuisance number table, it is blocked (even though the rule above allowed it). For example, the nuisance number table can be used to keep some seven digits numbers from being dialed even though all other seven digit numbers are allowed.

If the number passes all of the above tests and is accepted, it will be read back (if you turn number readback on with Command 110) and then dialed.

Both the allowed numbers table and the nuisance number table store each type of number in a separate "slot". Each slot affects only one length of number, so allowing all seven digit numbers will not affect six or eight digit numbers. You should keep track of what you put in each slot as you program them, so that you can easily change them later.

The allowed numbers table has 500 slots, numbered 000..499. Each slot can hold one type of number that you want to allow. For example, you might want to program slot 0 to allow seven digit numbers that begin with the prefix 245, such as 245-5002 and slot 1 to allow eleven digit numbers that begin with 1800. To do this, you could enter Command 119 000 245 D or unkey (where Command 119 is the name of the command that programs the allowed numbers table, 0 is the slot to store this type of number in, and 245 is the number we want to allow, ignoring the last four digits). If you instead wanted to allow all seven digit numbers, not just 245 numbers, we could enter Command 119 000 ### D or unkey instead. The # symbol is a wildcard digit that represents any decimal digit. To allow 1800 numbers (using slot 1 so we don't mess up the seven digit numbers we allowed in slot 0), we would enter Command 119 001 1800### D or unkey.

The nuisance number table allows you to block numbers that would otherwise be allowed. It has 100 slots, numbered 000..099. You may not need to use the nuisance number table. It is usually used to block prank calls. For example, we allowed all seven digit numbers in the allow table example above. If someone was calling our fax number (245-4889) with the autopatch as a prank, we could block that number by entering Command 121 000 2454889 D or unkey. Note that the nuisance number table is independent from the allowed number table; slot 000 in one table does not interfere with slot 000 in the other table. The nuisance number table requires that you enter all of the digits of the phone number; it does not ignore the last four digits like the allowed number table does. The nuisance number table accepts wildcards. Even if we had allowed all seven digit numbers in the allow table as in the examples above, we could block seven digit numbers beginning with 554 by entering Command 121 001 554#### D or unkey.

You can check the operation of the dialing tables at any time by either trying to dial a number with the forward dial command, or just *pretending* to dial it with Command 123. This command will tell you whether a number would be blocked by the dialing table or would be dialed, without actually using the autopatch. Command 123 will work even if you don't have an autopatch.

Other Commands that Affect the Autopatch:

Command 007 (see Chapter 3) allows you to turn the DTMF mute on or off for the autopatch port. While this does not affect the DTMF digits that are actually generated when the autopatch is dialing, it does have several other effects. See the note on command 007 for more information. During an autopatch call it is possible to connect and disconnect radio ports from the autopatch port, including or excluding them from the remainder of the call. Note that any ports that are included or excluded from the call should also be connected or disconnected from the ports that were already a part of the call, so they can hear both sides of the conversation.

Half-Duplex Links and the Autopatch:

In most cases autopatch calls are placed by users of a repeater. Once a call is connected, the repeater transmitter typically stays keyed continuously for the duration of the call. When no radios are keyed, the

repeater transmits audio from the autopatch (whatever the person on the phone is saying). When a radio is keyed, the repeater "repeats" their audio (and typically mutes the audio from the phone, see command 128 for more info). When the call is terminated, the repeater returns to normal operation and transmits only when someone keys their radio or to send ID, courtesy beeps, hang time, etc.

If the repeater port on the controller is "connected to" (in a group with) *other* ports (repeater or link ports) when a call is placed, those other ports will normally also be connected to the autopatch port. That potentially allows everyone that could communicate using the connected repeaters and links before the call was placed to continue to talk with each other and with the person on the phone during the call. Note that the radios connected to those other ports on the controller (not the end-users' radios) will transmit continuously during the call, just as the repeater does, sending audio from the phone and other connected radios. This works fine for repeaters and full-duplex link radios, but causes problems for half-duplex link radios. Those half-duplex link radios will transmit all of the audio as described above, but because they are continuously transmitting during the call, anyone at the other end of that link will be unable to respond and be heard. This is not a fault of the autopatch, but a side effect caused by the patch receiving audio all of the time and the half-duplex link not being able to receive while transmitting.

