

```
/*
 * Asterisk -- An open source telephony toolkit.
 *
 * Copyright (C) 2002-2014, Jim Dixon, WB6NIL
 *
 * Jim Dixon, WB6NIL <jim@lambdatel.com>
 * Serious contributions by Steve RoDgers, WA6ZFT <hwstar@rodgers.sdcoxmail.com>
 *
 * See http://www.asterisk.org for more information about
 * the Asterisk project. Please do not directly contact
 * any of the maintainers of this project for assistance;
 * the project provides a web site, mailing lists and IRC
 * channels for your use.
 *
 * This program is free software, distributed under the terms of
 * the GNU General Public License Version 2. See the LICENSE file
 * at the top of the source tree.
 */
/#! \file
 *
 * \brief Radio Repeater / Remote Base program
 * version 0.323 06/07/2014
 *
 * \author Jim Dixon, WB6NIL <jim@lambdatel.com>
 *
 * \note Serious contributions by Steve RoDgers, WA6ZFT <hwstar@rodgers.sdcoxmail.com>
 * \note Steven Henke, W9SH, <w9sh@arrl.net> added a few features here and there.
 *
 * See http://www.zapatatelephony.org/app\_rpt.html
 *
 *
 * Repeater / Remote Functions:
 * "Simple" Mode: * - autopatch access, # - autopatch hangup
 * Normal mode:
 * See the function list in rpt.conf (autopatchup, autopatchdn)
 * autopatchup can optionally take comma delimited setting=value pairs:
 *
 *
 * context=string      : Override default context with "string"
 * dialtime=ms         : Specify the max number of milliseconds between phone
number digits (1000 milliseconds = 1 second)
 * farenddisconnect=1  : Automatically disconnect when called party hangs up
 * noct=1              : Don't send repeater courtesy tone during autopatch calls
 * quiet=1             : Don't send dial tone, or connect messages. Do not send patch
down message when called party hangs up
 *
```

*
* Example: 123=autopatchup,dialtime=20000,noct=1,farenddisconnect=1
*
* To send an asterisk (*) while dialing or talking on phone,
* use the autopatch access code.
*
*
* status cmds:
*
* 1 - Force ID (global)
* 2 - Give Time of Day (global)
* 3 - Give software Version (global)
* 4 - Give GPS location info
* 5 - Last (dtmf) user
* 11 - Force ID (local only)
* 12 - Give Time of Day (local only)
*
* cop (control operator) cmds:
*
* 1 - System warm boot
* 2 - System enable
* 3 - System disable
* 4 - Test Tone On/Off
* 5 - Dump System Variables on Console (debug)
* 6 - PTT (phone mode only)
* 7 - Time out timer enable
* 8 - Time out timer disable
* 9 - Autopatch enable
* 10 - Autopatch disable
* 11 - Link enable
* 12 - Link disable
* 13 - Query System State
* 14 - Change System State
* 15 - Scheduler Enable
* 16 - Scheduler Disable
* 17 - User functions (time, id, etc) enable
* 18 - User functions (time, id, etc) disable
* 19 - Select alternate hang timer
* 20 - Select standard hang timer
* 21 - Enable Parrot Mode
* 22 - Disable Parrot Mode
* 23 - Birdbath (Current Parrot Cleanup/Flush)
* 24 - Flush all telemetry
* 25 - Query last node un-keyed
* 26 - Query all nodes keyed/unkeyed
* 27 - Reset DAQ minimum on a pin
* 28 - Reset DAQ maximum on a pin

```

* 30 - Recall Memory Setting in Attached Xcvr
* 31 - Channel Selector for Parallel Programmed Xcvr
* 32 - Touchtone pad test: command + Digit string + # to playback all digits pressed
* 33 - Local Telemetry Output Enable
* 34 - Local Telemetry Output Disable
* 35 - Local Telemetry Output on Demand
* 36 - Foreign Link Local Output Path Enable
* 37 - Foreign Link Local Output Path Disable
* 38 - Foreign Link Local Output Path Follows Local Telemetry
* 39 - Foreign Link Local Output Path on Demand
* 42 - Echolink announce node # only
* 43 - Echolink announce node Callsign only
* 44 - Echolink announce node # & Callsign
* 45 - Link Activity timer enable
* 46 - Link Activity timer disable
* 47 - Reset "Link Config Changed" Flag
* 48 - Send Page Tone (Tone specs separated by parenthesis)
* 49 - Disable incoming connections (control state noice)
* 50 - Enable incoming connections (control state noicd)
* 51 - Enable sleep mode
* 52 - Disable sleep mode
* 53 - Wake up from sleep
* 54 - Go to sleep
* 55 - Parrot Once if parrot mode is disabled
* 56 - Rx CTCSS Enable
* 57 - Rx CTCSS Disable
* 58 - Tx CTCSS On Input only Enable
* 59 - Tx CTCSS On Input only Disable
* 60 - Send MDC-1200 Burst (cop,60,type,UnitID[,DestID,SubCode])
*     Type is 'I' for PttID, 'E' for Emergency, and 'C' for Call
*     (SelCall or Alert), or 'SX' for STS (ststus), where X is 0-F.
*     DestID and subcode are only specified for the 'C' type message.
*     UnitID is the local systems UnitID. DestID is the MDC1200 ID of
*     the radio being called, and the subcodes are as follows:
*         Subcode '8205' is Voice Selective Call for Spectra ('Call')
*         Subcode '8015' is Voice Selective Call for Maxtrac ('SC') or
*         Astro-Saber('Call')
*         Subcode '810D' is Call Alert (like Maxtrac 'CA')
* 61 - Send Message to USB to control GPIO pins (cop,61,GPI01=0[,GPI04=1].....)
* 62 - Send Message to USB to control GPIO pins, quietly
(cop,62,GPI01=0[,GPI04=1].....)
* 63 - Send pre-configured APRSTT notification (cop,63,CALL[,OVERLAYCHR])
* 64 - Send pre-configured APRSTT notification, quietly (cop,64,CALL[,OVERLAYCHR])
* 65 - Send POCSAG page (equipped channel types only)
*
* ilink cmds:
*

