INTRODUCTION---rtpDir/rtpDir_tm: A dstar-IRLP-Echolink-asterisk bridge application.
==========
   rtpDir/rtpDir_tm bridge, is a VoIP software that can run
on any station, repeater or link.
It is mostly used for the Amateur radio service,
but a user can also use it to create a private VoIP net.
The current version 1.60 also runs
as a BRIDGE conference server with a graphical interface(rtpDir)
or without graphical interface(rtpDir_tm).
rtpDir works on Linux(no emulation) and Windows and has the same
screen interface on both platforms.
rtpDir_tm works on Linux systems that have no desktop(X11,KDE,GNOME)
installed and it is useful for Linux users that do not need or want
to install a GUI on top of their Linux box.
This software is provided 'as-is', without any express or implied
warranty. In no event will the authors be held liable for any damages
arising from the use of this software.
This software is provided as-is and the authors are not responsible
for any anything.

Configuration choices
==========
rtpDir (or rtpDir_tm) runs as:

   --- dstar + Echolink + IRLP reflector + asterisk
           Multiple connections are allowed.
           No need to install any IRLP software.
           No need to install any echolink software.
           No need to install any dstar software,

except dextra_client
Install asterisk on your system(Linux only) or have a remote asterisk node connect to your station.

--- dstar + Echolink + IRLP stnXXXX node + asterisk
Do not allow more than one connection if an IRLP node is connected to your station.
If you enable the IRLP part, you need the IRLP node software.
No need to install any echolink software.
No need to install any dstar software, except dextra_client
Install asterisk on your system(Linux only) or have a remote asterisk node connect to your station.

In either of the above two configuration options, you can enable or disable
a specific part(IRLP, dstar, echolink, asterisk)

It supports all the IRLP codecs: ADPCM, u-Law, GSM.

rtpDir or rtpDir_tm as an IRLP expXXXX reflector:
Send an e-mail to experimental@irlp.net and ask for an IRLP expXXXX number to
be assigned to you. The IRLP network will assign expXXXX to your IRLP reflector.

rtpDir_tm as an IRLP refXXXX reflector. These are the old IRLP refXXXX reflectors.
These old IRLP refXXXX reflector numbers are not given out any more.
If you were lucky and you already had a refXXXX number assigned to you,
or you are already running an IRLP refXXXX, then rtpDir_tm can run that too.

It supports all Echolink modes: repeater, link, PC user, conference.
It supports IRLP links, repeaters.
It supports asterisk connections thru the use of the chan_rtpdir.c channel driver.

It supports dstar connections thru the use of the dextra_client package.
For hams that use asterisk only, the asterisk channel driver chan_dstar.c for dstar connections is used.

Finally you may set up rtpDir(or rtpDir_tm) to bridge dstar, IRLP, Echolink, asterisk.

You may use rtpDir or rtpDir_tm or dstar_hot_point with dextra_client to connect to dstar/dextra_srv nodes or dstar XRF reflectors.

WARNING:Starting with release v1.21:
==========
For an IRLP node running the old text mode EchoIRLP which is
IRLP + tbd + EchoIRLP scripts, you will
have to remove tbd.
The steps to do that,
in the Files section, in the file remove_tbd.txt
When you finish doing that, then follow the steps under the section
"Additional steps if you plan to run rtpDir/ rtpDir_tm in Echolink + IRLP mode",
listed below in this document.
The reason behind the discontinued support for tbd is
because our group has no control of the changes
in that software and we can not guarantee any more
that it will work with future versions of the rtpDir bridge
as the design approach of rtpDir/rtpDir_tm is very different from tbd.

WARNING: Automatic/nightly updates with yum
==========
For people that are running Linux systems, it is strongly suggested
that you disable the automatic/nightly updates with yum or yum-updatesd or at any

time during the day. The reason is that the automatic software updates
may render your Linux system unuseable or in the worst case scenario
un-bootable.

So, disable all the automatic software updates that yum or yum-updatesd
is doing overnight by disabling the updates.

Note: You may have yum or yum-updatesd or both on a Linux system running in the background).

```
service yum stop
chkconfig yum off

service yum-updatesd stop
chkconfig yum-updatesd off
```

Then only after you install your software like IRLP, rtpDir, ...
add the following line to /etc/yum.conf at the end of the file:

```
exclude=kernel*
```

This says, that just in case you are trying to download something manually
(or due to nightly updates because of yum or yum-updatesd running in the background)
you will not let that change your Linux kernel.

It is very important that you do that, especially if you intend to run
Asterisk or IRLP on that Linux box.
You can always install or update software on your Linux box by
executing the yum command manually like this:

```
yum install someNEWsoftwareHERE
```

CONFERENCE CALLSIGNS
====================
   To request a new CONFERENCE callsign, example:
MYCONF,
   enter your new CONFERENCE callsign, example *MYCONF*
as
   the call in the 5198.conf configuration file or
5198_tm.conf
   The configuration file for rtpDir is 5198.conf,
   the configuration file for rtpDir_tm is 5198_tm.conf

   Example:
   If you want to create a new CONFERENCE callsign,
example: *MYCONF*
   set this:

   call=*MYCONF*

   Then start rtpDir(or rtpDir_tm) bridge. At this
point, rtpDir/rtpDir_tm
   bridge will go into a loop and you will have to
verify/validate the
   new CONFERENCE callsign at http://www.echolink.org/
validation/
   Check to see if a "firewall" issue is preventing the
   rtpDir/rtpDir_tm bridge from contacting the Echolink
servers.

   Also, be sure you are NOT using an EchoLink Proxy to
connect;
   You cannot register a new callsign through a Proxy
connection.

   After validation has been completed, stop and re-
start the rtpDir/rtpDir_tm bridge.
   You can not run both, rtpDir and rtpDir_tm unless
you change
   ports in the config file, since rtpDir and rtpDir_tm
do mostly the same thing
   and open/bind the same ports.

Credits:
=======
  Thanks to VA3TO for supplying us with the specs to the
VA3TO link interface. It is the interface that we recommend, it has a DTMF decoder on-board, timeouts, access to COS and works in "ASCII" or "SOUND" mode, although other link interfaces will also work.

A few notes about IRLP crosslinking:
====================================
Starting with release v1.56, the configuration variable accessIRLP dictates
whether you are allowed to do crosslinking between IRLP nodes and non-IRLP nodes.
It also dictates wether you are running rtpDir in "IRLP stnXXXX node" or "IRLP reflector mode".

When accessIRLP=yes

Outbound calls to IRLP nodes are allowed. You are running in IRLP stnXXXX node mode.
Crosslinking is NOT allowed between IRLP and non-IRLP nodes.(dstar, echolink, asterisk).
If an IRLP node is connected to your station, do not allow other stations to come in.
If there is no IRLP node connected to your station, then you are free
to have multiple stations connected to your station.

So, to bring in an IRLP node, disconnect all stations first, disable the non-IRLP part
with the dtmfDisable command, enable the IRLP part with dtmfIRLPon
and then connect to an IRLP node.
The system will be busy and no Echolink, Asterisk, dstar node will come in
except an IRLP node.
To bring in Echolink, Asterisk, dstar nodes,

disconnect all stations first, enable the non-IRLP part with dtmfEnable command,
then disable the IRLP part with dtmfIRLPoff command and then connect to non-IRLP nodes.

When accessIRLP=no

Outbound calls to IRLP nodes are NOT allowed. You are running in IRLP reflector mode.
Crosslinking is allowed between all VoIP networks. (IRLP, dstar, echolink, asterisk).
Any type of station can connect.

Commands to help with crosslinking
----
dtmfEnable enables the non-IRLP part of rtpDir.
dtmfDisable disables the non-IRLP part.
dtmfIRLPon enables the IRLP part of rtpDir. dtmfIRLPoff disables the IRLP part.

The commands dtmfDisable,dtmfEnable,
dtmfIRLPoff,dtmfIRLPon
are sent from your Echolink radio/HT interface.
Similar dtmf commands exist for a user using the Asterisk radio/HT interface.
For enabling/disabling IRLP from the Asterisk radio/HT:
  ast_dtmf_cmd=.irlpon 19
  ast_dtmf_cmd=.irlpoff 20
For enabling/disabling non-IRLP nodes from the Asterisk radio/HT:
  ast_dtmf_cmd=.enable 22
  ast_dtmf_cmd=.disable 21

.irlpon, irlpoff, .enable, .disable are also remote text commands
that can be used by an administrator to enable/disable IRLP and the non-IRLP part of rtpDir.

For the IRLP owner that uses the IRLP board to control rtpDir
there are also commands in /home/irlp/custom/

```
custom_decode
to enable/disable the non-IRLP part of rtpDir
For example:
   The IRLP dtmf B0 will disable the non-IRLP part of
rtpDir.
   if [ "$1" = "B0" ] ; then rtpDir_EL_disable ; exit
1 ; fi

   The IRLP dtmf B1 will enable  the non-IRLP part of
rtpDir.
   if [ "$1" = "B1" ] ; then rtpDir_EL_enable ; exit
1 ; fi

   And of course the IRLP owner using the IRLP board
has special
   IRLP commands to enable/disable the IRLP part of
rtpDir.

CHANGES
=======

  Changes in the current release(v1.60)
  ------------------------------------
  Added in 5198.conf, Echolink dtmf options:
     dtmfDeafDstar=32
     dtmfUndeafDstar=33
  to "DEAF" and "UNDEAF" the dstar connection using
Echolink dtmf tones,

  Added in 5198.conf asterisk dtmf options:
     ast_dtmf_cmd=.dstarDeaf 21
     ast_dtmf_cmd=.dstarUndeaf 22
  to "DEAF" and "UNDEAF" the dstar connection using
asterisk dtmf tones.

  Added IRLP scripts:
     rtpDir_Dstar_deaf
     rtpDir_Dstar_undeaf
  to "DEAF" and "UNDEAF" the dstar connection using
IRLP dtmf tones.
```

```
  Added remote text commands:
     .dstarDeaf
     .dstarUndeaf
  to "DEAF" and "UNDEAF" the dstar connection using
remote text commands.

  Added in 5198.conf, option
     dstarIsDeaf
  to mark the dstar connection as "DEAF" whenever
  the dstar node connects or re-connects to rtpDir.

  NOTE:
    When a node is marked as "DEAF", noone can transmit
to that node,
    which means we can only receive from that node but
we can not talk to that node.

    This is different from the MUTE option,
    which means that we can transmit to that node but
    we can not receive from it.

  Changes in previous releases
  ---------------------------
  Removed the option remDstar from the config file
5198.conf
     and placed dstar nodes in the file dstar5198.txt
     You can add as many dstar nodes as you like in the
file dstar5198.txt
     Added a sample file dstar5198.txt
  Added config option dstarFile=... in 5198.conf

  Use the highest quality audio codec between
     Asterisk and non-Asterisk(IRLP,Echolink,dstar)
nodes.

  You must download the latest chan_rtpdir.c Asterisk
     channel driver from the yahoo group,
     copy it into the Asterisk channels
     sub-directory and re-build Asterisk so that
Asterisk
     will use the latest chan_rtpdir.c driver.
```

When running it as an IRLP reflector, the codec that the
IRLP connecting station uses can get lost if there is a temporary
loss in connectivity due to ISP problems.
In these cases, GSM will be assumed as a codec for that station that
timed out until the station transmits again and the codec becomes known
to the reflector.
The same situation will occur if you bring down the reflector
while IRLP nodes are connected to it. GSM codec will be assumed,
because as an IRLP reflector we can not determine the codec
of the connecting station by examining the contents of the
/home/irlp/local/codec because that file will not exist,
and of course there is no such directory on Windows platforms
or Linux platforms that have no IRLP node installations.
It is known when IRLP stations connect to an IRLP reflector,
they transmit a couple of bursts to the reflector and that is
how the codec is determined, but during timeouts the IRLP
connecting station is not transmitting any bursts, so when
it re-connects to the reflector on the control port,
GSM codec will be assumed, until the IRLP station starts
transmitting its first burst.

Speak-Freely clients(sfmike) or clients that use imike
will have their IP address shown, because Speak-

Freely(sfmike)
     and imike can fake their callsign/name, so to avoid duplicates
     the IP address of the connecting station that uses IRLP or
     Speak-Freely protocol will be shown.
     This is used only when rtpDir runs as an IRLP reflector/conference.

  Added config option fileplay_delay measured in ms.
  This is used when playing announcemenst from files,
  sending welcome audio to users, announcing callsigns,...

  Full dtmf control over the dstar node,
  Full dtmf control over the Asterisk node.

  Add invertCD, invertCTS and invertDSR options
     required for the Echolink radio/radio interfaces that expect
     one the CD, CTS, DSR serial port pins ot be inverted.

  Codec conversions are automatic.

  txDelay config variable is now measured in MILLISECONDS
     to reduce hang-up time.

  Port <---> channel switching for IRLP reflectors.

  ...
  ...
  ...

HARDWARE REQUIREMENTS
=====================
  rtpDir can run on all Linux machines and all
     Windows PC's.
  How fast it runs, depends on your
     machine and your ISP.

WARNING
=======
  We have not tested the software
     on a machine other than x86 arch(little endian/
Linux or Windows).
  All Linux flavors supported and all Windows boxes.
  We have received reports that it runs on Vista with
no problems.
  We received reports
     that it runs on 64-bit platforms with no problems.

OTHER SOFTWARE REQUIREMENTS
===========================
  For Windows, download the pre-built Windows
Qt-4.x.zip runtime package
     from the yahoo group.
  For Windows, rtpDir needs Qt 4.3.0 release or above
to run correctly.
  Qt for Windows is a Trolltech product.

  For Linux, download the pre-built Linux Qt-4.x.tar.gz
runtime package
     from the yahoo group.
  For Linux, rtpDir needs Qt 4.3.1 or above to run
correctly.
  Qt for Unix/Linux is a Trolltech product.

INSTALLATION
============
  WINDOWS:

  Create a new and empty directory C:\rtpDir
  Extract the files out of the Qt-4.x.zip
     runtime package into the directory C:\rtpDir
  Extract the files out of rtpDir-1.60-exe.zip
     into the same directory C:\rtpDir
  At this point, all files from both packages
     are in the directory C:\rtpDir

If you will be making connections to dstar/dextra_srv nodes or dstar XRF reflectors,
download and configure the dextra_client package for Windows.

You are done with the Windows installation.
Proceed with the CONFIGURATION.

LINUX

You can install any Linux distro,
but if you want to run rtpDir which needs a GUI
then you better make sure your Linux distro
includes a GUI, unless you dont care about it
and want to run Linux in text mode.
For Linux running in text mode, then install
rtpDir_tm which runs in text mode only
and does not need a Linux GUI desktop.

Again, you can install a Linux distro without having a
GUI. In that case you will be using rtpDir_tm and not rtpDir.

If you will be making connections to dstar/dextra_srv nodes or dstar XRF reflectors,
download and configure the dextra_client package for Linux.

For connecting to asterisk nodes, download chan_rtpdir.c and build it into the asterisk server.

If you decide to install IRLP,
make sure that you install IRLP under /home/irlp directory.

If you install a KDE or GNOME desktop or just the Xorg
server software, or you already have a graphical
desktop on your Linux box and you get the error

"AUDIO DEVICES NOT SET CORRECT"

whenever you try to start IRLP or whenever you try to connect
to another IRLP node, put the following command
in the /home/irlp/custom/rc.irlp file just after
the #!/bin/bash line:

chmod o+rw /dev/audio /dev/mixer /dev/dsp

The above command will set the audio devices for use with
IRLP user repeater which the IRLP software uses to make calls
and accept calls.

However, if you still do not want to run rtpDir
in a graphical environment, then use the text mode version,
rtpDir_tm. That package does not require a Linux GUI installation.