The RLC-DSP404 deals with this potential problem by providing a way to automatically disconnect any half-duplex link ports before connecting an autopatch call. The same method could be used, if desired, to disconnect full-duplex links or cross-band repeaters if desired. Before connecting the autopatch port to the port that enters the command to complete the call, it calls the "Before patch off hook" event trigger (???); see Chapter 20 for a list of event triggers. You can use command "157 ??? mmm" to call a macro when that event trigger is fired. The macro can then be programmed to disconnect any ports that you do not want included in the call. This can be done by using command 017 to take them out of the talk group.

Port Connections During A Call:

This section addresses the same subject as the section "Connected Ports" earlier in this chapter but provides more details.

The "Half-Duplex Links and the Autopatch" section above mentions that the controller automatically connects ports to the autopatch. This section provides more details about how that is done by default and how you can customize it. As described in Chapter 2, ports are "connected" by putting them into the same "talk group". Naturally, to "connect" the autopatch port to another port, they should be put into the same group. The question is, "which group?"

If the port that enters the command to complete the autopatch call (typically the repeater port, and referred to as such hereafter) is already in a group, the autopatch port is simply added to that group. It then automatically becomes connected to all of the ports that were previously in that group (unless they are removed by a macro called from the "Before patch off hook" event trigger as described above).

If the repeater port is not already in a group but the autopatch port is in a group (typically by itself), the repeater port will be put into the same group as the autopatch. To ensure that the autopatch port is always in a group, command 110 automatically programs the "Before patch off hook" event to call a macro that puts the autopatch port into **group 3**. That macro can be changed to use a different group if desired; it should generally be a group that is not used for any other purpose (to avoid accidentally connecting ports to the patch during a call). If the macro is changed so it does not put the patch into a group (not recommended) and the repeater port is not in a group, the patch commands may fail and generate error message 313.

110: Configure the Autopatch

This command sets which port the autopatch interface is hooked to and allows you to choose whether and how the number is read back before it is dialed.

<110> pp s

Parameters:
2. 110 is the default command name.
3. pp is the radio port that the autopatch is hooked to (01..12). Enter 00 to specify that no ports are autopatches.
4. s is the readback style, described below. Modes 2 and 3 watch to see if you force the command to be executed by pressing the force-execution digit (defaults to 'D', see command 078) or kerchunk before, during, or shortly after the number is read back; if you do they will immediately quit reading the number back and either dial the number (mode 2) or abort dialing (mode 3). Also see the notes for more options.

S - Readback Style	Reads Number Back	If Kerchunked or Force Execution
0	Never	No Effect
1	Always	No Effect
2	Politely	Makes it Dial
3	Politely	Makes it Abort Dialing
4	Politely	No Effect (dials either way)

Default: The autopatch system is disabled.

Notes:
5. If you change the autopatch port with this command, you will need to set up the reverse patch again with Command 133.
6. You can adjust messages and the duration of the delays before and after the phone number is read back by editing macros 332..338 and 345, after you execute this command to set them up.
7. If this command is executed while the patch is in use, it will hang the patch up.
8. This command automatically turns on timed execution and makes '#' be the force-execution digit for the autopatch port, to make entering commands from the reverse patch easier (see command 133). These changes can be reversed/modified with command 078.
9. This command also sets up an event trigger to put the autopatch port into group 3 when a call is completed - See the section "Port Connections During a Call" above for more info about that.