```

- * 1 - Disconnect specified link
- * 2 - Connect specified link -- monitor only
- * 3 - Connect specified link -- tranceive
- * 4 - Enter command mode on specified link
- * 5 - System status
- * 6 - Disconnect all links
- * 7 - Last Node to Key Up
- * 8 - Connect specified link -- local monitor only
- * 9 - Send Text Message (9,<destnodeno or 0 (for all)>,Message Text, etc.
- * 10 - Disconnect all RANGER links (except permalinks)
- * 11 - Disconnect a previously permanently connected link
- * 12 - Permanently connect specified link -- monitor only
- * 13 - Permanently connect specified link -- tranceive
- * 15 - Full system status (all nodes)
- * 16 - Reconnect links disconnected with "disconnect all links"
- * 17 - MDC test (for diag purposes)
- * 18 - Permanently Connect specified link -- local monitor only

- * 200 thru 215 - (Send DTMF 0-9,*,#,A-D) (200=0, 201=1, 210=*, etc)
- *
- * remote cmds:
- *
- * 1 - Recall Memory MM (*000-*099) (Gets memory from rpt.conf)
- * 2 - Set VF0 MMMMM*KKK*0 (Mhz digits, Khz digits, Offset)
- * 3 - Set Rx PL Tone HHH*D*
- * 4 - Set Tx PL Tone HHH*D* (Not currently implemented with DHE RBI-1)
- * 5 - Link Status (long)
- * 6 - Set operating mode M (FM, USB, LSB, AM, etc)
- * 100 - RX PL off (Default)
- * 101 - RX PL On
- * 102 - TX PL Off (Default)
- * 103 - TX PL On
- * 104 - Low Power
- * 105 - Med Power
- * 106 - Hi Power
- * 107 - Bump Down 20 Hz
- * 108 - Bump Down 100 Hz
- * 109 - Bump Down 500 Hz
- * 110 - Bump Up 20 Hz
- * 111 - Bump Up 100 Hz
- * 112 - Bump Up 500 Hz
- * 113 - Scan Down Slow
- * 114 - Scan Down Medium
- * 115 - Scan Down Fast
- * 116 - Scan Up Slow
- * 117 - Scan Up Medium
- * 118 - Scan Up Fast

* 119 - Transmit allowing auto-tune
* 140 - Link Status (brief)
* 200 thru 215 - (Send DTMF 0-9,*,#,A-D) (200=0, 201=1, 210=*, etc)
*
* playback cmds:
* specify the name of the file to be played globally (for example, 25=rpt/foo)
*
* localplay cmds:
* specify the name of the file to be played locally (for example, 25=rpt/foo)
*
* 'duplex' modes: (defaults to duplex=2)
*
* 0 - Only remote links key Tx and no main repeat audio.
* 1 - Everything other than main Rx keys Tx, no main repeat audio.
* 2 - Normal mode
* 3 - Normal except no main repeat audio.
* 4 - Normal except no main repeat audio during autopatch only
*
*
* "events" subsystem:
*
* in the "events" section of the rpt.conf file (if any), the user may
* specify actions to take place when certain events occur.
*
* It is implemented as scripting, based heavily upon expression evaluation built
* into Asterisk. Each line of the section contains an action, a type, and variable
info.
* Each line either sets a variable, or executes an action based on a transitional
state
* of a specified (already defined) variable (such as going true, going false, no
change,
* or getting set initially).
*
* The syntax for each line is as follows:
*
* action-spec = action|type|var-spec
*
* if action is 'V' (for "setting variable"), then action-spec is the variable being
set.
* if action is 'G' (for "setting global variable"), then action-spec is the global
variable being set.
* if action is 'F' (for "function"), then action-spec is a DTMF function to be
executed (if result is 1).
* if action is 'C' (for "rpt command"), then action-spec is a raw rpt command to be
executed (if result is 1).
* if action is 'S' (for "shell command"), then action-spec is a shell command to be
executed (if result is 1).

```
*
* if type is 'E' (for "evaluate statement" (or perhaps "equals") ) then the var-spec
is a full statement containing
*   expressions, variables and operators per the expression evaluation built into
Asterisk.
* if type is 'T' (for "going True"), var-spec is a single (already-defined) variable
name, and the result will be 1
*   if the variable has just gone from 0 to 1.
* if type is 'F' (for "going False"), var-spec is a single (already-defined) variable
name, and the result will be 1
*   if the variable has just gone from 1 to 0.
* if type is 'N' (for "no change"), var-spec is a single (already-defined) variable
name, and the result will be 1
*   if the variable has not changed.
*
* "RANGER" mode configuration:
* in the node stanza in rpt.conf ONLY the following need be specified for a RANGER
node:
*
*
*
* [90101]
*
* rxchannel=Radio/usb90101
* functions=rangerfunctions
* litzcmd=*32008
*
* This example given would be for node "90101" (note ALL RANGER nodes MUST begin with
'9'.
* litzcmd specifies the function that LiTZ initiates to cause a connection
* "rangerfunctions" in this example, is a function stanza that AT LEAST has the *3
command
* to connect to another node
*
*
*/
```