If you want to use Asterisk with rtpDir/rtpDir_tm,
we recommend the Asterisk ACID CD install or the Asterisk EVB CD install.
Both ACID or EVB CD's include CentOS 5.x linux plus the
Asterisk package. On top of that install
the IRLP software from IRLP NET if you choose to
have IRLP on your Linux distro.
Again, we must underline the fact that rtpDir(GUI)
or rtpDir_tm(text mode) can run alone on a Linux platform
without Asterisk or IRLP.
But most people prefer to combine VoIP networks
to form some kind of a cluster so to speak.
Sometimes a Linux CD may be missing the aumix and/or
the ncftp utilities(ncftpget, ncftpput), so download them
from the "Files" section of of the the yahoo group.
aumix and ncftpget,ncftpput are used by IRLP

and they are required to be in /usr/bin directory.

Installation of the rtpDir/rtpDir_tm software must be done with
the user logged in as root.
Now download the following required packages:

Download Qt-4.x.tar.gz into the /root directory.
Execute the following commands:
   gunzip Qt-4.x.tar.gz
   tar xvf Qt-4.x.tar
(The above package is required for the rtpDir_tm version of the bridge also)

Download rtpDir-1.60.tar.gz into the /root directory.
Execute the following commands:
   gunzip rtpDir-1.60.tar.gz
   tar xvf rtpDir-1.60.tar

At this point all the files from both packages are in the directory /root/runtime.
Rename the directory /root/runtime to /root/rtpDir

Create a directory /root/rtpDir/so_files/

Move the libraries libQtCore.so.4.3.1, libQtGui.so.4.3.1 and libQtNetwork.so.4.3.1
from /root/rtpDir/ directory to /root/rtpDir/so_files/ directory
Go to the /root/rtpDir/so_files/ directory.

Now you will create the the symbolink links to the Qt libraries that exist
in the /root/rtpDir/so_files/ directory.

Execute each of the following 9 LINK commands one at a time:
(The Linux ln command will be used)

ln -s libQtNetwork.so.4.3.1 libQtNetwork.so
ln -s libQtNetwork.so.4.3.1 libQtNetwork.so.4

```
  ln -s libQtNetwork.so.4.3.1 libQtNetwork.so.4.3

  ln -s libQtGui.so.4.3.1 libQtGui.so
  ln -s libQtGui.so.4.3.1 libQtGui.so.4
  ln -s libQtGui.so.4.3.1 libQtGui.so.4.3

  ln -s libQtCore.so.4.3.1 libQtCore.so
  ln -s libQtCore.so.4.3.1 libQtCore.so.4
  ln -s libQtCore.so.4.3.1 libQtCore.so.4.3


  Now, verify that you actually created the links
correctly.
  Execute this command:   ls -la

  You should see some output similar to the following:

     libQtNetwork.so -> libQtNetwork.so.4.3.1
     libQtNetwork.so.4 -> libQtNetwork.so.4.3.1
     libQtNetwork.so.4.3 -> libQtNetwork.so.4.3.1
     libQtNetwork.so.4.3.1

     libQtGui.so -> libQtGui.so.4.3.1
     libQtGui.so.4 -> libQtGui.so.4.3.1
     libQtGui.so.4.3 -> libQtGui.so.4.3.1
     libQtGui.so.4.3.1

     libQtCore.so -> libQtCore.so.4.3.1
     libQtCore.so.4 -> libQtCore.so.4.3.1
     libQtCore.so.4.3 -> libQtCore.so.4.3.1
     libQtCore.so.4.3.1

  CREATE the rtpDir software
  --------------------------
  Go back to the /root/rtpDir directory.

  There is a script file "create2_rtpDir.sh"
     that you will execute to create the rtpDir(GUI)
software.
  To create rtpDir_tm(text mode only, no GUI stuff)
     use the create2_rtpDir_tm
```

More info about rtpDir_tm bridge can be found in the rtpDir_tm.txt file
which is also posted in the "Files" section of the yahoo group.

We've tested the script on CentOS, Fedora, Suse,
Red Hat, Debian, Ubuntu and other Linux systems.
The create2_rtpDir.sh can use either the g++ command
or the gcc command.
Some Linux systems are missing the g++ software.
You can either download it or use gcc command.
Open the script create2_rtpDir.sh and use either g++ or gcc

(Do the same with the create2_rtpDir_tm.sh script if you are trying
to build rtpDir_tm)

Execute the script create2_rtpDir.sh
like this: ./create2_rtpDir.sh

or for Linux text mode with no desktop:
./create2_rtpDir_tm.sh

If you get any errors from the script, will
probably be because other libs referenced by the script
are missing the symbolic links in /usr/lib directory
and/or in the /usr/X11R6/lib(rtpDir GUI needs X11 libs) directory.
(rtpDir_tm bridge does not need X11 GUI libs).

rtpDir needs the following libs preinstalled:
the math lib(-lm), (Expected to be in /usr/lib directory)
the X11 libs(-lXext, -lX11), (Expected to be in /usr/X11R6/lib directory or /usr/lib)
pthreads lib(-pthread), (Expected to be in /usr/lib directory)
the alsa sound lib(-lasound). (Expected to be in /usr/lib directory)

rtpDir_tm needs the same libraries except the X11 and alsa sound.

If the required library is installed but not where create2_rtpDir.sh expects
to find it, it is easy to create a symbolic link to it in /usr/lib
(or /usr/X11R6/lib as the case maybe)

For example, on some Linux systems the alsa sound library is installed in /lib
and not /usr/lib where create2_rtpDir.sh expects it to be.
In that case create a symbolic link as follows:
Go to the /usr/lib directory and execute the command:
ln -s /lib/theREAL_alsa_sound_library libasound.so
Of course, replace theREAL_alsa_sound_library with the
correct alsa library filename on your system.
And make sure theREAL_alsa_sound_library is not a symbolic link but the
the actual library itself.

On other Linux systems, the required library is installed in the correct
place, but its symbolic link is missing.
So go to the directory where the library is installed and
create the symbolic link with the "ln -s" command.
as in: ln -s existing_LIBRARY_file_NOT_A_LINK new_LINK_name.so

Assuming the script finished without errors,
verify with the command:

ldd rtpDir

```
        or
     ldd rtpDir_tm    (if you are building rtpDir_tm)

  Check the output to make sure that all runtime
library dependencies
     have been resolved.
  The next step is to remove debugging info from the
executable
  to force the executable to have a smaller memory
footprint.
  Execute this:  strip rtpDir

  Additional steps if you plan to run rtpDir/rtpDir_tm
with *Asterisk* enabled.

-------------------------------------------------------
-------------------------
  in /etc/asterisk/rpt.conf you must have under a
specific Asterisk node
  the rxchannel config entry set to this:

   rxchannel=rtpdir/127.0.0.1:4570:4670

   where 4570 is the localASTport,
   and   4670 is the remoteASTport.

   If you will be connecting to a remote rtpDir/
rtpDir_tm bridge,
   then replace 127.0.0.1 with the remote IP address
   where rtpDir bridge is running.

  The latest Asterisk module file chan_rtpdir.so must
be placed under
  the /usr/lib/asterisk/modules/  directory
  You better download a copy of chan_rtpdir.c
  from the yahoo group, in the "Files" section
  because that is the correct one to use with rtpDir/
rtpDir_tm bridge.
  It must also say this in the comment section:

      Version 0.6-NO-SEQUENCE-NUMBERS Sun Sep 28
```

12:03:31 EDT 2008.
      PUT BACK THE WAY IT WAS BEFORE, SEQUENCE NUMBERS NOT NEEDED.
      TEXT HANDLING IS OUT. IRLP DOES NOT PROCESS TEXT.
      THIS DRIVER USES UNCOMPRESSED HIGH_QUALITY AUDIO.

  Other copies of chan_rtdir.c driver may be version 0.6 or later but
  will NOT work with rtpDir/rtpDir_tm bridge.
  So, download chan_rtpdir.c and place it under the Asterisk channels
  directory and then build the Asterisk server, no exceptions here.

  The latest module file app_rpt.so must be placed under
  the /usr/lib/asterisk/modules/ directory
  and it must be at least version version 0.121
  The source file app_rpt.c is alreasy included with
  the ACID or EVB distributions of Asterisk.

  To disable use of the sound card by Asterisk
  remove chan_oss.so and chan_alsa.so from /usr/lib/asterisk/modules
  directory or to force Asterisk to use a different sound card
  change the values in /etc/asterisk/oss.conf and /etc/asterisk/alsa.conf
  or do not let asterisk load these by modifying /etc/asterisk/modules.conf
  and adding the noload command.
  Example in /etc/asterisk/modules.conf file:
     noload=chan_oss.so
     noload=chan_alsa.so

  To disable use of the sound card by IRLP,
  remove imike and ispeaker command lines from 5198.sh, 5198_tm.sh start-up scripts,
  or force IRLP to use another sound card installed.
  For example, to let imike use the second sound card installed

on the Linux box: imike -Y/dev/dsp1 ....(rest of parameters...)
ispeaker can also be forced to use the second sound card installed:
ispeaker -Y/dev/dsp1 ...(rest of parameters...).
(You also have to change the IRLP script wavplay to
to pass the correct sound device to the play command line).
(Recommendations by Steve/N9YTY)

To disable use of the sound card by rtpDir, set
soundCard=no in the 5198.conf file for rtpDir bridge,
or set soundCard=yes but force rtpDir to use another
sound card by changing insci and outsci configuration
parameters in the 5198.conf file.
(rtpDir_tm does not use a sound card at all and it is
a pure reflector.)

Probably you have realized by now that IRLP,*Asterisk* and
rtpDir will compete for the sound card if there is only one
installed.
You have to decide which type of node is really connected
to a radio and enable the sound card device to be used
by only that node.

If your conference has reached its maximum number of connected
stations and an *Asterisk* node tries to connect,
the packets will be silently dropped. The same thing will
happen if you set your conference station to "BUSY",
or set your conference to "PRIVATE" and the incoming
Asterisk node is not listed in the PRIVATE list.

Some *Asterisk* settings are useful when linking
Asterisk with rtpDir bridge conference.
In rpt.conf configuration file:

These following settings should be used for any link-to-link interface in rpt.conf:

```
duplex=0
linktolink=yes
hangtime=0
```

duplex=0 disables all courtesy tones,
but without linktolink=yes, you will only be operating in half-duplex mode.
hangtime=0 disables the squelch tail.

A few more things to do:

remove these files from the /usr/src/asterisk/channels directory:

```
chan_echolink.c
chan_echolink.so
chan_irlp.c
chan_irlp.so
```

remove these files from the /usr/lib/asterisk/modules

```
chan_echolink.so
chan_irlp.so
```

remove these files from the /etc/asterisk directory

```
echolink.conf
irlp.conf
```

Also, make sure you have these statements in /etc/asterisk/modules.conf under the [modules] section:

```
noload=chan_echolink.so
noload=chan_irlp.so
noload=chan_oss.so
noload=chan_alsa.so
```

The only files that are required are:
/usr/src/asterisk/channels/chan_rtpdir.c

```
  and make sure
  that in /etc/rpt.conf one of your nodes has this:
  rxchannel=rtpdir/0.0.0.0:4570:4670

  because it will be chan_rtpdir driver and
  rtpDir(or rtpDir_tm) server that will
  provide access to IRLP, Echolink and dstar.

  The Asterisk CD ISO's, that most people install,
expect that you
  have a modified USB sound fob (cost is $5) or a URI
board(cost is $99)
  If one of these is not plugged in when you start
Asterisk or
  when the system boots, then the Asterisk server
crashes and it
  becomes a "ZOMBIE" process and Asterisk becomes
unsuable.
  So, if you dont have one of these boards or one of
them is not installed
  and plugged in, or you dont intend to TX/RX using one
of these boards,
  but want to TX/RX using rtpDir bridge,
  remove /usr/lib/asterisk/modules/chan_usbradio.so,
  remove /etc/asterisk/usbradio.conf
  and add the noload statement
  noload=chan_usbradio.so to /etc/asterisk/modules.conf
file
  Also remove rxchannel = Radio/usb
  from all nodes in /etc/asterisk/rpt.conf
  if you dont have a URI or a USB sound fob plugged in.

  After making the above changes to the Asterisk
directories,
  go to the Asterisk directory: /usr/src/asterisk
  and execute these 2 commands to rebuild your Asterisk
server:

  gmake
  gmake install
```

You must enable *Asterisk* connects to rtpDir bridge
by setting correct values in the rtpDir bridge config file 5198.conf file
or 5198_tm.conf file.
See settings below.

Additional steps if you plan to run rtpDir/rtpDir_tm in Echolink + IRLP mode

---

NOTE: These steps are not required if you will be running rtpDir as an IRLP
reflector(refXXXX or expXXXX).
Also these steps are not required if you are installing rtpDir on Windows,
because IRLP station node software can only run on Linux.
So, on Windows, you can only run rtpDir as an IRLP reflector refXXXX or expXXXX
by setting accessIRLP=no

These steps are required only if you have installed an IRLP node stnXXXX
and you intend to activate the IRLP station node at the same time
rtpDir is running.

rtpDir will run as an IRLP reflector refXXXX or expXXXX, if accessIRLP=no
rtpDir will run as an IRLP station node stnXXXX if accessIRLP=yes and
you are running rtpDir on Linux and have installed the IRLP station node
software under /home/irlp directory.

These steps must also be done while still logged on as user root.
SKIP THIS SECTION, IF YOU ARE USING WINDOWS OR IF YOU DONT HAVE AN IRLP NODE

Make sure that you've installed IRLP under /home/irlp directory.
Very first thing is to edit the /home/irlp/custom/ environment file
and set the codec to ADPCM.

We recommend that you back up the original IRLP files before you make the changes.
The IRLP files that will have to be changed to convert your IRLP node to
Echolink + IRLP are as follows:

```
/home/irlp/scripts/on
/home/irlp/scripts/on_to_remote
/home/irlp/scripts/call
/home/irlp/scripts/connect_to_reflector
/home/irlp/scripts/experimental_call
/home/irlp/scripts/control
/home/irlp/scripts/irlp_reset
/home/irlp/scripts/sfswrapper
/home/irlp/scripts/dropcall
/home/irlp/scripts/end
/home/irlp/scripts/off
/home/irlp/custom/custom_decode
/home/irlp/custom/update-file-list
```

So, backup the above IRLP files, before going on any further.

To be able to go back to a standalone IRLP without the Echolink part
then the above files must be re-installed with their original contents
before the following changes:
(Of course, another way is to disable the Echolink part completely
using one of the new dmtf/script commands listed below)

Now stop your IRLP node stnXXXX if it is already running
by executing the following commands:

```
killall mynetd
killall dtmf
```

Make sure your /home/irlp/custom/environment file uses GSM codec or ADPCM.
(u-Law can also be used).

Also make sure that you have this set:

```
export NOUPDATE=YES
```

The above export statement inside the /home/irlp/custom/environment file
will make sure that the IRLP does not overwrite the changes that you
are about to make to your IRLP node stnXXXX to make it work
in "IRLP + Echolink" mode.