111: Manual Off Hook

This command connects the port from which the command is executed to the autopatch without dialing any numbers. Touch tones from your radio can be used to dial numbers without DTMF regeneration. This is usually used only for testing, because it doesn't regenerate your DTMF digits, it doesn't allow you to block long distance numbers, and it usually causes an error message when you dial a number. The error message may be generated because the controller can't tell whether you are entering a command (such as to hang up the patch) or dialing a number, so it treats the number as a (usually invalid) command; you can just ignore the error message. Command 114 can be used to hang up the patch.

<111>

Parameters:
  - 111 is the default command name.

112: Normal Forward Dial

This is the normal autopatch up command you would make available to your users if you want an open autopatch. If the number you enter is 3 digits or less, it dials that autodial number. If it is longer, it checks it against the dialing tables described at the beginning of this autopatch section and if it passes, dials that number.. Command 114 can be used to hang up the patch.

<112> sss	Autopatch using an autodial memory slot
<112> d..d	Autopatch using user entered number

Parameters:
  - 112 is the default command name.
  - SSS is the autodial slot number (1..3 digits)
  - D..D is the phone number you want to dial

Notes:
10. The longest number that can be dialed with the command is eleven digits, because that is the longest number that can be specified in the allowed number table. If you need to dial longer numbers, use Command 113.

113: Forward Dial with no Long Distance Checking

This is the autopatch up command you would use if you wanted to dial a number without worrying about whether or not it is allowed by the dialing tables. You would not normally make this command available to the average user, because it would allow them to dial any number, including long distance numbers.

<113> sss	Autopatch using an autodial memory slot
<113> d..d	Autopatch using user entered number

Parameters:
- 113 is the default command name.
- SSS is the autodial slot number (1..3 digits)
- D..D is the phone number you want to dial

Notes:

You can call this from a macro to dial numbers too long to fit in an autodial slot.

Example:
Have macro 600 dial the number 012345678901234567890

<053> 600 113 012345678901234567890 D or unkey or <Enter>

The user will program macro 600 to bring up the patch and dial the number 012345678901234567890.

137: Autodial Only

This is the same as the other dialing commands except it will only let you dial autodial numbers.

<137> sss

Parameters:
- 137 is the default command name.
- SSS is the autodial slot number 0..500 (1..3 digits)

129: Repeat Dial (or recall last number dialed)

This command allows you to easily redial the last number you called or to find out the last number someone else called. You can make it "forget" the last number dialed.

<129>	Redial the last number dialed
<129> pp	Recall (speak, do not dial) the last number dialed from port 'pp'
<129> pp 0	Forget the last number dialed from port 'pp'

Notes:
11. The controller keeps track of the last number dialed separately for each port that can use the autopatch, so if you make a call from port 1 and get a busy signal, then someone on port 2 makes a call (which you might not even know about), then you attempt a redial from port 1, it will redial the number you called, not the number that was called from port 2.
12. This command works for numbers that are dialed directly or using an autodial slot, but it does not remember numbers that are dialed while using command 111 (manual off hook).
13. If you try to use the redial feature after the number has been "forgotten", the controller will speak "Repeat Dial Clear" (it does that by calling an event trigger, see Chapter 20 if you wish to change that message).
14. If you want to allow users to dial the last number dialed but not to use the recall or forget features, make a macro that calls this command and only give users access to that macro. For example:
    010 600 ABC ;   name macro "ABC"
    053 600 129 ;   program macro to execute command 129

114: Hang up the Autopatch

This is the command to use to hang up the autopatch, no matter which of the three autopatch up commands you used to take it off-hook.

<div align="center">

<114>

</div>

Parameters:
   - 114 is the default command name.

Note:
    The autopatch is also hung up whenever the controller is reset.

Example:
   I want my autopatch hang-up code to be '#'

<div align="center">

<010> 114 # D or unkey or <Enter>

</div>

Now the users will enter '#' to hang-up the autopatch.

115: Possibly Hang up the Autopatch

This command normally works exactly like command 114, but it won't allow you to hang up the patch if someone else on another radio port is using it and you aren't. Command 114 will hang up the patch if it is in use by any port; that is you can hang it up even if someone else on another port of the controller that is using it. It is important to be able to do that if there is an emergency and you need to cut them off. On the other hand, if someone tries to use the patch and gets the "autopatch busy" message, they may not realize (or care) that someone else is using the patch even though they can't hear it, and they may hang it up. Giving the users access to command 115 rather than 114 will solve that problem, as only the port(s) that can hear the autopatch call will be allowed to hang it up. If they try to hang it up with this command while someone else is using it, you may want to speak a message that indicates that they aren't allowed to do that. Event trigger 202 "Hang Up Command 115 Blocked" (see Chapter 20) will let you do that.

<div align="center">

<115>

</div>

116: Set / Recall the Predial Digits and Timing

When either of the forward dial commands are used, several things must take place before the number is actually dialed:

- If number readback is turned on, speak the number.
- Take the phone line off-hook. This is the same as you picking up your phone at home.
- Since the controller can not listen to see if it gets dial tone from the phone line, it just delays for a little bit and assumes that dial tone is there. We will call this delay the "initial delay".
- If you must dial '9' or some other digits to get out of a local switchboard or PBX, those digits should be dialed here. We will call those "predial digits". You can also use these predial digits to dial special codes to turn on or off call waiting, caller ID, and other special features that your phone company may offer. They can be omitted if you are not on a PBX.
- After dialing the predial digits, you may need to delay again while the PBX hooks you up to an outside telephone line. We will call this delay the "after-predial delay". This delay can be set to zero if you are not using predial digits.
- Now we can dial the actual number.

This command lets you set the initial delay, predial digits (if any), and after-predial delay.

Recall Settings	<116> 0
Change Settings	<116> iii aaa d..d

Parameters:
116 is the default command name.
III is the duration of the initial delay in 10mS increments (001..250). Default is 100. Do not set to 0.
AAA the duration of the after-predial delay in 10mS increments (001..250). Default is 100. Do not set to 0.
D..D are the predial digits. They can be omitted. The maximum number of predial digits is 10. Any of the 16 DTMF digits can be used, although you might have to temporarily change your force-execution digit to use it (see command 078).

Defaults:
Initial delay = 100 (1 second)
After-predial delay = 100 (1 second)
Predial digits = none

Note:
Do not use a delay time of 0, or will lock the TX on the air sending the dialing cover tone until the controller is reset.

119: Set Allowed Numbers Table Slot

This command allows you to set one of the slots in the allowed numbers table. For a description of this table and how to use it, see the explanation of the dialing tables before Command 110.

<119> sss	Clear slot sss
<119> sss d..d	Program slot sss

Parameters:
- 119 is the default command name.
- SSS is the slot number (000..499)
- D..D is the area code/prefix (do not include the last four digits of the phone number). The '#' digit is a wildcard that matches any digit.

Defaults:
- Slot 000 is programmed to "###", which allows all seven digit numbers.

Example:

<119> 001 1800 ### D or unkey or <Enter>

- This will allow all 1-800 numbers

120: Recall Allowed Numbers Table Slot

This command allows you to recall the contents of one of the slots in the allowed numbers table. For a description of this table and how to use it, see the explanation of the dialing tables before Command 110.

<120> sss

Parameters:
- 120 is the default command name.
- SSS is the slot number (000..499)

121: Set Nuisance Numbers Table Slot

This command allows you to set one of the slots in the nuisance number table. For a description of this table and how to use it, see the explanation of the dialing tables before Command 110.

<121> sss	Clear slot sss
<121> sss d..d	Program Slot sss

Parameters:
- 121 is the default command name.
- SSS is the slot number (000..099)
- D..D is the whole number to be blocked (do include the last four digits of the phone number). The '#' digit is a wildcard that matches any digit.