Copy the following scripts into the /home/irlp/scripts directory:

rtpDir_ALL_discon:	Disconnects all stations.
rtpDir_EL_discon :	Disconnects Echolink stations only.
rtpDir_EL_disconX:	Disconnects one Echolink station only.
rtpDir_EL_con:	Connects to an Echolink node
rtpDir_EL_disable:	Disables the Echolink part
rtpDir_EL_enable:	Enables the Echolink part
rtpDir_EL_reconnect:	Reconnects to the last connected Echolink node. Added by NO3Y
rtpDir_IRLP_discon:	Disconnects the IRLP connection
rtpDir_IRLP_failure:	Notifies rtpDir of an IRLP call failure.(Never called by user)

```
  rtpDir_IRLP_reconnect:         Reconnects to the last
connected IRLP node.
  rtpDir_IRLPref_con:            Connects to an IRLP
refXXXX.
  rtpDir_IRLPexp_con:            Connects to an IRLP
expXXXX.
  rtpDir_IRLPstn_con:            Connects to an IRLP
stnXXXX.
  rtpDir_IRLP_callref.sh         Connects to an IRLP
refXXXX(Called from GUI only)
  rtpDir_IRLP_callexp.sh         Connects to an IRLP
expXXXX(Called from GUI only)
  rtpDir_IRLP_callstn.sh         Connects to an IRLP
stnXXXX(Called from GUI only)
  rtpDir_IRLP_endcall.sh         Disconnects the IRLP
connection(Called from GUI only)
  rtpDir_AST_con                 Sends dtmf commands to
the Asterisk node by using "rtp fun node ..."
  rtpDir_rec                     starts/stops recording
audio packets from Asterisk,IRLP,Echolink nodes.
  rtpDir_play                    starts/stops playback
to Asterisk, IRLP,Echolink nodes.
  rtpDir_conx                    report any nodes
connected to rtpDir/rtpDir_tm bridge.
  rtpDir_Dstar_cmd               connects and
disconnects from dstar nodes.
  rtpDir_Dstar_deaf              marks as "DEAF" the
dstar connection.
  rtpDir_Dstar_undeaf            removes the "DEAF"
mark from the dstar connection.

  Also copy these IRLP scripts from the rtpDir package
into the /home/irlp/scripts directory:
  (You may be be asked if you want to
   overwrite the existing file,  answer yes to each
question).

  on
  on_to_remote
  connect_to_reflector
  experimental_call
```

```
  call
  control
  irlp_reset
  dropcall
  off
  end
  sfswrapper

  Go to /home/irlp/scripts directory and execute these
commands:
  chown repeater:repeater rtpDir_*
  chmod  +x  rtpDir_*
  chmod o-rx rtpDir_*

  Add the following lines to /home/irlp/custom/
custom_decode file, just before the "exit 0" line
  which is at the end of the file.

  # The next lines to the end of the /home/irlp/custom/
custom_decode file must be the last lines
  # just before the "exit 0" line.

  # Sets the non-IRLP part of rtpDir to busy.
  # First disconnect each station.
  #    then use this command to disable the non-IRLP
part of rtpDir.
  #    Echolink stations will not make it thru
  #    Asterisk stations will not make it thru
  #    dstar stations will not make it thru.
  #    IRLP station will make it thru if accessIRLP=yes
  #       otherwise IRLP stations will not make it
thru.
  #    Remember that accessIRLP=yes then you are
running an IRLP node stnXXXX
  #                  accessIRLP=no then you are running
an IRLP reflector refXXXX or expXXXX
  if [ "$1" = "B0" ] ; then rtpDir_EL_disable ; exit
1 ; fi

  # The opposite of the above. Enable the non-IRLP part
of rtpDir.
```

```
  if [ "$1" = "B1" ] ; then rtpDir_EL_enable ; exit 1 ;
fi

  # disconnect all stations
  if [ "$1" = "B2" ] ; then rtpDir_ALL_discon ; exit
1 ; fi

  # dtmf B3xyz connects to Echolink node xyz
  # Example:  B39999  connects to Echolink node# 9999
which is *ECHOTEST*
  if [ ${1#B3} != $1 ] ; then rtpDir_EL_con ${1#B3} ;
exit 1 ; fi

  # Reconnect last EchoLink node
  # Assuming the machine on which IRLP is running did
not reboot since the last
  #   Echolink call was made.
  if [ "$1" = "B4" ] ; then rtpDir_EL_reconnect ; exit
1 ; fi

  # Disconnect Echolink stations only
  if [ "$1" = "B5" ] ; then rtpDir_EL_discon ; exit 1 ;
fi

  # connect to an IRLP stnXXXX
  # example B63249 will connect to stn3249
  # always disconnect from IRLP first
  if [ ${1#B6} != $1 ] ; then rtpDir_IRLP_discon ;
rtpDir_IRLPstn_con ${1#B6}; exit 1 ; fi

  # connect to an IRLP refXXXX
  # example B79990 will connect to ref9990
  # always disconnect from IRLP first
  if [ ${1#B7} != $1 ] ; then rtpDir_IRLP_discon ;
rtpDir_IRLPref_con ${1#B7}; exit 1 ; fi

  # disconnect IRLP connection ONLY
  if [ "$1" = "B8" ] ; then rtpDir_IRLP_discon ; exit
1 ; fi

  # Reconnect last IRLP node.
```

```
  if [ "$1" = "B9" ] ; then rtpDir_IRLP_discon;
rtpDir_IRLP_reconnect ; exit 1 ; fi

  # Sends a dtmf command to the local Asterisk server
  #     by using this: asterisk -rx "rpt fun astNode
command".
  # The astNode used is the one pointed to by the
config variable astNode=
  # The Asterisk server must be running.
  # Example: IRLP user sends this dtmf: B12*32000
  #    That will request a connect to Asterisk node
2000, using your local astNode.
  # Example: IRLP user sends this dtmf: B12*12000
  #    That will request a disconnect from Asterisk
node 2000, using your local astNode.
  # In /etc/asterisk/rpt.conf, the node astNode is the
one running the rtpdir driver.
  # All Asterisk "rpt fun ..." dtmf commands are
accessible this way.
  # Shortcuts can be added also.
  if [ ${1#B12} != $1 ] ; then rtpDir_AST_con ${1#B12};
exit 1 ; fi

  # dtmf C1xyz disconnects from Echolink node xyz
  # Example:  C19999  disconnects from Echolink node#
9999 which is *ECHOTEST*
  if [ ${1#C1} != $1 ] ; then rtpDir_EL_disconX
${1#C1} ; exit 1 ; fi

  # Start/Stop recording from all connected nodes.
  # Example: C2
  if [ "$1" = "C2" ] ; then rtpDir_rec ; exit 1 ; fi

  # Start/Stop playback to all connected nodes.
  # Example: C3
  if [ "$1" = "C3" ] ; then rtpDir_play ; exit 1 ; fi

  # report connected nodes
  # Example: C4
  if [ "$1" = "C4" ] ; then rtpDir_conx ; exit 1 ; fi
```

```
  # dtmf C51 disconnects from any connected dstar node
and connects to the dstar node
  #    pointed to, by the 1st entry in the file
dstar5198.txt
  # dtmf C52 disconnects from any connected dstar node
and connects to the dstar node
  #    pointed to, by the 2nd entry in the file
dstar5198.txt
  #
  # dtmf C53 ....and so on
  #
  # Special Case: C50 just disconnects from the dstar
node.
  if [ ${1#C5} != $1 ] ; then rtpDir_Dstar_cmd
${1#C5} ; exit 1 ; fi

  # connect to an IRLP expXXXX
  # example C60013 will connect to exp0013 IRLP
experimental reflector
  # always disconnect from IRLP first
  if [ ${1#C6} != $1 ] ; then rtpDir_IRLP_discon ;
rtpDir_IRLPexp_con ${1#C6}; exit 1 ; fi

  # mark the dstar connection as DEAF
  if [ "$1" = "C7" ] ; then rtpDir_Dstar_deaf ; exit
1 ; fi

  # Un-Deaf the dstar connection
  if [ "$1" = "C8" ] ; then rtpDir_Dstar_undeaf ; exit
1 ; fi


  Make sure that B0 ... C8 dtmf prefix codes are not
currently being used in your
  /home/irlp/custom/custom_decode file on another line.
  You can add more dtmfs that you can use on your IRLP
radio to control other parts
  of the rtpDir bridge. For every new dtmf that you
add, create a script file.
  You can even add dtmf shortcuts if you want.
```

Make sure the file /home/irlp/custom/update-file-list contains at least the
following lines:
(If the file /home/irlp/custom/update-file-list does not exist, create it and then add
the following lines)

```
--exclude on
--exclude on_to_remote
--exclude connect_to_reflector
--exclude call
--exclude custom_decode
--exclude sfswrapper
--exclude control
--exclude dropcall
--exclude off
--exclude end
--exclude irlp_reset
--exclude experimental_call
```

It is very important that you put all the IRLP files names (on,...experimental_call)
into the file /home/irlp/custom/update-file-list, otherwise
IRLP will overwrite these files and your "Echolink + IRLP" node will not
work as it should.

If the file /home/irlp/custom/update-file-list did not exist before and you just created it,
Go to the /home/irlp/custom/ directory and execute this command:
chown repeater:repeater update-file-list

WARNING: With the above changes to IRLP files, you have changed your IRLP node from
IRLP to "Echolink + IRLP".
To run IRLP without rtpDir, remove the above changes to the IRLP files,
and then you can run IRLP standalone with no Echolink capabilities.

or disable Echolink while still running rtpDir/rtpDir_tm in "Echolink + IRLP"

Next step:
Copy the software rtpDir_signal to /home/irlp/bin directory.
Go to the /home/irlp/bin directory and execute the following commands:

```
chown repeater:repeater rtpDir_signal
chmod 750 rtpDir_signal
```

Last step: download the text file "connect_and_disconnect_from_reflectors.txt"
from the same group and study it.
It points out the fact that you must use certain IRLP dtmfs
to connect to and disconnect from IRLP reflectors.

You are done with the installation.
Proceed with the CONFIGURATION.

CONFIGURATION

rtpDir/rtpDir_tm is run with 2 parameters on the command line.
The first parameter is the configuration file. The second
parameter is a log file. The configuration file must exist and
must have read access. The log file does not have to exist
but the directory where the log file will be created
must have write permissions.
Both file names must be given on the command line. No defaults are implied. File names must include full path
or no path at all. If no path is specified, then current
directory will be used.

A sample configuration file 5198.conf for rtpDir(GUI) and 5198_tm.conf for rtpDir_tm
rtpDir(GUI is for Windows or Linux, rtpDir_tm is for Linux text mode only).
Most of the entries are already filled in but the following
configuration variables have to be changed:
Look in the sample file 5198.conf for rtpDir or 5198_tm.conf
for rtpDir_tm. Remember rtpDir_tm runs on Linux only.
rtpDir runs on both Linux and Windows.

```
   call
   password
   name
   qth
   e-mail

   # insci and outsci, dont need to be changed if
   #    soundCard=no or call is a *CONFERENCE* callsign
   insci
   outsci

   # EL_node is your Echolink node#
   # You can use any number here, it does not have
   # to be your Echolink node number.
   # This is used to detect collisions.
   # Even if you do not use your Echolink node number,
   #    the rtpDir bridge will still display your
correct Echolink
   #    node number when it starts.
   EL_node

   # VERY IMPORTANT,
   # irlpNode must have a correct value which is
   #    something like stnXXXX where XXXX is your 4-
digit IRLP node number
   # If you dont have an IRLP node, set it to stn0000
   # Your IRLP node
   irlpNode
```

```
   There are so many other configurations entries you
can set to
   control the operation of the rtpDir bridge.
   We recommend that you go thru each one of them so
that any problems
   you may get while running the rtpDir bridge can be
identified.

      Configuration file format.
      Lines starting with '#' are comments and not
processed
         by the built-in parser.
      All must be supplied or else the program will not
start.
      If program fails to start, check the log file
5198.log
         for errors.
      Unless otherwise noted, entries refer to the
Echolink network.

-------------------------------------------------------
-------

      # CALLSIGN must be in UPPERCASE
      call=YourCallSign
      password=YourPassword
      name=YourName
      qth=YourLocation
      email=YourEmail

      # You can use multiple servers for login/
downloads.
      server=server1.echolink.org
      server=server2.echolink.org
      server=server3.echolink.org

      # Is this an Echolink network? yes or no
      # If EL_login=yes, your node will be registered
with
      #    the Echolink server(s) and you will then
have to set
```

```
      #    the option loadStnFile to yes or no.
      #    If loadStnFile=yes, a local file pointed to,
by the option stnFile
      #       will be used as a station list.
      #    If loadStnFile=no, a station list will be
downloaded
      #       from the Echolink server(s).
      #
      # If EL_login=no, your node will NOT be
registered with
      #    the Echolink server(s) and the software will
force
      #    the option loadStnFile to yes so that a
local file
      #    pointed to, by the option stnFile will be
used as a station list.
      #
      EL_login=yes

      # myIP is your Echolink IP address, leave it as
      #   0.0.0.0 if you dont know it,
      #   or use an IP address assigned
      #   to you by the ISP if you're not using a
router/firewall.
      #   If you are behind a router/firewall,
      #   use the private IP address assigned to you
      #   by DHCP or the static private IP address
      #   that you assigned to your machine.
      #   DO NOT use the public IP address of
      #   your network. If you get the error
      #   "Could not start rtpDir,error=The 'bind' call
for the RTP socket failed"
      #   use either 0.0.0.0 or
      #   the private IP address 192.168.x.x
      #   In any case, we recommend using 0.0.0.0 in
case you get
      #   the above error in the log file.
      #   This IP address can be different from
      #   the myIRLP_IP address.
      myIP=0.0.0.0
      #
```

```
      # port is your Echolink tx/rx port.
      #   Although you specify 5198,
      #   both 5198 and 5198 + 1 will be opened.
      #   5198(audio, text) and 5198 + 1=5199(control
messages)
      #   are both UDP ports and used for connections
to other stations.
      #   Another port is TCP port 5200 which is used
for downloads,
      #   but not listed anywhere in the config file.
      #   If you choose any other port, it reverts back
to 5198.
      #   If EL_login=no, then you can choose any port
you
      #   like. See EL_login, loadStnFile and stnFiles
option.
      port=5198

      # Open the soundcard?(yes or no)
      # if soundcard=no,
      #    then sound card device is not opened.
      # if soundcard=no
      #    then serial port is not opened.
      # WARNING:
      # If you have installed and started IRLP, unless
you have 2 sound cards,
      # you must set soundCard=no , otherwise the IRLP
imike software will fail
      # to start when an IRLP connection is requested.
      # Setting soundCard=yes means that you intend to
control your Echolink repeater or
      #   link and you have a compatible Echolink link
interface like VA3TO board
      #   or rigblaster or something similar.
      # Setting soundCard=no means that you do not have
a sound card and
      #   you intend to run rtpDir an an Echolink
conference or IRLP reflector/Echolink conference.
      #   It could also mean that you DO have a sound
card but you have installed
      #   IRLP and you intend to control your IRLP
```

```
repeater or link and you will be
      #   using your IRLP radio or HT to send dtmfs to
control rtpDir.
      soundCard=yes

      # Sound card device indexes, run showcard
software for correct values.
      # These values will be explained later in this
document.
      # For Linux, it is always 0 and 0 for the first
sound card
      # or 1 and 1 for the second sound card or 2 and 2
for the third sound card ...
      # For Windows, it is 1 and 3 or 1 and 4 or 1 and
5 for the first sound card ...
      # ...but you may have a non-standard soundcard
configuration,
      #    so still run showcard for correct values.
      insci=0
      outsci=0

      # Is audio clipping off ?
      audioClipOff=yes

      # Is audio dithering off ?
      audioDitherOff=no

      # LatencyIN and LatencyOUT are sound card
configuration parameters.
      # Run the program showcard for correct values for
LatencyIN and LatencyOUT
      # These are usually fractional numbers
      LatencyIN=0.011610
      LatencyOUT=0.011610

      # Sample rate for the sound card.
      # It should be set to 8000, which means 8000 Hz(8
KHz)
      # The program showcard will probably report a
default sample
      #   rate of other than 8000, but use 8000 since
```

```
most
      #   VoIP networks expect 8000 Hz
      # You may try to use other values lower or higher
than 8000
      #   to experiment with.
      # In some cases, rtpDir will fail to open the
sound card with rate=8000
      # In such cases, try rate=7999 or rate=8001
      # Consult your soundcard's documentation for
supported rates.
      # In some cases, the soundcard failed to open
with rate=8000
      #   but it opened with rate=8100
      # However using a rate value other that 8000
might not be ideal
      #  for VoIP networks that expect a rate of 8000
Hz.
      # In previous versions of rtpDir, the rate value
of 8000
      #   was used to open the soundcard, but we found
out
      #   that some soundcards will not open with
rate=8000
      #   but they will open with rate=8001 or higher
or
      #   rate=7999 or lower. But remember that the
further you
      #   get from the value of 8000, the higher the
probability
      #   that your audio will not sound OK to the
other participants
      #   in the same VoIP network.  So, even though
you were successful
      #   opening the soundcard, test your audio before
you connect
      #   to another station.
      # If your sound card does not support a sample
rate of 8000,
      #   replace it with one that does.
      rate=8000
```

```
      # After initiating a connection to another node,
      #   how long before we give up, in seconds.
      # Minimum is 40
      conxTimeout=40

      # After trying to login/register with the
servers,
      # how long before we assume
      #   that the server is not responding
      #   and we must try another, in seconds.
      # Minimum is 10
      loginTimeout=10

      # Download timeout in seconds.
      # How long to wait before
      # we assume that the download
      # will never finish and must try
      # again on another server.
      # Minimum is 60 seconds.
      # Give rtpDir ample time to download the list.
      # Even high speed Internet has hiccups
      #  from time to time.
      dnlTimeout=65

      # How often to login in minutes.
      # Setting this to 0, disables
      # the login timer and eventually
      # you will disappear from the Echolink list.
      # Setting this to a number greater than 6
      # may also drop you from the list and it
      # will force a re-login later.
      # A good value is 6.
      loginInter=6

      # How often to download the list of stations,
      #   in minutes.
      # Setting it to 0, disables downloads.
      # Higher than 5 may force a full compressed
      # download, instead of the
      # differential/compressed download which is
preferred.
```

```
refreshInter=5

# Initially login as busy(yes or no)
busy=no

# This option controls both Bridge audio and
# Bridge text.
# Is this a bridge/conference?(yes or no)
# Dont bother running it as a bridge
# using a dial-up modem
bridge=no

# Max connected stations
# Good number for DSL is 8
# Good number for dial-up modems is 1 or 2.
# Good number for cable modems is 50
maxStns=8

# Display current number of users(yes or no)
dispNumUsers=no

# Banner start
banStart=Welcome to rtpDir

# Banner end
# You can have multiple lines for this item.
banEnd=--------------

# Is this a private conference(yes or no)
private=no
# Private File, must have read/write access.
# File must exist. Empty file is OK.
# Full pathname.
#prvFile=C:/rtpDir/prv5198.txt
prvFile=/root/rtpDir/prv5198.txt

# Bookmark file, must have read/write access.
# File must exist. Empty file is OK.
# Full Pathname.
#bookFile=C:/rtpDir/book5198.txt
bookFile=/root/rtpDir/book5198.txt
```

```
      # Banned users file, must have read/write access.
      # File must exist. Empty file is OK.
      # Full pathname.
      #banFile=C:/rtpDir/ban5198.txt
      banFile=/root/rtpDir/ban5198.txt

      # ADMIN callsigns file, must have read/write
access.
      # File must exist. Empty file is OK.
      # Full pathname.
      admFile=/root/rtpDir/adm5198.txt
      #admFile=C:/rtpDir/adm5198.txt

      # The file pointed to, by the option dstarFile,
      #    must have READ access.
      # Full pathname must be used
      dstarFile=/root/rtpDir/dstar5198.txt
      # dstarFile=C:/rtpDir/dstar5198.txt

      # load a station list from a local file, yes or
no.
      # See also EL_login and stnFile options.
      loadStnFile=no

      # Use this local file as a list of stations.
      # Full pathname and file must exist.
      # For the file format, look at the file
stnFile.txt
      # Also see EL_login and loadStnFile options.
      # stnFile=C:/rtpDir/stnFile.txt
      stnFile=/root/rtpDir/stnFile.txt

      # Directory for QSO recordings.
      # Also, all gsm filenames are relative
      # to this directory.
      # Directory must exist with read/write access.
      # For Linux, just an example:
      QSOdir=/root/rtpDir/
      # For Windows, just an example:
      # QSOdir=C:/rtpDir/
```

```
# the download and decompress program.
# Full pathname must be given.
# For Linux, just an example:
fetchpgm=/root/rtpDir/getlist
# For Windows, just an example:
# fetchpgm=C:/rtpDir/getlist_win

# RTCP timeout.
# Minimum value is 5.
# 5 * 10 = 50 seconds
# If after 50 seconds we dont
# receive the RTCP "heartbeat"
# from the remote station, that
# station will be disconnected.
# Why do we multiply the RTCPtimeout by 10?
# Because heartbeat interval is up to 10.
RTCPtimeout=5

# This helps with Country selection.
# If you want only US callsigns to connect
# to your node, then the value
# should be *AKNW.
# *ANKWDFGIJLMOPUVZ469 will allow
# QSOs with civilized countries.
# Consult your ARRL books for
# specific Callsign prefix info.
# Not really 100% Callsign prefix selection,
# but it helps in blocking
# large groups of callsigns  by country.
# An asterisk will allow Conferences.
# This pertains to Echolink stations only.
# Allow callsigns starting with
allowPrefix=*ANKWDFGIJLMOPUVZ469

# Allow repeaters, yes or no
allowRptrs=yes

# Allow links, yes or no
allowLinks=yes
```

```
      # What are the rules for allowing a connect
request?
      #
      # The following checks are done for both outbound
Echolink or IRLP:
      #    Connect requests to your local Echolink node
are not allowed.
      #    Connect requests to your local IRLP node are
not allowed.
      #    Connect requests to nodes already connected
are not allowed.
      #
      #    Connect requests while conxTimeout timer is
active are not allowed.
      #    (Not checked if the IRLP connect is done
from the IRLP radio).
      #
      # Additional checks for outbound Echolink
stations only:
      #   Has capacity limit been reached?
      #   Connect requests are not allowed if your
station is set to Busy
      #   Connect requests to banned stations are not
allowed
      #   If prv checkbox is checked, then connect
requests to stations not
      #      on Private list are not allowed.
      #   Are repeaters allowed?
      #   Are links allowed?
      #   Is callsign prefix allowed?
      #
      # The following checks are done for both inbound
Echolink and IRLP:
      #    For nodes already connected, IP address
change detection is done.
      #    For nodes already connected, an SDES update
is done.
      # Additional checks for inbound Echolink stations
only:
      #    Has capacity limit been reached?
      #    Connect requests are not allowed if your
```

```
station is set to Busy.
      #    Connect requests from banned stations are
not allowed
      #    If prv checkbox is checked, then connect
requests from stations not
      #       on Private list are not allowed.
      #    Are repeaters allowed?
      #    Are links allowed?
      #    Is callsign prefix allowed?
      # Additional checks are done for Inbound IRLP
connect requests only:
      #    If rtpDir is running as a reflector and
      #       capacity limit has been reached, connect
request is rejected.
      #    If rtpDir is running as a reflector and
      #       node is banned(also called lockout-list),
connect request is rejected.
      #    If  rtpDir is running as a reflector and
      #       node is busy, connect request is
rejected.
      #    If  rtpDir is running as a reflector and
      #       prv checkbox is checked, then connect
requests from stations not
      #       on Private list are not allowed.

      # The following checks are done for inbound
*Asterisk* nodes:
      #    Has capacity limit been reached?
      #    Connect requests from banned stations are
not allowed
      #    Connect requests are not allowed if your
station is set to Busy.
      #    If prv checkbox is checked, then connect
requests from stations not
      #       on Private list are not allowed.
      # *Asterisk* nodes do not accept requests from
IRLP or Echolink nodes yet.

      # Your Echolink node
      # If you dont use your own node and
      # a collision is detected, your node
```

```
      # will be set to a random 32-bit value, which
      # does not matter at all. This number is used
      # to detect RTCP collisions, it is not really
      # your node#. We recommend using the Echolink
node# which
      # is unique, so the software will not use a
      # random number for collision detection.
      # Even if you dont use your own Echolink node#
      # your Echolink node number assigned to you by
Echolink
      # will still be displayed in the list.
      EL_node=123456

      # if linkMode=a (meaning ascii), then
      #    ascii commands are sent to the link
interface to control the radio.
      #    For this mode to work, the link interface
must support it.
      #    Check with VA3TO link interface, it is the
best interface
      #    there is.
      #    This interface also has a DTMF decoder on
board and
      #    supports COS and timeouts.
      #
      # If linkMode=s (meaning sound), then
      #    "sound card" mode will be used to control
the radio.
      #    That means RTS/DTR checking and unchecking
serial port pins.
      #    Most other interfaces are of this kind.
      #    And most of them dont have a DTMF decoder on
board.
      #    The VA3TO interface supports both ascii and
sound modes.
      #
      # In either linkMode(a or s), if CTS or DSR or CD
pin in the serial
      # port goes HIGH(ON), rtpDir will detect that and
assume it is
      # a COS signal and will start reading audio from
```

```
the sound card.
      # Of course, if rtpDir VOX checkbox is checked,
then rtpDir
      # will start reading audio from the sound card if
      # VOX level exceeds VOX threshold.
      #
      # If you do NOT have a radio link interface
connected to the PC or
      # you do NOT have a radio connected or
      # you do NOT have a serial port, then use a dash,
example linkMode=-
      # Only if you set linkMode to a or s, the serial
port
      #   will be opened.
      # If soundCard=no, serial port is not opened.
      linkMode=s

      # The serial port connected to a link interface
      # like VA3TO, Rigblaster, SignalLink,...
      # Whatever port you connect the interface to,
      # make sure the port is not locked by another
program.
      # For Windows: TXcomport=com2
      # For Linux:   TXcomport=/dev/ttyS1
      # Other values for Windows:
      #            com1,com3,com4,...
      # Other values for Linux:
      #    /dev/ttyS0, /dev/ttyS2, /dev/ttyS3,...
      TXcomport=/dev/ttyS1

      # Some radio/radio interfaces expect one of the
serial
      #   port pins to be inverted.
      # If that is the case, set one of them to yes.
      invertCD=no
      invertCTS=no
      invertDSR=no

      # Use the Internal(I) DTMF decoder in rtpDir.
      # or  the External(E) DTMF decoder on the radio
link interface.
```

```
      # or None(N)
      # If you have a VA3TO or WB2REM or G3VFP or G4CDY
radio
      #   link interface which has a DTMF decoder on
board,
      #   set dtmfConfig=E  if you like.
      #
      # dtmfConfig=I
      # dtmfConfig=N
      dtmfConfig=E

      # Do you want to be notified with voice response
      # over the local RF link?
      # The following voice responses are used:
      # "busy", "notbusy", "connected", "disconnected",
      # "not found", "enabled", "disabled", "connecting
to",
      # "Conference", "repeater", "link", "already in
conference",
      # "access denied", "time-out", "Error",...
      # These voice messages are in files with
extension .gsm
      # You can test how it sounds, by playing back the
      # .gsm file with playgsm, if rtpDir is not
running.
      # Example:  ./playgsm  notfound.gsm
      # Or you can play it back with Menu option
Control/PlayBack.
      # If you want to record your own gsm file so that
      # your own voice is played back instead of the
      # electronic-computerized voice, then start
rtpDir,
      # do not connect to any station, check REC
checkbox,
      # check PTT checkbox and speak into the MIC.
      # When you are done, uncheck REC and PTT.
      # Look for a file rtpDir_recorded.gsm
      # Use Menu option Control/PlayBack to play it
back or
      # shutdown rtpDir and playback that file
      # with playgsm. If it sounds OK to you,
```

```
      # rename that file to match one of the
      # gsm files included in the package.
      # So, if you spoke the words "NOT FOUND"
      # into the MIC, rename that file to notfound.gsm
      # You can do that with all the voice gsm files.
      # yes or no
      #
      playMsg=yes

      # During playback, play for how long(in seconds)
before a pause?
      # If playDuration is set to 0, then playback will
NOT be interrupted.
      playDuration=120

      # During playback, pause for how many seconds,
before continuing?
      playPause=5

      # announce connects/disconnects for Asterisk.
      # if set to no, rtpDir will NOT announce its own
message
      #    when the Asterisk station connects directly
to rtpDir
      #    but still the your Asterisk station will
genereate its own
      #    announcement.
      playMsgAST=no

      # announce connects/disconnects for IRLP
      # if set to no, rtpDir will not announce its own
message
      #    when the IRLP station connects directly to
rtpDir
      #    but still your IRLP node station will
generate its own
      #    announcement.
      playMsgIRLP=no

      # Announce the connected CALLSIGN over the local
RF link?
```

```
      # There are gsm files, A.gsm thru Z.gsm and
      # 0.gsm to 9.gsm to support the announcement of
      # CALLSIGNs over the local RF link.
      # If soundcard=no, the CALLSIGN is not announced.
      # However if soundCard=no because you are running
rtpDir
      #    in "Echolink + IRLP" mode, and the IRLP user
      #    on the IRLP radio requested to connect to an
      #    Echolink node, then announcement of the
CALLSIGN
      #    will be trasmitted into the local IRLP
ISPEAKER
      #    software so the IRLP user on the IRLP radio
      #    will know who connected.
      # yes or no
      playCall=yes

      # ID your station over local RF link
      # every so often, in minutes.
      # If it is 0(zero), no station identification is
done.
      #
      # You have 2 choices here:
      # Either use rtpDir and record your own gsm file
      # and rename it to id.gsm or
      # use cwgsm program to create a CW morse code
file
      # and rename the resulting file from cwid.gsm
      # to id.gsm
      # The station is identified
      # only when local RF link and rtpDir are quiet.
      #
      # The file id.gsm is played back.
      IDinter=0

      # Delay in seconds before transmitting
      # the file welcome.txt to the connected station
      # See option sendWel
      # Dont set it near 0, connected stations
      # have a "feature" that clears the text
      # in the chat text window when a connection is
```

```
made.
      # rtpDir will not clear any text in the chat text
window.
      # welcomeTxtDelay in seconds.
      # welcomeTxtDelay=13

      # Allow the welcome.txt file to be trasnmitted?
      # The file welcome.txt must exist
      # in the QSOdir
      # Keep the text inside the file welcome.txt
      # to less than 512 characters and all
      # of the text in one single line.
      # It will be sent in one burst.
      # Also see option welcomeTxtDelay
      # yes or no
      sendWel=yes

      # Similar to welcomeTxtDelay option
      # but refers to welcome audio.
      # See option playWel
      welcomeAudioDelay=13

      # Allow the welcome.gsm file to be transmitted?
      # yes or no
      playWel=yes

      # Important:
      # If you're running a BRIDGE, set the above
variables
      # to no:  playWel, sendWel
      # and set IDinter=0

      # delay in playing announcements, callsigns, and
      #   welcome audio to users.
      # Measured in milliseconds.
      # If it is set to 0, then no delay is applied.
      playfile_delay=20


      # VERY IMPORTANT
      # ==============
```

```
      # The above options: playMsg, playCall, IDinter,
playWel
      # use "BLOCKING" functions to play audio.