Defaults:
- No slots are programmed, so any numbers allowed by command 119 can be dialed with command 112.

Example:
- "121 000 245 5002" will program slot 000 to block 245-5002 even though it is allowed by default (along with all other seven digit numbers) by command 119.

122: Recall Nuisance Numbers Table Slot

This command allows you to recall the contents of one of the slots in the nuisance number table. For a description of this table and how to use it, see the explanation of the dialing tables before Command 110.

<122> sss

Parameters:
- 122 is the default command name.
- SSS is the slot number (000..099)
- D..D is the whole number to be blocked (do include the last four digits of the phone number). The '#' digit is a wildcard that matches any digit.

123: Test Dialing Tables

This command allows you to test the dialing tables. It takes the telephone number you enter and tests it in the exact same way the normal forward dial Command 112 does, but instead of dialing the number, it just tells you whether or not the number is rejected by the dialing tables. This comes in very handy when setting up the dialing tables, because you don't have to actually dial and hang up numbers to see if they are blocked or not. This command also works from the serial port, allowing you to check the dialing table from a terminal or computer. You do not have to have an autopatch installed to use this command.

<123> d..d

Parameters:
- 123 is the default command name.
- D..D is the number you wish to test with the dialing tables

124: Set Autodial Slot

This command allows you to set one of the autodial slots. For a description of the autodial slots and how to use them, see the autopatch section before Command 110.

<124> sss d..d

Parameters:
- 124 is the default command name.
- SSS is the slot number (0..500)
- D..D is the whole number to be dialed (up to 18 digits), not including any predial digits (they must be set with Command 116 - you can keep them from being sent for an autodial slot with Command 126).

Notes:
15. You can clear the data out of a slot by entering Command 124 SSS D or unkey
16. You can disable a slot without erasing it with Command 127.
17. After you program an autodial memory, the predial information for that slot is enabled
18. Autodial numbers are not checked by the long distance dialing tables

125: Recall Autodial Slot

This command allows you to recall the contents of one of the autodial slots.

<125> sss

Parameters:
- 125 is the default command name.
- SSS is the slot number (0..500)

126: Send Predial Digits / Callsign for Autodial Slot?

This command allows you to control whether or not the predial digits will be sent before an autodial number. The default is to send them. By telling the controller not to send them, you can dial extensions on the PBX you are on (numbers that don't need the predial digits) with an autodial slot. The initial delay and after-predial delay (see Command 116) are sent in either case.

It also allows you to control whether or not any call signs you may have programmed for your users will be spoken when dialing their autodial slot. You may also want to assign autodial slots for emergency numbers and program their "callsign" to be something like "police". See command 191 for information about programming call signs.

Set Predial Sending	<126> sss p
Set Callsign Sending	<126> sss p c

Parameters:
> 126 is the default command name.
> SSS is the slot number (0..500)
> 'p' is 1 to send the predial digits (the default), 0 to not send them.
> 'c' (optional, no change if omitted) is 1 to send the callsign for that autodial slot if it is programmed (the default), 0 is to just use the number of the autodial slot. The default call signs are the number of the slot, spoken as separate digits like "two three zero". If you set 'c' to 0, it will speak the number of the slot as a number, like "two hundred thirty".

Notes:
> This command must be executed after you program an autodial position. The default setting for this command is predial enabled. If you have a predial number programmed, and you do not want the controller to add a predial your autodial slot number, then you must execute this command and disable the predial setting for that specific autodial number.

127: Enable/Disable an Autodial Slot

This command allows you to disable an autodial slot without erasing its contents so you can enable it later without having to re-enter the number.

<127> sss c

Parameters:
> - 127 is the default command name.
> - SSS is the slot number (0..500)
> - C is 1 to enable the slot (also done automatically when you program it), 0 to disable it

128: Set/Recall Patch Audio Options for a TX

Talking to someone using the autopatch is different in several ways from talking to someone on a repeater. One difference is that when you are talking on a repeater, everyone has to wait until you unkey before they can talk (unless they have a stronger signal than you do and can capture the repeater receiver); a person talking on a phone during an autopatch call can talk at the same time that you are talking on the radio. If you are using a typical transceiver (HT or mobile) that is half-duplex (cannot transmit and receive at the same time), you can't talk and listen at the same time. If the autopatch is set up to work full-duplex and the person on the phone talks at the same time you do, you will not be able to hear what they are saying, but anyone else listening to the repeater will be able to hear both you and them. To avoid this problem, the autopatch can be set to work in half-duplex mode. Half-duplex mode causes the audio from the phone to be muted whenever you are talking; if someone starts to say something that shouldn't be transmitted, all you have to do is key up and they will get muted. This is the default mode. In some situations, such as when you have two radios (one to talk on and the other to listen with) or a radio that can transmit and receive at the same time (possibly on different bands), you may want to change the autopatch to work in duplex mode. You can change the mode in the middle of a call, and can select the mode for each transmitter separately.

Another difference between talking to someone on a repeater versus an autopatch is that the person using the phone through the autopatch doesn't care if your audio gets transmitted out the repeater or not; he is listening to the phone. If you don't want everyone else that is monitoring the repeater to hear the things you say while you are talking on the autopatch, you can tell the controller to mute your audio at those times. That is known as "semi-private" mode. Anyone that is listening to the repeater while you use the autopatch in semi-private mode will only hear one side of the conversation, what the person on the phone says. You can turn on a cover tone to be sent while the person on the radio is talking, or just let it be silent.

<128> pp	Recall half-duplex and semi-private settings for a port
<128> pp h	Set autopatch half-duplex mode for a port
<128> pp h s <128> pp 0 0 <128> pp 1 0 <128> pp 1 1 <128> pp 1 2	Set autopatch half-duplex and semi-private modes for a port Full duplex mode, not semi-private Half duplex, not semi-private Half duplex, semi-private with no cover tone Half duplex, semi-private with cover tone

Parameters:
- 128 is the default command name.
- pp is the port (01..12) that the autopatch call is made or answered from, not the autopatch port (3).
- H is the Half-Duplex on/off setting, 1 for half duplex (the default), 0 for full duplex

Notes:
The half/full duplex mode and semi-private mode settings are independent, but the semi-private feature doesn't work well in duplex mode because the autopatch hybrid is not (and can not be) perfect. For this reason, only the combinations shown in the chart above are useful in most situations.

This command allows you to control whether the audio from the autopatch gets muted when one of the receivers that can send audio to the patch is active. When the controller receives a

command to bring up the patch, it connects that port and any ports that are monitoring or connected to that port to the patch, so they can all take part in the call. Each of those ports' transmitters will stay up for the duration of the call. Each transmitter that is set for full-duplex mode with this command will transmit the audio from the autopatch for the entire duration of the call; if it also transmits the audio from a receiver, it will mix it with the autopatch audio. Each transmitter that is set up for half-duplex mode (the default) with this command will mute the audio from the autopatch whenever someone keys up their radio to talk to the person on the phone. This allows the control op to mute anything that the person on the phone may say by simply keying up, rather than having to hang up the patch.

133: Set up Reverse Patch

This command allows you to set up the reverse autopatch. You must set up the forward patch functions with Command 110 before you use this command. If you want to change how the reverse patch works, just execute this command again with the new information.

<133>	Recall reverse patch settings
<133> 0	Disable reverse autopatch
<133> 1 xx pp.. qq	Configure for over-air ringing
<133> 2 xx	Configure for control mode with no password
<133> 2 xx n..n	Configure for control mode with password n..n

Parameters:
- 133 is the default command name.
- There are three reverse patch "modes".

  Mode 0 disables the reverse patch. Forward patch will still work normally.