      # It has to be "BLOCKING" so that the entire
message
      # gets played in its entirety with no break-ups
in between.
      # DO NOT CREATE 100MB audio file to contain just
the
      # voice response "CONNECTED". In other words, the
audio file connected.gsm
      # should be small size and to the point. If it
takes more than the
      # RTCPtimeout to finish playing the voice
response "CONNECTED"
      # connected stations to your station may get
disconnected.
      # Example: If your RTCPtimeout value is 5, so in
this case
      # case the real timeout is 50 seconds(5 * 10),
then
      # the audio message contained in the file
connected.gsm
      # should take no more than 50 seconds to play
out.
      # The menu option Control/Playback can play any
size audio file
      # you want. There are no restrictions on Control/
PlayBack menu option.

      # Configurable DTMF commands.
      # These are dtmfs that can be sent from the
Echolink radio only
      #    and only if soundCard=yes
      # To send dtmfs from the IRLP radio, consult the
file
      #    /home/irlp/custom/custom_decode
      # To send dtmfs from the Asterisk radio, look for
teh variable ast_dtmf_cmd
      # All dtmf commands start with a 2-digit code.
      # DTMF commands are converted to uppercase
```

```
      # when rtpDir processes the configuration file,
      # so a1 is the same as A1
      # Any commands that you dont want rtpDir
      # to process, replace with invalid dtmf
      # Example:  dtmfShutdown=zz or dtmfShutdown=ZZ
which means you will
      #           never be able to shut it down
      # Use DISTINCT values for DTMF commands.
      # WARNING: Results are UNDEFINED if dtmf
      #          commands are NOT UNIQUE.
      # If soundCard=no, rtpDir will not receive any
Echolink dtmfs.
      # dtmfs from the IRLP radio are converted to text
commands which
      #   are received by the rtpDir bridge.

      # Enable and disable the Echolink part of the
rtpDir bridge.
      dtmfEnable=01
      dtmfDisable=02

      # Disconnect the station that is on top.
      # The station that is on top is reported by
dtmfWhoIsOnTop
      dtmfDisconLast=03

      # Disconnect a station by Callsign.
      # Follow instructions for dtmfConCall
      dtmfDisconCall=04

      # Disconnect all stations
      dtmfDisconAll=05

      # Report who connected last or who is active in a
QSO
      dtmfWhoIsOnTop=06

      # Set station to Busy.
      dtmfBusy=07

      # Shutdown rtpDir bridge
```

```
      dtmfShutdown=08

      # Report status. Connected, busy, not busy
      dtmfStatus=09

      # Enable detection of simple conference loops.
      dtmfDetectLoops=10

      # Any stations that connect are muted.
      dtmfNSM=11

      # Any stations that connect are marked as DEAF.
      dtmfNSD=12

      # dtmf command to set Bridge audio on/off
      dtmfBrv=13

      # dtmf commands for random connects to
conferences,
      # repeaters, links and PC users.
      dtmfRndConConf=14
      dtmfRndConRptr=15
      dtmfRndConLink=16
      dtmfRndConPCusr=17

      # dtmf command to abort a connection timer in
progress.
      # Aborting the connection timer, allows you to
make
      # another connection.
      # Same as Control/Abort_Connect_EL menu option
      # Connect requests to IRLP stations can not be
aborted.
      dtmfConAbort=20

      # start/stop recording
      dtmfRec=21

      # start/stop playback
      dtmfPlay=22
```

```
      # Identify your station as a CONFerence
      dtmfCnfo=23

      # Tutn off the CONF identfication
      dtmfCnff=24

      # dtmf to connect to irlp
      # Example: 259990 will try to connect to IRLP
node 9990
      dtmfcirlp=25

      # dtmf to disconnect from irlp
      dtmfdirlp=26

      # Control your Asterisk nodes thru rtpDir
Echolink dtmf tones.
      # There are at least 100 commands or so that can
be sent to Asterisk.
      # Consult the Asterisk documentation.
      # Asterisk server must be running local to
rtpDir.
      # dtmfAstCmd=27 and that means that anything else
after 27
      #    is passed to the Asterisk server for
processing.
      #   Enter dtmf 27 and follow it with the asterisk
dtmf tones
      # example: 27*7     will announce connected
Asterisk nodes
      # example: 27*12000 will drop node 2000
      # example: 27*32000 will connect to Asterisk node
2000
      # Anything after 27 is passed directly to the
Asterisk server.
      # rtpDir will only have one Asterisk connection
on the screen,
      #   all other Asterisk connections are linked to
your
      #   asterisk rtpdir driver node.
      # The config variable astKickall,(see below) is
special
```

```
      #    because it does not care if the Asterisk
server runs local to rtpDir or not.
      #    It will force rtpDir to stop interfacing
with asterisk.
      # Assuming that you have set astKickall=*95 in
this file, read this example
      # example: 27*95   will kick out all asterisk
nodes connected to your driver node
      #                       only if you have enabled
*95 in asterisk rpt.conf,
      #                       and only if the asterisk
server runs local to rtpDir,
      #                       but even if you have not
enabled *95 in Asterisk,
      #                       and even if asterisk is
not local to rtpDir,
      #                       rtpDir will stop
interfacing with Asterisk.
      #                       Any other command, will
cause rtpDir to start interfacing
      #                       with asterisk again.
      #
      # Anything after 27 is passed directly to the
Asterisk server.
      # rtpDir will only have one Asterisk connection
on the screen,
      #   all other Asterisk connections are linked to
your
      #   asterisk rtpdir driver node.
      #   Your asterisk driver node is the asterisk
node listed in asterisk rpt.conf
      #    having rxchannel=rtpdir/0.0.0.0:4570:4670
      #    and also given by the configuration variable
astNode in this file.

      dtmfAstCmd=27

      # Control your dstar node with Echolink dtmf
tones.
      # dtmfDstarCmd=28
      #   Enter first dtmf 28 and then an index number.
```

```
      #        The index number you enter points to the
an entry in the file dstar5198.txt
      # Each Dstar connect command disconnects first
from the currently
      #   connected dstar node and re-connects to a new
one.
      # Only one D-star connection is allowed at a
time.
      # Example: 281 will connect you to the 1st dstar
node in the file dstar5198.txt
      # Example: 282 will connect you to the 2nd dstar
node in the file dstar5198.txt
      #
      # Example: special case: 280 will disconnect from
the dstar node
      #              if a dstar node is connected to
your station.
      dtmfDstarCmd=28

      # disconnect an Echolink node by its node numbe
      dtmfdnode=29

      # Enable IRLP
      dtmfIRLPon=30

      # Disable IRLP
      dtmfIRLPoff=31

      # Mark and unmark a station "DEAF".
      dtmfDeafDstar=32
      dtmfUndeafDstar=33

      # script command that makes a connect call to an
IRLP node
      # This is used by the rtpDir bridge gui only.
      conIRLPnode=/home/irlp/scripts/
rtpDir_IRLP_callstn.sh

      # script command that makes a connect call to an
IRLP reflector refXXXX
      # This is used by the rtpDir bridge gui only.
```

```
      conIRLPref=/home/irlp/scripts/
rtpDir_IRLP_callref.sh

      # script command that makes a connect call to an
IRLP reflector expXXXX
      # This is used by the rtpDir bridge gui only.
      conIRLPexp=/home/irlp/scripts/
rtpDir_IRLP_callexp.sh

      # script command that disconnects the IRLP
connection.
      # This is used by the rtpDir bridge gui only.
      disconIRLP=/home/irlp/scripts/
rtpDir_IRLP_endcall.sh

      # dtmf connect requests to stations
      # using shortcuts. This is for Echolink only.
      # Multiple dtmfConShort commands are allowed,
      # but the prefix must be unique among them,
      # and the prefix must be unique between all
      # dtmf commands.
      # The syntax of this command is a 2-digit dtmf
code(the prefix)
      # plus the node# to connect to.
      # If the received dtmf sequence matches one
      # of the prefixes, a connect request to
      # that node will be initiated.
      # Looking at the example below,
      # if the dtmf sequence 30 is received
      # the software will connect to nodeNumber 99999
      # Just make sure that you're not using the codes
      # 30 or 40 or 50 in any other dtmf command.
      dtmfConShort=3099999
      dtmfConShort=4099999
      dtmfConShort=50327495

      #
      # Command to connect by CALLSIGN, and follow it
by DTMF digits that
      #    represent CALLSIGN letters.
      # For any digit use that digit plus a 0,
```

```
      # example:
      #    for 4, use 40
      #    for 2, use 20,
      #    and so on...
      # For a letter use the numeric keypad plus
position of that letter
      #    under that key.
      # example:
      #    for letter A, use 21,
      #    for letter K, use 52,
      #    for letter N, use 62,
      #    for letter W, use 91   and so on...
      #    for * use *
      #    for - use #
      #
      #dtmfConCall=##
      dtmfConCall=61

      # Connect by Node
      #dtmfConNode=**
      dtmfConNode=62

      # Transmit delay in MILLISECONDS
      # How long before rtpDir assumes that
      # you have stopped trasmitting to the remote
station,
      # or you have stopped entering a dtmf sequence.
      # If you see that your dtmfs are cut short,
increase it and re-try.
      # This is also VOX delay, hangup time.
      # 1000 milliseconds is one second.
      txDelay=1000

      # Receive delay in SECONDS.
      # How long before rtpDir assumes
      # that the remote station has stopped talking.
      # If value is not between 1 and 10, it will be
set to 1.
      rxDelay=1

      # Maximum transmit time for stations, in seconds.
```

```
      # This is the QSO timeout.
      # This is to prevent stations from monopolizing
the conference.
      # Set it to 0 to disable.
      # If not 0 and station transmission time exceeds
this value,
      #   a text message will be sent to the station
      #   and the station will be disconnected.
      # This is for Echolink stations only.
      # IRLP stations have their own timeouts.
      maxTXtime=120

      # Show connected station in QTH(yes,no)
      # If yes, the list shows who you're
      # connected to, otherwise
      # it only shows your QTH.
      # Makes no difference if running a conference.
      stnInQTH=no

      # connect to this station on start up
      # This is for Echolink stations only
      # Use a single dash -  for no connections on
start-up,
      # or use a CALLSIGN, example:
onStartUp=*ECHOTEST*
      onStartUp=-

      # event notification
      # start-up, shutdown, connected and disconnected
event
      #   notification.
      # A simple script evt.sh for Linux and evt.bat
for DOS
      # is included. You can transmit these events
anywhere,
      # even update a web site.
      events=no
      #eventpgm=/root/rtpDir/evt.sh
      eventpgm=C:/rtpDir/evt.bat

      # Report connect and disconnect activity
```

```
      #   to other stations?
      # yes or no
      reportAct=yes

      # Maximum duplicate message count.
      # If maxDups=0, then the duplicate detect logic
      #    is disabled.
      # If maxDups is greater than zero and
      #    the connected station passes duplicate
      #    text messages that exceed this maximum, then
      #    the connected station will be disconnected.
      #    This is to prevent looping of text messages,
      #    since the RTP protocol uses
      #    a detection logic on UDP/audio messages
only,
      #    but not on text messages which have no
sequence
      #    numbers.
      # This is also true for administrators. Dont keep
      #    keep sending the same command over and over.
      # If the remote text command exceeds this limit,
      #    even the administrator will be disconnected.
      #    RTP/Sanity-Stats menu option will report
duplicate counts.
      maxDups=125

      # Display station info for each
      #   of the connected stations on screen.
      # This should be set to 0 when running as a
      #   Bridge conference.
      # If not a Bridge conference,
      #   try to keep this to a small number.
      # Example: keep station info in memory for
      #    the last 2 active stations.
      maxNumSInfo=2

      # responsiveness of the audio strength bar
indicator
      # Valid values are 0,1,2,3
      # a value of 3 is the least responsive
      barDelay=3
```

```
      # detect simple conference loops
      detectConfLoops=yes

      # reply port for remote text commands for
scripting.
      # This reply port MUST NOT be equal to port.
      # So if port was set to 5198, then
txtCmdReplyPort
      # MUST NOT BE 5198 and MUST NOT BE 5199
      # and MUST NOT BE port 5200.
      # and it MUST NOT BE  ANY IRLP
PORT(2074...2093,15425...15428)
      txtCmdReplyPort=6500

      # Accept IRLP connections, yes or no
      irlpEnable=no

      # Your IRLP IP address
      # see also myIP for possible errors.
      myIRLP_IP=0.0.0.0

      # IRLP connections on these ports.
      # Both irlpPort and (irlpPort + 1) will be opened
for receiving.
      # irlpPort for audio and irlpPort + 1 for
control.
      # irlpPort and (irlpPort + 1) is also used for
transmitting.
      irlpPort=2074

      # If you have not installed IRLP, set it to no.
      # If you are running rtpDir on Windows, set it to
no.
      # If you're interested in running a
      # pure IRLP reflector, set it to no.
      # The only time you will set accessIRLP=yes is
when
      # you have installed and running an IRLP node
stnXXXX.
      #
```

```
      accessIRLP=no

      # Your IRLP node.
      # If you have installed IRLP and irlpEnable=yes
      # set irlpNode to your assigned IRLP node.
      # If you have not installed IRLP,
      # or irlpEnable=no , set it to stn0000
      # If you are running rtpDir on Windows, set it to
stn0000
      # MUST BE in lowercase.
      #irlpNode=ref9990
      irlpNode=stn0000

      # This will be the UDP port for the local IRLP
ispeaker binary.
      # Must be even number and different from
irlpPort.
      # localISPEAKERport=2174

      # Do you want to accept *Asterisk* node connects.
      #   yes or no
      astEnable=yes

      # What is the Asterisk command that disconnects
all
      #   Asterisk nodes connected to your Asterisk
node?
      #   The default is *95 but you will have to
enable that
      #   in the asterisk rtp.conf file
      astKickall=*95

      # asterisk binary
      # If you use Asterisk, you must start it in
server mode.
      astBinCmd=/usr/sbin/asterisk

      # This is the Asterisk node in /etc/asterisk/
rpt.conf
      #    that runs the rtpdir channel driver in
Asterisk
```

```
      #    The rtpdir channel driver node in rpt.conf
      #      must have this:    rxchannel=rtpdir/
127.0.0.1:4570:4670
      # It is related to allowAST variable, see below.
      astNode=2167

      # Your IP address for accepting Asterisk messages
     myAST_IP=0.0.0.0

     # rtpDir will accept Asterisk messages on this
local port
     localASTport=4570

     # The *Asterisk* node port on the remote machine
     #   or the local machine.
     remoteASTport=4670

     # The IP address of where the Asterisk server is
running that
     #    also has the chan_rtpdir channel driver
active.
     allowAST=127.0.0.1

     # Asterisk DTMF tone translation table
     # These lines map Asterisk dtmf tones to rtpDir
commands that will
     #    be sent from the Asterisk radio/HT to rtpDir
for processing
     #      to connect/disconnect Echolink, IRLP and
dstar nodes.
     # Example:
     #
     #    The asterisk radio user on the radio/HT
punches this
     #      dtmf sequence: *4<driver node><rtpDir
command>#

     #        where *4 forces the driver node to go
     #            into command mode and the pound sign
at the end
     #            of the sequence completes the
```

```
sequence.

     #    You will enter the above dtmf sequence from
the Asterisk radio node
     #       and direct it to the driver node rtpdir
channel driver.
     #
     #    The radio node is identified by a node in
rtp.conf that
     #      has this:  rxchannel=Radio/usb
     #
     #    The driver node is identified in rpt.conf by
a node that has this:
     #         rxchannel=rtpdir/0.0.0.0:4570:4670
     #
     #    The <rtpDir command> is explained here:
     #    Example of an <rtpDir command>  is 059990A
     #    This works as follows:
     #    rtpDir will take 05 to be a command to
connect to an IRLP reflector,
     #   the IRLP reflector is 9990 and the last dtmf A
will be dropped because
     #   it flags the end of the dtmf sequence.

     #   Each <rtpDir command> starts with a 2-digit
number given by ast_dtmf_cmd
     #   Multiple assignments are allowed for
ast_dtmf_cmd
     #
     #   Make sure the 2-digit ast_dtmf_cmd is unique
among all of them.
     #   You must have 2 Asterisk nodes for this to
work.
     #   One node will be the radio node and will have
     #              rxchannel = Radio/usb
     #   and the second node will be the rtpdir driver
node with
     #              rxchannel = rtpdir/
0.0.0.0:4570:4670
     #   To send dtmf commands from your Asterisk radio
node to the driver node,
```

```
     #         you will send this as a dtmf sequence:
*4<driver node><rtpDir command>#
     #         where <rtpDir command> is something like
059990A as explained above.
     #   You can do the same thing from the Asterisk
CLI command prompt.
     #   Lets say the Asterisk radio node is 2184 and
the driver node is 2167
     #   The CLI command would be this:   rpt fun 2184
*42167<rtpDir command>#
     #   Example: to connect to the Echolink node 9999:
rpt fun 2184 *42167019999A#

     # connect to an Echolink node
     # Example: 019999A will connect to *ECHOTEST*
which is node 9999
     ast_dtmf_cmd=.cnode  01

     # disconnect from an Echolink node
     # Example: 029999A  will disconnect Echolink node
9999
     ast_dtmf_cmd=.dnode  02

     # connect to an IRLP station(not for IRLP
reflectors)
     # Example: 033249A  will connect to irlp node 3249
     ast_dtmf_cmd=.cstn   03

     # disconnect from an IRLP station(not for IRLP
reflectors)
     ast_dtmf_cmd=.dstn   04

     # connect to an IRLP reflector
     # Example: 059990A that will connect to irlp
reflector 9990
     ast_dtmf_cmd=.cref   05

     # disconnect from an IRLP reflector
     ast_dtmf_cmd=.dref   06

     # shutdown rtpDir bridge
```

```
     ast_dtmf_cmd=.shutdown 09

     # disconnect all Echolink nodes
     ast_dtmf_cmd=.del 10

     #disconnect all IRLP nodes
     ast_dtmf_cmd=.dirlp 11

     # disconnect all nodes
     ast_dtmf_cmd=.dall 12

     # start/stop recording
     # Record all audio packets from all
sources(Asterisk,IRLP,Echolink) into
rtpDir_recorded.gsm
     # The recording command is somewhat dangerous.
     # Asterisk is not using a hardware-based DTMF
decoder and it may miss a dtmf digit
     #   when you are trying to turn off recording.
     # It is beter to have an external script that runs
at certain times during the
     #    day and at a specific time, that script would
send the record command to rtpDir
     #    bridge to start/stop recording.
     # So uncoment out this line only if you understand
the implications of it.
     # Anyway, a message that the rtpDir bridge is
recording will be sent the
     #   the radio user(both IRLP and the Asterisk
user) to notify when the
     #   the recording started and when it ended.
     #   The audio message that rtpDir sends to the
radio user to tell them
     #      that recording mode is on/off is contained
in the files recon.gsm and recoff.gsm
     #      Asterisk will also transmit the "audio
command" message to the radio user,
     #      so make sure that recon.gsm and recoff.gsm
contain different audio mesages
     #      from the Asterisk audio messages.
     #
```

```
     #      recon.gsm or recoff.gsm will only be
transmitted to the local RF IRLP node
     #      and the asterisk node identified by the
astNode configuration variable.
     #      (If other asterisk nodes are connected
under that astNode then asterisk will
     #       send the message to those nodes also.)
     #
     # ast_dtmf_cmd=.record 13

     # start/stop playback
     # Playback the file rtpDir_recorded.gsm to all
connected nodes(Asterisk, IRLP, Echolink).
     ast_dtmf_cmd=.play 14

     # report nodes directly connected to rtpDir/
rtpDir_tm.
     ast_dtmf_cmd=.conx 15

     # Identify your station as a CONFerence
     ast_dtmf_cmd=.cnfo 16

     # remove the CONFerence identification from your
station
     ast_dtmf_cmd=.cnff 17

     # connect/disconnect to a dstar node
     # 180 will disconnect
     # 181 will disconnect first and then
     #       connect to the first dstar node in the
file dstar5198.txt
     # 182 will disconnect first and then
     #       connect to the second dstar node in the
file dstar5198.txt
     #    and so on 183 184 185 ...
     #
     # So lets say the second entry in the file
dstar5198.txt is XRF010 xrf010.xreflector.net
     #
     # To connect to reflector XRF010, you would  enter
the following dtmf
```

```
     #    sequence on the Asterisk radio HT and
assuming your driver node is 2167
     #                         *42167182A#
     #  Again, lets analyze it:
     #                         *4 to enter command mode,
     #                         2167 is the asterisk
chan_rtpdir channel driver node
     #                         182A is a request to
connect to the second entry in the file dstar5198.txt
     #                         The pound sign at the end
completes the sequence.
     #
     ast_dtmf_cmd=.dstar 18

     # Enable IRLP
     ast_dtmf_cmd=.irlpon  19

     # Disable IRLP
     ast_dtmf_cmd=.irlpoff 20

     # Disable non-IRLP part of rtpDir
     ast_dtmf_cmd=.disable 21

     # Enable non-IRLP part of rtpDiR
     ast_dtmf_cmd=.enable 22

     # deaf the dstar connection
     ast_dtmf_cmd=.dstarDeaf 23

     # un-deaf the dstar connection
     ast_dtmf_cmd=.dstarUndeaf 24

     # This is a single DTMF and it means that when the
user
     #   sends this dtmf tone, whatever dtmf tones
rtpDir has accumulated
     #   in its buffer will be processed
     ast_dtmf_end=A

     # DSTAR insteface starts here
     #
```

```
     # Enable the DSTAR interface
     dstarEnable=yes

     # When a dstar node is connected, should it be
marked as "DEAF"?
     dstarIsDeaf=yes

     # Better leave this alone at 0.0.0.0
     myDSTAR_IP=0.0.0.0

     # rtpDir will be receiving DSTAR messages on this
local udp port
     # consult the dextra_client package package for
correct value.
     localDSTARport=7770

     # rtpDir will be sending to DSTAR on this remote
udp port
     # consult the dextra_client package for correct
value.
     remoteDSTARport=9990

     # Only one line for DSTAR
     # This is the IP address where the dextra_client
software software is running.
     allowDSTAR=127.0.0.1

     #
     # DSTAR interface ends here

VERY IMPORTANT:
==============
Add all your Echolink callsigns in uppercase, and all
your irlp nodes in lowercase
and all your Asterisk nodes in lowercase to the rtpDir
security file: adm5198.txt
Note: prepend the letters ast in front of the asterisk
node number.
Note: prepend the letters stn in front of the IRLP node
number.
```