  Mode 1 is the ring over air mode

  XX - Number of rings the controller waits before ringing over the air.
  pp..qq - What ports the ringing will be routed to

  Mode 2 is the control mode

  XX - Number of rings the controller waits before answering the phone.
  N..N - Access code required when in mode 2 access

Note about Ring Detection:
This command automatically enables the keyup delay filter (see the description for the keyup delay timers in Chapter 4 for more information) for the autopatch port (port 4). This helps prevent transients on the phone line from fooling the controller into thinking the phone is ringing when it is not. If the phone line going to the controller rings in very short bursts, you may have to disable or shorten the keyup delay timer after executing this command to get the controller to answer.

Note on Mode 2:
After XX rings, the controller will answer the phone and give you about 29 seconds to enter the access code N..N, or it will hang up on you. If you enter the code N..N correctly the controller will speak "Control" and let you enter commands by DTMF just as you would from a radio port. Since you can't unkey to tell the controller to execute the commands, you will have to either use timed execution or change your force-execution digit for the autopatch from 'D' to '#' (both of those things are done automatically by command 110, see command 078 for more details). Note that you will have to have to rename any commands you wish to execute from the telephone to not contain the digits 'A', 'B', 'C' or 'D', as those digits can't be entered from most telephones.

After entering the access code, you can go out over radio ports or just monitor them by executing Commands 000 and 001. For example, if your autopatch is on port 12 and you wish to monitor the repeater on port 1, execute Command 001 121 D or wait if in timed execution mode. This will make the autopatch (port 12) monitor the repeater (port 1).

134: Access Reverse Patch Control Mode

You do not need to know about this command - it is for the controller's internal use when using reverse patch mode 2 (control mode), so you can quit reading now if you want. When the controller answers the phone in mode 2, the only commands you can execute are the pre-access macros for the autopatch port, because the controller turns preaccess on when you set up the patch. When you specify the reverse patch access code with Command 133, it renames one of the pre-access macros for that port to the access code and programs that macro to call this command when executed. This command allows you to access all of the commands until the patch is hung up, resets the patch time out timer, and stops the pre-access timer, among other things. If you are accessing the reverse patch in mode 2 and the time out timer is about to expire, you can execute this command to keep the patch from timing out.

<134>

Parameters:
> - 134 is the default command name.

135: Answer Reverse Patch

This command is used to answer a reverse patch call that is ringing out over the air (Autopatch needs to be configured as mode 1 with command 133 or mode 2 if command 132 is also used). It will only work when the reverse patch is ringing - it is not a substitute for the manual off-hook command. The patch is hung up the same way as for forward patch, with Command 114.

<135>

Parameters:
> - 135 is the default command name.

Notes:
> The controller will speak "Connect" out both the radio and the autopatch when this command is executed successfully.
> If you try to execute this command and the reverse autopatch has not been ringing, you will get an autopatch error (See System wide errors at the front of the manual)

132: Start Reverse Patch Call-Out

There are several different ways to use the reverse autopatch. Command 133 allows you to select what the controller should do when it detects that the phone line is ringing (when someone is calling the controller). It can ignore the ringing (mode 0), generate a ring tone over the air without answering the phone (mode 1), or answer the phone after a few rings (mode 2). This command is only useful when command 133 is set for mode 2.

After the controller answers the phone, it may require you to enter a password (see command 133 for details). After the password has been entered, it will say "control", unless you have changed that message to something else. At that point, the controller will wait for you to enter a command. You could enter any command, such as 026 to recall the time or 187 to log on so you can do password-protected commands. By using this command, you can make the controller do a general call-out or directed call-out.

<132>	Start general call-out
<132> x <132> xx <132> xxx	Start directed call-out to user xxx

If you start a general call-out, the controller will generate a ring-tone over the air. Anyone listening can answer the call-out by entering the reverse patch answer command (135, or whatever you have renamed it to). If no one answers the call-out, the controller will generate the ring tone a certain number of times, then give up and say "No answer" to the person on the phone. The number of times it will ring before giving up can be changed with command 136; it defaults to 5 rings for a general call-out. The ring tone will normally be transmitted on port 1, but that can be changed with command 192.

If you start a directed call-out and someone is talking on one of the ports that the call-out is going to, the controller will generate a ring tone until they unkey. Then it will speak their callsign, "Call for" and their callsign again, send the ring tone three times, and speak "<callsign> call for <callsign>" again. Finally, it will ring a few more times, then give up and tell the person on the phone "No answer". The call-out can be answered at any time with command 135 or stopped with the hang up command (114 or 115). The callsign for each user can be set with command 191. Normally the call-out will be done on the transmitter connected to port 1, but that can be changed (or directed call-out can be disabled) for each user with command 192. Command 192 can also be used to change how many times the controller will generate the ring tone before giving up (the default is three). The person listening to the phone will hear a DTMF '1' rather than a standard telephone ring tone.

If you wish to stop either a general or directed call-out before anyone answers it, enter the hang up code (the name of command 114 or 115). This will stop the call-out but will not cause the controller to hang up. You can then execute command 132 to try again, or any other command. If you wish to hang up, enter the hang up code again.

136: Set up Reverse Autopatch Ring

This command allows the user to set up the over the air ringing tone and duration.

<136>	Recall ring duration and frequencies
<136> gg dd	Set number of rings before give up when using command 132
<136> xxx yyyy zzzz	Set ring duration and frequencies

Parameters:
- 136 is the default command name.
- GG is the maximum number of times the controller will generate a ring tone when command 132 is used to do a general call-out. Default is 5 rings.
- DD is the maximum number of times the controller will generate a ring tone at the end of the directed reverse patch call-out sequence. See command 132 for more details. The default is 3 rings.
- XXX is the duration of the ring tone
- YYYY is the Frequency of the first ring tone
- ZZZZ (optional) is the Frequency of the second ring tone

Defaults:
Ring tone duration defaults to 2 Second
Ring tone frequencies default to 0440 Hz and 0480 Hz.

Example:
To set the ring back to the default: 136 200 0440 0480

Notes:
You should not make the duration of the ring tone too long. The controller will stack up tone requests and could still be ringing over the air after the phone has answered if the duration of the tone is longer than the delay between rings from your phone company.
When using command 132 for either a general or directed call-out, the person on the phone will hear a DTMF '1' rather than the tone frequencies specified with this command (that the person listening to the radio will hear). That is because the RLC-DSP404 does not have the hardware needed to send a normal ring tone to the autopatch.

192: Set/Recall Call-Out Options

The command allows you to set and recall several options that affect how the reverse patch call-out command (132) works. The default is to allow the general call-out and directed call-out for all users. If you disable the directed call-out for a user and someone attempts to do a directed call-out to them using command 132, they will hear the message "No P A G E R". Each user's callsign can be set with command 191 (in Chapter 18).

<192> 0 000	Recall general call-out settings
<192> 0 000 0	Disable general call-out
<192> 0 000 1 x..x	Enable general call-out to transmitters x..x

<192> 0 uuu	Recall directed call-out settings for user uuu
<192> 0 uuu 0	Disable directed call-out to user uuu
<192> 0 uuu 1 x..x	Enable directed call-out to user uuu on transmitters x..x

<192> 1 uuu vvv	Recall settings for range of users from uuu to vvv
<192> 1 uuu vvv 0	Disable directed call-out for users uuu..vvv
<192> 1 uuu vvv 1 x..x	Enable directed call-out for users uuu..vvv on transmitters x..x

Parameters:
- uuu is the user number
- vvv is the last user number in a range from user uuu to user vvv
- x..x is a list of the ports that the call-out will be transmitted on. The default for everything is transmitter 1.