For example:
On our systems, the adm5198.txt file contains these 4 lines:

KI4LKF-L
KI4LKF-R
KI4LKF
ast2167
ast2184
stn4201

If you dont add your callsigns, then some of the features of
rtpDir will not work correctly or you will not get correct
connections or no connections at all or remote access will not work
or the rtpDir admin functions will not work.

If you will run rtpDir GUI on Linux systems,
add the localshost display to the X authorization file.
Most Linux Desktops run KDE or GNOME desktop and start the
Xorg X11 server like this:

/usr/bin/Xorg :0 -br -audit 0 -auth /var/gdm/:0.Xauth -nolisten ...

The file you need to check is /var/gdm/:0.Xauth

Run this:
xauth -f /var/gdm/:0.Xauth and when you get the xauth prompt,
type "list" and press Enter.
If you see only this:

   #ffff##:0 MIT-MAGIC-COOKIE-1 someBigNumberHere

Then you need to add the localhost display also.
So, type this and press Enter

```
  add localhost:0 MIT-MAGIC-COOKIE-1
TheSameBigNumberHere

Note: TheSameBigNumberHere must be equal to
someBigNumberHere

Now type exit and press Enter.


**************************************************
**********
**************************************************
**********
SOME PORT RECOMMENDATIONS:
As you can see, there are many ports that can lead to
confusion.
We recommend the following port settings:

port = 5198 for Echolink or if not an Echolink network,
       choose an even number different from the rest of
the ports below.
irlpPort = 2074 for IRLP if you are running an IRLP
node and not an IRLP reflector.
        or an even number between 2074 to 2092 if
running an IRLP reflector.
localISPEAKERport = 2174 and must be an even number.
txtCmdReplyPort =  any port as long as it is not equal
to any of the ports above.
                   We recommend 6500

localASTport=4570 which is close to *Asterisk* IAX2
default port of 4569
remoteASTport=4670 which is far enough from
localASTport

This port is created by rtpDir to receive audio packets
from dextra_client
localDSTARport=7770

# This port is created by dextra_client software to
receive audio packets from rtpDir.
```

```
remoteDSTARport=9990
************************************************************
************************
************************************************************
************************

There are 4 configuration entries that have something
to do with the sound card,
   that require some explanation, insci, outsci,
LatencyIN and LatencyOUT.
   insci for INput Scound Card Index and
   outsci for OUTput Sound Card Index.

We have included a utility software in the package,
   called showcard that when you run it on a Linux
   machine, will output the following lines:
Sample output from showcard on a Linux machine that has
2 sound cards installed.
The first sound card has a name /dev/dsp and the second
sound card has a name /dev/dsp1
The name is always at the end of each line.

INFO:Sound card devices not in use on this machine
------------------------------------------------
SC Index 0: Rate=44100.000000, maxIn=16, maxOut=16,
Low(in:0.011610,out:0.011610), High(in:0.046440,out:
0.046440) : /dev/dsp
SC Index 1: Rate=44100.000000, maxIn=16, maxOut=16,
Low(in:0.011610,out:0.011610), High(in:0.046440,out:
0.046440) : /dev/dsp1
...
... Other lines are ommited because we dont care about
anything else that has a name that does NOT start
with /dev/dsp
...

Note: On Linux, showcard will only show the sound cards
that are NOT in use.
      On Windows, showcard.exe will show all the sound
cards, even the ones that are in use.
```

We only need to look for lines that have a name like /dev/dsp for the first sound card installed,
/dev/dsp1 for the second sound card installed and so on...
Dont care about any other line.

So, in linux we would set the following values in 5198.conf
The line above says that "SC Index 0:" identifies the first sound card which has the name /dev/dsp, so use value 0 for insci and outsci.

insci=0
outsci=0

If we wanted to use the second sound card, identified by "SC Index 1:" which has the name /dev/dsp1, we would set
insci=1
outsci=1

Now for LatencyIN and LatencyOUT, there are a couple of numbers inside the parenthesis.
For the sound card identified by /dev/dsp: The latency numbers are: Low(in:0.011610,out:0.011610) and High(in:0.046440,out:0.046440)

# use the Low values for latencyIN and LatencyOUT.
LatencyIN=0.011610
LatencyOUT=0.011610

You may also use the High values for latencyIN and LatencyOUT.
LatencyIN=0.046440
LatencyOUT=0.046440

On linux, the alsamixer software can be used to control the record and playback settings on the soundcard
or use the aumix software.
You may need to download the alsa-utils package.

For example: To configure the first sound card installed on Linux,
we could use the program alsamixer like this:

```
alsamixer -c 0
```

or

```
alsamixer -c 1
```

Parameter 0 identifies /dev/dsp which is the first sound card
and paramters 1 identifies /dev/dsp1 which is the second sound card

The alsamixer program is included in the package alsa-utils and it is a text-mode program.
For GUI programs that run on the Desktop, you could use the program system-config-soundcard
The program system-config-soundcard is included in the package system-config-soundcard
Of course, there are other packages that you can use to configure the sound card on Linux.
There is the program kmix which is one of the KDE desktop programs that
can help you configure your sound card.
kmix is included in the package kdemultimedia.

For Windows, things are a little different because insci and outsci are never equal to each other.
Here is sample output from program showcard.exe executed on a Windows machine.
Run showcard.exe from a DOS terminal window, showcard.exe is not a GUI application,
so its output scrolls off the screen very quickly if you try to execute it
from the Desktop amd you will not be able to see its results.

INFO:The following sound cards are installed on this PC

```
-------------------------------------------------------
-
SC 0: Rate=44100.000000,maxIn=2,maxOut=0, Low(in:
0.200000,out:0.200000), High(in:0.400000,out:
0.400000) :Microsoft Sound Mapper - Input
SC 1: Rate=44100.000000,maxIn=2,maxOut=0, Low(in:
0.200000,out:0.200000), High(in:0.400000,out:
0.400000) :Creative Sound Blaster PCI
SC 2: Rate=44100.000000,maxIn=2,maxOut=0, Low(in:
0.200000,out:0.200000), High(in:0.400000,out:
0.400000) :Xtreme Sound PCI Audio Device
SC 3: Rate=44100.000000,maxIn=0,maxOut=2, Low(in:
0.200000,out:0.200000), High(in:0.400000,out:
0.400000) :Microsoft Sound Mapper - Output
SC 4: Rate=44100.000000,maxIn=0,maxOut=2, Low(in:
0.200000,out:0.200000), High(in:0.400000,out:
0.400000) :Creative Sound Blaster PCI
SC 5: Rate=44100.000000,maxIn=0,maxOut=2, Low(in:
0.200000,out:0.200000), High(in:0.400000,out:
0.400000) :Xtreme Sound PCI Audio Device

To understand the above output, lets first forget
   the lines identified by "SC 0" and "SC 3". These are
mappers.
Mappers could also work. For example, looking at the
above list,
we could set
               insci=0
               outsci=3

because "SC 0:" is the Input mapper
and "SC 3:" is the output mapper.

but sometimes mappers dont work or we get errors when
using them.

So, we could also use these values:

insci=1
outsci=4
```

You will have to choose the insci and the outsci.
On the above system we chose insci=1 and outsci=4.
In other words, we chose "SB AudioPCI 64D Record" for insci
   and "SB AudioPCI 64D Playback" for outsci.
On your system, it could be insci=1 and outsci=5,
or insci=1 and outsci=3. In other words, the device name
used for input and the device name used for output must be identical.
You have to do the same analysis on your system.

For Latency values, you would use these settings:
LatencyIN=0.20
LatencyOUT=0.20

or you might use the high values
LatencyIN=0.40
LatencyOUT=0.40

NOTE: If running the software with soundcard=no
      then insci and outsci numbers are not
      checked by the rtpDir software,
      and rtpDir will not try to open the sound card.
      Also, rtpDir will NOT open the sound card
      if the callsign that you are using to run rtpDir
      starts with *

STARTING rtpDir on Windows.

This means you are running rtpDir as an Echolink link or repeater
or as a PC user station or as an Echolink conference
or as an IRLP reflector/Echolink conference.
soundCard config option can be yes or no
Open a DOS box.
Change to the directory where rtpDir is installed.
That directory is C:\rtpDir
Execute the following (Type on the keyboard and press ENTER):

rtpDir.exe 5198.conf 5198.log

rtpDir should initialize and appear on the screen
within 5 seconds.
If not, examine the contents of the file 5198.log using
NOTEPAD
fix the problem and re-try.

If it appears, you can go ahead and create a batch file
or a desktop icon or a shortcut.
A simple Windows/Dos batch file 5198.bat is supplied.
We recommend that you create a desktop icon on Windows
that
references the actual executable and pass it the
required 2 parameters
instead of creating a shortcut that refers to a
batch file.
A shortcut to a batch file on Windows will create that
ugly looking DOS box,
that sometimes it is difficult to get rid of.

STARTING rtpDir on Linux, IRLP is NOT installed
==========
This means you are running rtpDir as an Echolink link
or repeater
or as a PC user station or as an Echolink conference
or as an IRLP reflector/Echolink conference.
soundCard config option can be yes or no
Make sure user id is root.
Open a terminal window so you can type on the keyboard.
Go to the directory where rtpDir is installed. That
is /root/rtpDir

Study the comments in the 5198.sh script and comment
out
the lines sleep, ispeaker and imike, then

Type the following on the keyboard and press ENTER:

./5198.sh

rtpDir should initialize and appear on the screen
within 5 seconds.
If not, examine the contents of the file 5198.log using
vi or emacs
   editor, fix the problem and re-try.

For starting rtpDir_tm on Linux, read the file
rtpDir_tm.txt
posted on the yahoo group.

STARTING rtpDir on Linux, IRLP is installed
==========
NOTE: Some routers are configured to allow outbound
      connections only and block inbound connections.
      Make sure that your router allows inbound
connects,
      otherwise IRLP may report that the connection has
been
      established but the SDES request message will not
arrive
      to your station and therefore you will have a
"half-baked"
      connect which will not work in Echolink + IRLP
mode.
      The same is true for Echolink connects also.

This means you are running rtpDir in "Echolink + IRLP"
mode.
Make sure soundCard=no unless you have assigned
   one sound card(first/default sound card) for IRLP
and
   another sound card for rtpDir.
Make sure that you've installed IRLP under /home/irlp
directory.
We will assume that that you followed the steps in the
section
titled "Additional steps if you plan to run rtpDir in
Echolink + IRLP mode".
Make sure user id is root.
Open a terminal window so you can type on the keyboard.

Start the IRLP node FIRST.
Type the following from the keyboard and press ENTER:

/home/irlp/custom/rc.irlp

Start the rtpDir bridge LAST.
Go to the directory where rtpDir is installed. That is /root/rtpDir

Study the comments in the 5198.sh script and
   enable or disable the correct IRLP ports, then

Type the following on the keyboard and press ENTER:

./5198.sh

rtpDir should initialize and appear on the screen within 5 seconds.
If not, examine the contents of the file 5198.log using vi or emacs
   editor, fix the problem and re-try.

Also your local IRLP node will connect to the rtpDir bridge within
a few seconds, usually after the initial Echolink list has been downloaded.

Now a simple step to test "IRLP" node is required.
Login in to your Linux box, open a terminal window and change
to the directory /root/rtpDir where you have installed rtpDir bridge.
Type the following at the keyboard and press ENTER

./gsmfile2ispeaker itisarptr.gsm 2174

The 2174 port is the same port as the rtpDir config variable
localISPEAKERport is set to.(localISPEAKERport=2174)

If you did not get any sound on the IRLP radio,

something is wrong with the setup.

(You will not find gsmfile2ispeasker if you install rtpDir on Windows,
since IRLP does not run on Windows.)

The rtpDir config option playMsg must be yes(playMsg=yes)
if you want to listen to "CONNECTED" and "DISCONNECTED" messages
whenever a station(IRLP or Echolink) connects to your IRLP node.

The rtpDir config option playCall must be yes(playCall=yes)
if you want rtpDir to announce the callsign on your IRLP radio
whenever a station(IRLP or Echolink) connects to your node.

For starting rtpDir_tm on Linux, read the file rtpDir_tm.txt
posted on the yahoo group.

THINGS to NOTICE when running rtpDir/rtpDir bridge in "Echolink + IRLP" mode.
==========
--- You must first start the IRLP node before starting the rtpDir bridge.
--- Your local IRLP node will remain connected to the rtpDir bridge.
--- If you restart the IRLP node by executing the script /home/irlp/custom/rc.irlp
while rtpDir bridge is running, restart the rtpDir bridge also.
--- Operation of the rtpDir bridge has been tested only when user ID is root.
We have not tested rtpDir bridge with a non-root user ID.
DO NOT run rtpDir with the user ID of "repeater".

That user ID belongs to IRLP.

These GUI options apply to rtpDir(GUI) for both Linux and Windows.
Options for rtpDir(GUI) can be controlled from 5198.conf or the GUI menus.
rtpDir_tm has no GUI and all its options are in 5198_tm.conf

MENU OPTIONS
============
FILE:
  Shutdown: Shutdown the program.
             Dont stop the program with a
             system close command or
             kill command.
             System events are not caught.
             Shut it down with File/Shutdown menu option.
             File/Shutdown also saves callsigns
             into private,bookmark,banned
             and admin files.
             A File/Shutdown will also send the RTCP BYE
             message to all connected Echolink stations
             so they can do their own clean-up.
             It will also stop all active IRLP calls.
             However, there is a need sometimes
             to stop the program without using
             the File/Shutdown command. That is
             when you have stations connected
             and you want to make a change in the
             config file but without losing
             the connected stations. In that
             case, stop the program WITHOUT
             using the File/Shutdown menu option.
             Make the change in the config file
             and restart the software. The
             connected stations will automatically
             reconnect to your station.
             There is a time limit though.

You can not wait more that a certain
amount of time and expect the stations
to reconnect automatically.
IRLP starions do not reconnect.

LoginRefresh: Login(if not logged in),
and download station list.
Usually the Login and Refresh
timers do that for you,
but just in case you
want to do it yourself.
Also you have to do it
yourself if you disabled
the timers. See next 2 options.

Refresh Timer: How often to download the station list.
0 disables timer.

Login Timer: How often to login.
0 disables the timer.

SEARCH:
Exact searches are performed, except
with the option "Find Any(partial match)"
which loops thru all matched entries.

RTP:
Status: Shows if RX/TX thread is active.
Sanity-Stats: It displays a few checks in the log window
and also displays the stats. Stats
are reset according to RFC 3550 and 3551.
Stats for IRLP nodes are not included.
Packet loss figures are reported
per station connected to your station
if that station complies with the RTP
protocol. Some stations dont comply
and you will not get all the figures.
Dont execute this option often

when you're receiving or transmitting.
Output from stats is as follows, just an example
of both IRLP and Echolink stations connected:

```
062708 at 22:55:22:===== START OF Sanity-Stats ======
062708 at 22:55:22:[gui:->IP_address,stn3249,IRLP]
062708 at 22:55:22:[gui:IP_address,*NO3YNET*,
(Conference [6/8])]
062708 at 22:55:22:[gui:IP_address,ast2167,Asterisk
062708 at 22:55:22:-----------------------------------
062708 at 22:55:22:*NO3YNET*(IP
address),R=node1,L=node2,not muted,not deaf,GSM,E,0
062708 at 22:55:22:SR Packet count=190942
062708 at 22:55:22:SR Byte count=25204344
062708 at 22:55:22:RR Packets lost=0
062708 at 22:55:22:-----------------------------------
062708 at 22:55:22:stn3249(IP address),not muted,not
deaf,ADPCM,I,0
062708 at 22:55:22:ast2167(IP address),not muted,not
deaf,LINEAR,A,0
062708 at 22:55:22:===== END OF Sanity-Stats ======
```

Some notes on stats:
   There are two parts to it, the GUI section and the VoIP section.

   The GUI section

   Each entry under the GUI section has an IP address, callsign and station name.
   If you see an arrow just before the IP address
      then that station is transmitting.

   The VoIP section

   The VoIP section contains a little more info on the connected nodes.
   node1 is the Echolink node number for the remote(R) station.
   node2 is the Echolink node number for the local(L) station.

For IRLP stations the node number is in the callsign.
For Asterisk stations the node number is in the callsign.
It will show if station is muted or marked as deaf.
GSM, ADPCM, LINEAR is the codec being used by that station.
The number at the end of each line is the duplicate text message count.
E is for an Echolink node, I is for an IRLP node, A is for an Asterisk node.
SR is the Sender's Report. (from RFC3550, for Echolink nodes only)
RR is the Receiver's report. (from RFC3550, for Echolink nodes only)

Same information is generated by the remote text command .stats

CONTROL:
Here you connect, disconnect stations
mute, unmute, ban and mark stations as deaf.
Muting a station drops the audio
packets at the UDP/IP level.
If Audio checkbox is not checked
it will mute your sound card, but does not drop
incoming audio packets.
The Abort_Connect_EL option will abort a connection timer
in progress for Echolink stations only.
You can NOT abort connect requests made to IRLP stations.
There is always a chance and a very good one that
the remote station will receive the connect request and may
connect to your station after you abort the connect timer.
In either case, you can initiate
connections to other stations without waiting for
conxTimeout to expire. There is a side-effect to aborting

a connection timer in progress. A connect request may arrive from that
station later but it will not be known if your station initiated
the connect request or not,
so the welcome text message or welcome audio message may or may not
be transmitted depending on your station initiating other connections
since you aborted that first connection timer.
Chat text from a muted station is not blocked.
Chat text to a deaf station is not blocked.
Marking a station as deaf, will disallow transmitting
audio to that station. It is useful if you
want to transmit to certain stations only.
The PlayBack option will open up a pop-up window
and allow you to select an audio(*.gsm) file to be selected
for playback or testing. *Asterisk* gsm sound files can also
be played. These are located in /var/lib/asterisk/sounds and have
a gsm extension.
When you make your selection and click OK, the gsm audio file
will immediately start playing to the sound card if
no audio is being received from connected stations.
Audio will also be transmitted to the local Echolink RF node
and it will key up the Echolink radio.
While the audio is being played to the sound card, it will also be
transmitted to the connected stations including your local IRLP node,
all IRLP connections and all Asterisk connections.
If while you're playing back, audio is being received by a
connected station, then playback will be suspended.
It is a good idea to mute all conencted stations so that

the playback continues without interruption.
This is usually done when you are playing back ARRL news
or NASA news.

Connect_EL will connect to Echolink stations.
If accessIRLP=yes,
Connect_IRLPstn will connect to IRLP stnXXXX stations.
Connect_IRLPref will connect to IRLP refXXX reflectors.
If accessIRLP=no,
the Connect_IRLPstn and Connect_IRLPref menu options are disabled.
Make sure that /home/irlp/custom/environment file uses GSM, ADPCM or UNCOMP codec.

You can disconnect the Asterisk nodes directly connected to the asterisk driver node.
For this reason, the Control/AsteriskCmd menu option was added.

To connect/disconnect to/from D-star nodes, the menu option Control/DstarCmd was added.

BOOKMARKS,PRIVATE,BANNED:
Here you add stations to specific
lists.
A boomark callsign is displayed
only when station is logged on.
You should not add a bogus callsign.
Banned/AllowCallsByPrefix will allow
only callsigns having a specific "prefix".
Use that for country selection.

Admin:
Add admin callsigns and save them.
New Name and New QTH will allow
a new name and/or a new QTH to be
set while program is running.
The New Name update is done

immediately but the New QTH
update is done at the next login.

HELP:
Server msg is the last message
received from the server when
you did a full compressed download.
Login msgs are messages
generated while attempting to
do Login and/or differential compressed downloads.

CHECKBOXES(bottom of screen, on the left)
==========
Audio:
Check it to mute sound card,
Uncheck it to unmute sound card

LO: Listen Only.
Marks your station as "Listen Only" on the connected
station info list.
How quickly you see [listen only] next to your
callsign is up to the remote node.
Usually when station Info/Conference info text
is updated.

bp: Sounds off the PC's speaker on rcvd text.
It sounds weak on Windows.

stamp: Adds timestamp to received text.
Timestamp is blocked on outgoing messages.

trc: Trace.
Enables info/errors to be written into the log file.

NSM:
(N)ew (S)tations are (M)uted.
Audio packets from muted stations are dropped.
Useful while broadcasting ARRL news or ISS news.

TX/RX: tx/rx indicators.

-R: Allow repeater connects.

siRX: Station Info Receive.
      Allow the connected station's info to be
received.
      Uncheck it when you run it as a CONFERENCE.

BA: Bridge Audio.
    Enables the audio built-in bridge.
    If checked, any incoming audio
    from any station connected to you
    will be re-transmitted to
    all the other non-deaf stations connected to you.
    If not checked, incoming audio
    is not retransmitted to other stations.
    When you transmit, it does not matter
    if it is checked or not checked.
    Your audio will be transmitted to all
    non-deaf stations connected to you.

BT: Bridge Text.
    Same as "BA" but it refers to text
    messages only.

DL: It detects simple conference loops
    and it will mark the offending station(s)
    as deaf and mute.

NSD:
    (N)ew (S)tations are marked as (D)eaf.
    Stations marked this way will not receive
    any audio.

PTT: Check it once to TX, uncheck it to RX

-L: Allow Link connects

busy: Mark your station BUSY.
      Your station will be marked BUSY on

the next login.

siQTH: Display Station In QTH.
If NOT checked, it keeps the node you are connected to, private.
If checked, then your QTH is set to "In Conference ..." when you are connected to a node.
It has no meaning when running in CONFERENCE mode.

prv: Private.
Only stations listed in Private list are allowed to connect to you.

CNF: If checked, then your station is identified as a CONFerence to other stations.
Some remote conferences will not allow you to connect to them if you are a conference yourself.
In that case, uncheck CNF, wait 10 seconds and reconnect.
If not checked, some Echolink stations replace the callsign of the original trasmitting station with the callsign of the connected station in the text chat box.
In most cases, leave CNF unchecked.

VOX: Operate the software using vox, instead of PTT.
Also used to notify the software when audio arrived at the sound IN jack of the sound card. It works with the vox threshold.

"Blue Bar": audio strength indicator.

REC: Record QSO's
The generated file contains compressed(GSM) audio data, and no GSM header.

The program "playgsm" can playback the file.

"slider": Sets a threshold for vox.

The 4 Windows on the right of the screen:
==========
Top left: Connected stations to your station

Top right: The remote station's Information
for each connected station.
IRLP or Asterisk nodes do not
send any station information.
rtpDir has no control over that
and does not save this info
to a file. You can copy/paste it
if you like.
Some stations transmit this info
during a QSO or every so often.
You can stop it from coming in
by unchecking the siRX checkbox.
The station info changes
when new station info is received.

Middle: Screen log.
If Trace is enabled, the screen
log is saved to the log file.

Bottom: TX/RX received chat text.
Just below that: user text for
transmission.

REMOTE COMMANDS FOR ADMIN CALLSIGNS
==========
To control the bridge remotely, certain text commands
can be executed against the bridge.
There are 2 ways to do this:

The easy way:

Add the admin callsign to rtpDir bridge using Admin/Add

menu option. Only the admin callsigns are allowed
to execute remote text commands.
Connect another rtpDir software or the
the Echolink software to rtpDir bridge
as an admin callsign.
Now type a command in the text chat window.
The command must be given in lowercase.
If a command requires a callsign, enter the callsign
in uppercase if it is an Echolink callsign,
in lowercase if it is an IRLP node# or Asterisk node.
The following commands are understood by the bridge:
(Commands were changed to accomodate sysop control scripts).
All commands return responses to the admin user.

WARNING: There is one command that you should not use.
That command is ".irlp_failure".
It is used by the rptDir_IRLP_failure script
which is called by the following IRLP scripts:

/home/irlp/scripts/call
/home/irlp/scripts/connect_to_reflector
/home/irlp/scripts/experimental_call
/home/irlp/scripts/on
/home/irlp/scripts/on_to_remote
/home/irlp/scripts/control

It notifies the rtpDir bridge that
the IRLP connect call has failed
and that it should initiate clean-up
without waiting for conxTimeout timer to expire.

NOTE: The commands .cstn, .cref and .irlp_failure will not
be processed by rtpDir bridge if accessIRLP=no

Connect to an Echolink station by callsign
example: .connect *ECHOTEST*

Connect to an Echolink station by node number
example: .cnode 9999

Connect to an IRLP node:
example: .cstn stnXXXX
example: .cref refXXXX
   where XXXX is the IRLP node#
WARNING: Disconnect from IRLP first before you execute cstn or cref commands,
         otherwise IRLP gets confused.

Disconnect from a station
example: .disconnect *ECHOTEST*
         .kick *ECHOTEST*
         .dnode 9999
example: .disconnect stnXXXX
         .kick stnXXXX
         .dstn XXXX
example: .disconnect refXXXX
         .kick refXXXX
         .dref XXXX
   where XXXX is the IRLP node#

Disconnect all stations
.disconnect all
.kick all
.dall

Disconnect the IRLP node(s) only
.disconnect irlp
.kick irlp
.dirlp

Disconnect Echolink stations only
.disconnect el
.kick el
.del

Send a command to an Asterisk node
.cast *32000
.cast *12000

.dstar number
where number points to a D-star node inside the file dstar5198.txt
  The number starts with 1.
  Special case: If number is 0, rtpDir will disconnect from the dstar node.

Administer the admin list
.allow list
.allow add *ECHOTEST*
.allow delete *ECHOTEST*

Show who is logged in as admin
.admins

Disable non-IRLP part of rtpDir
An incoming IRLP station can still make it thru if accessIRLP=yes
.disable

Enable non-IRLP part of rtpDir
.enable

Enable IRLP part of rtpDir
.irlpon

Disable IRLP part of rtpDir
.irlpoff

Lookup a station
example: .lookup *ECHOTEST*

Ban stations
.ban list
.ban add *ECHOTEST*
.ban delete *ECHOTEST*

Mute stations:
show who is muted: .mute

```
mute all stations:     .mute -a
mute a station:        .mute ref9990
                       .mute *ECHOTEST*
mute talker:           .mute .

Unmute stations
unmute all stations:   .unmute -a
.unmute *ECHOTEST*
.unmute ref9990

Mark stations as deaf:
Show "deaf" stations:   .deaf
mark all stations deaf: .deaf -a
mark one station deaf:  .deaf *ECHOTEST*
                        .deaf ref9990
mark talking station
   as deaf:             .deaf .

"Un-deaf" stations
undeaf all stations:   .undeaf -a
.undeaf *ECHOTEST*
.undeaf ref9990


Mark the dstar station DEAF
.dstarDeaf

Remove the "DEAF" mark from the dstar station
.dstarUndeaf

Send a text message to all connected stations:
.message  test123

.save
It saves changes to the 4
files(Books,Private,Banned,admin)

.cnfo
It turns on CNF checkbox

.cnff
```

It tunrs off CNF checkbox

.busy on
.busy off

.version
.refresh

.uptime

.stats

Abort a connection timer in progress: .abort

.users
.shutdown

set bridge audio on: .brvo
set bridge audio off: .brvf

set bridge text on: .brto
set bridge text off: .brtf

set NSM on: .nsmo
set NSM off: .nsmf

set NSD on: .nsdo
set NSD off: .nsdf

enable detection of conference loops: .dclo
disable detection of conference loops: .dclf

.record
The record command is a toggle.
      It records into rtpDir_recorded.gsm from all connected nodes.
      (Asterisk, IRLP, Echolink).
      Use the command once to start recording,
      use it again to stop recording.
      If you forget to stop recording, you will run out of space.

.play
The play command is a toggle.
It plays back the file rtpDir_recorded.gsm to all connected nodes, Asterisk, IRLP, Echolink.
You can execute again to stop playing or let it finish playing back the whole file/announcement.

.conx
The conx command report nodes connected.

Note: Average size of a recorded QSO is 20 KB per 10 seconds.
Name format of a QSO file: rtpDir_recorded.gsm
You may playback that file with playgsm.
playgsm will use the default sound card to playback the file.

The hard way(using netcat utility software)

This method is used mostly for scripting to control the rtpDir bridge without being connected to it.
It is also used by IRLP when a dtmf sequence is received from the IRLP radio.
The netcat(nc) utility software is used in this case, which it is mostly found on Linux/Unix systems, although there are versions of it for DOS/Windows.
Also in this case, the rtpDir bridge will accept the commands sent to it this way, only if the netcat utility software was started on the same machine that the rtpDir bridge is running on.
In other words, in order to use this method, you will have to log into the system, using the ssh tool which is a safe and secure way to gain access to the system and then run the netcat utility software.
There are ssh versions also for DOS/Windows.
One that comes to mind is PuTTY.

After you've logged into the machine using ssh or PuTTY,
Start the netcat utility software like this:
nc -u -p <txtCmdReplyPort> 127.0.0.1 <port>

OR, if you do not want to get a response from rtpDir
    and only interested in sending commands to it
    then start it like this:
nc -u 127.0.0.1 <port>

where <txtCmdReplyPort> is the value of txtCmdReplyPort
found inside the 5198.conf and <port> is the value of port
found inside the 5198.conf file.
Usually, you can execute the netcat utility software like this:
(assuming you have not changed the default values inside 5198.conf)
nc -u -p 6500 127.0.0.1 5198

OR, if not interested in rtpDir's responses to your commands:
nc -u 127.0.0.1 5198

At this point the netcat software is waiting for commands.
The remote text commands in this case have the following
format: o.<command>
  where
      o is just the letter o, which means you're sending
          text to the bridge and not audio and
      <command> is one of the commands listed under the section
          "The easy way"

NOTE:
For the power user:

```
------------------
Each command can be put
  into a script that can be called from
  /home/irlp/custom/custom_decode file during IRLP
operation
  while rtpDir is running in "Echolink + IRLP" mode
  and a dtmf is received from the IRLP radio.

First, add a dtmf decode line to the file /home/irlp/
custom/custom_decode.
Here is a line in the file /home/irlp/custom/
custom_decode
   that forces the execution of the script file
rtpDir_EL_con
   whenever the IRLP radio user presses dtmf B3 plus
some more
   dtmfs to connect to an Echolink node.

# example B39999 will connect to Echolink node 9999,
which is *ECHOTEST*
if [ ${1#B3} != $1 ] ; then rtpDir_EL_con ${1#B3} ;
exit 1 ; fi

After you've added the above line to /home/irlp/custom/
custom_decode file,
create the script file rtpDir_EL_con  and place it
under the
/home/irlp/scripts directory.

The following are the contents of the script file
rtpDir_EL_con
==========================================================
========

#!/bin/bash

rm -rf /tmp/rtpDir_EL_con.nc
touch /tmp/rtpDir_EL_con.nc
echo "o.cnode $1"  > /tmp/rtpDir_EL_con.nc

# port 5198 is the Echolink port
```

```
nc -w 2 -u 127.0.0.1 5198 < /tmp/rtpDir_EL_con.nc

# Last line must always be: exit 1, other wise IRLP may
get "confused"
exit 1
================================================================
==============
```

and finally, set correct execute permissions for IRLP user repeater
while still logged on as root,
by executing the following commands, while you are in /home/irlp/scripts directory.

```
chown repeater:repeater rtpDir_EL_con
chmod +x rtpDir_EL_con
chmod o-rx rtpDir_EL_con
```

Examples:
  List the connected users: o.users

  Request a connection to an Echolink station by callsign: o.connect *ECHOTEST*
  Request a connection to an Echolink station by node number: o.cnode 9999

  Request a connection to an IRLP station:
o.cstn stnXXXX
  Request a connection to an IRLP reflector:
o.cref refXXXX
     where XXXX is the IRLPnode#
  WARNING: Disconnect from IRLP first before you execute cstn or cref commands,
         otherwise IRLP gets confused.

  Disable Echolink: o.disable
  Enable Echolink: o.enable
  Shut rtpDir down: o.shutdown
  Start/stop recording: o.record
    (Records into rtpDir_recorded.gsm file

```
     Use it once to start recording, use it again to
stop recording.
     If you forget to stop recording, you will run out
of disk space).
  Playback a file: o.play
    (plays back the file rpDir_recorded.gsm)
  Get the version:  o.version
  Find out when bridge last started:  o.uptime
  Get the statistics:  o.stats
  Report connected nodes: o.conx

  Disconnect an Echolink station:     o.disconnect
*ECHOTEST*
     OR                               o.kick *ECHOTEST*
     OR                               o.dnode 9999

  Disconnect the IRLP node:           o.disconnect
stnXXXX
     OR                               o.kick stnXXXX
     OR                               o.dstn XXXX

  Disconnect an IRLP reflector:       o.disconnect
ref9990
     OR                               o.kick ref9990
     OR                               o.dref 9990

  Disconnect the IRLP node(s) only:   o.disconnect irlp
     OR                               o.kick irlp
     OR                               o.dirlp

  Disconnect Echolink nodes only:     o.disconnect el
     OR                               o.kick el
     OR                               o.del

  Disconnect all stations:            o.kick all
     OR                               o.dall

  Disconnect from the dstar node:    o.dstar 0

  Disconnect and connect
    to a new dstar node:             o.dstar number
```

(where smallest number is 1)

Enable/Disable IRLP: o.irlpon
o.irlpoff

Send a text message to all connected stations:
o.message test123
Of course, IRLP nodes will not receive anything.

and so on...

When you're done with sending commands to rtpDir,
Hit Ctrl-C on your keyboard. (Control-C)

OPERATION
=========
When the program is started successfully, you should see
the status line(at the bottom of the screen) with:
Logged in OK..., and soon after
that it should say:
Downloading station list....Download finished.
Menu option "Help/Login msgs", will inform you
if something went wrong.

After 5 seconds or so(30 seconds for dial-up users),
the list of stations
will show under Conferences/Repeaters/Links/....
The initial download is a full compressed download,
any download after that, is a differential compressed
download, unless the server went down or
you lost your connection.

Operating as a PC STATION

Start the software.
Let it download the list of stations.
Set the 2 timers(Login and Refresh).

Choose a tab: Confs,Rptrs,Links,Users,Books.
Double-click on a station.
Choose "Connect".
Wait till the station is connected
   or the connect timer expires.
   if not connected by then, you get a TIME-OUT message
   in the status line.
Other reasons you can't connect:
   remote station is Busy, ...
Set Busy(Check) if you dont
   want another user connecting to you
   while you are on a QSO.

Operating as a bridge/Conference

Start the software.
Let it download the list of stations.
Set the 2 timers(Login and Refresh).
Set BA ON and BT ON.
Set prv ON or OFF.
Set busy OFF.

Operating as a Link with DTMF commands

The following DTMFs can be sent from a mobile
radio station or HT with a DTMF keypad:
These are dtmfs coming from the Echolink radio.
For dtmfs coming from the IRLP radio,
inspect the file /home/irlp/custom/custom_decode.
For Asterisk DTMF commands to rtpDir bridge,
examine the file 5198.conf, they are configured
using the configuration variable: ast_dtmf_cmd=

- status command.
  Voice response can be one of:
  "CONNECTED", "NOTBUSY"

- disconnect command to disconnect last connected
station.
  Voice response is "DISCONNECTED", "NOTBUSY".

- report who is on top.
  That is usually the last connected station
  or the station active in a QSO.
  Voice response can be one of:
  "NOTBUSY" or the callsign will be announced.

- disconnect command to disconnect all stations
  Voice reponse is "DISCONNECTED".

- enable/disable NSM
  Voice response is "ENABLED" or "DISABLED"

- enable/disable NSD
  Voice response is "ENABLED" or "DISABLED"

- enable/disable detection of conference loops.
  Voice response is "ENABLED" or "DISABLED"

- enable Bridge Audio on/off
  Voice response is "ENABLED" or "DISABLED"

- busy command toggles busy on/off.
  Voice response is "BUSY" or "NOTBUSY".

- Abort a connection
  Voice response is "ENABLED" or
  "ERROR" if a connection timer is active
  on an IRLP station.

- disable command to disable the system.
  Stops login timer, stops refresh timer,
  sets Busy and disconnects users.
  Voice response is "DISABLED".

- enable command to enable the system.
  Restarts timers(login and refresh)
  and unchecks Busy.
  Voice response is "ENABLED".

- shutdown to shutdown the system.

The software is 100% event driven,
so it is possible that the
shutdown action may occur
before it has the chance to
send the voice response
"SHUTDOWN".

- connect by CALLSIGN or by node
  Voice response is one of:
  "NOT FOUND" if station not in the list
  "ERROR" if the station you're trying to connect to,
      did not pass the tests, explained below.
  "CONNECTING TO..." if a connect request was
initiated.
  "TIMEOUT" if the connect request timed out.
  "BUSY" if remote station is busy
  "ACCESS DENIED" if remote station has disallowed
access.
  "CONNECTED" if a connection is made.

- disconnect by callsign
  Voice response is one of:
  "NOT FOUND" or "DISCONNECTED"
  "NOT BUSY".

- Any other DTMF string is invalid and you
  will get the "ERROR" voice response.

The voice response "ERROR" requires some explanation.
You will receive "ERROR" under
these circumstances:
- Trying to connect to your self.
- Trying to connect to a node that is already connected
to you.
- Connection is already in progress.
- You've reached capacity of your node.
- You had previously set your station to Busy.
- You are trying to connect to a banned station.
- You have set your station as private and trying
  to connect to a node that is not listed in your
  private list.

- You are trying to connect to a node
  identified as -R or -L but
  -R or -L connections are not allowed to your node.
- The node you are trying to connect to,
  is assigned to a CALLSIGN with a prefix
  that is not included in the prefix list.
  (Country code validation).
- You're trying to abort a connect request that was
  made to an IRLP station.
- The DTMF command you've sent is unknown.
- The DTMF command is too short.

NOTES
=====
--- Some of the functionality has been removed from rtpDir bridge
    when running it as an IRLP reflector.
    For example, an IRLP reflector will not initiate connect requests
    to IRLP nodes. An IRLP reflector can not really request that an
    IRLP station disconnect permanently from the system, the best
    it can do is, disconnect the IRLP station temporarily but within
    7 seconds the remote IRLP station can re-connect unless it has
    been banned from the reflector.
--- If a station requesting to connect, has an IP address that matches
    one of the stations already connected, that new station will be
    allowed to connect, but it will be marked as DEAF & MUTE.
    This will be forced even if the new station's callsign or node#
    does not match any of the connected stations.
--- When running rtpDir as Echolink + IRLP,
    you will see your own IRLP node on the CONNECTED screen
    along with the remote IRLP node.

--- Multi-conferencing is built-in and always enabled
    but check the meaning of the CNF checkbox on the screen.
--- If at least one station is connected to your station,
    then your name will be set to "(<CALLSIGN>)" if one
    of the connected stations to your station is transmitting while
    you remain connected to a station or conference,
    where <CALLSIGN> is the station's callsign that is transmitting.
    This is so that other stations will know who is transmitting
    from your station and is also used for detecting conference loops.
--- If you get a message "Could not start rtpDir,error ...",
    one or both 5198,5199 ports are locked or in use by another
    software. Run netstat on Unix to find out which software
    has locked that port. On DOS, seek the advice of an expert.
    Or it maybe that you are NOT using 0.0.0.0 for myIP address
    and the machine is behind a router/firewall.
    Or the getlist(getlist_win) program is running. Stop it.
--- If you get the message "Failed to create IRLP data/control socket"
    or "Failed to bind IRLP data/control socket", then
    some IRLP port(s) have been locked by another software.
    The IRLP ports that rtpDir will try to use are
    listed in the rtpDir configuration file as irlpPort.
    (irlpPort + 1) will also be used by rtpDir.
    Most probably you have not made the required changes
    as listed in this domument above under the section

"Additional steps if you plan to run rtpDir as Echolink + IRLP".
Or it maybe that you are NOT using 0.0.0.0 for myIRLP_IP address
and the machine is behind a router/firewall.
--- If you get the message "Trying to open SoundCard device"
but not "SoundCard device opened OK" immediately after it,
then the sound card device is not configured right
and program may hang trying to open it.
On Linux, you must re-configure the sound card
using the ALSA utilities. That will certainly fix the
problem.
On DOS, remove the sound card, look at it, put it back
and pray it will work next time.
--- If you get the message "socket still trying to connect...restarting"
or "connect failed,..." with codes like 10060,110(timeout),
10061,111(connection refused), then one of the servers in
the configuration file is busy with a lot of requests from other stations.
In this case, rtpDir will try the next server in the configuration file.
If you get the code 10035,11=try again/would block,
the station Info text was not sent and that is a temporary
condition, it will be re-sent immediately after that.
In general, we are not translating error codes to message text.
Depending on the Operating system/development tools that
you have installed, consult the file errno.h on Linux which points
to /usr/include/asm-generic/errno-base.h and
/usr/include/asm-generic/errno.h and

    on Windows winerror.h or winbase.h or some other include file
    that points to another file which translates codes to message text.
--- If you get the message "gsm_decode failed...", you have
    interference from another close-by device or the connection
    is somehow bad or parts of the message got distorted during transfer.
    You might still get good audio from the
    remote station or not. Either way the error will go away
    or try to re-connect.
--- If you get the message "Download is active...please wait",
    rtpDir is using the getlist program to
    download the list of stations and another request
    to download became active.
    Nothing to worry about, the download will
    proceed normally or it will time out and the next server
    will be used.
    Download or Login requests will not be allowed to pile up.
--- Login/Download failures are always restarted on the next server
    in the configuration file.
--- Connecting from a mobile or HT, please key up for 2-3 seconds.
    before TXing.
--- No log file rollovers yet, disable the trc checkbox if you
    do not want the log file to get bigger, or not interested in
    capturing daily activity of rtpDir bridge to a log file on disk.
    The log file on disk is 5198.log
--- If a user is rude or not following part 97 rules, you have a choice of
    banning(no connects are allowed) or muting(no audio

packets from that source).
--- If EL_login=no, this assumes that you want to run a private
    network, so no Echolink logins/downloads
    are allowed and you will have to prepare the local file
    stnFile.txt and distribute it to the users of the private network.
    In this case, you can choose any port value you like
    in the configuration file.
--- If soundCard=no, then the serial port is not opened either,
    so no radio control will be attempted.
--- If running rtpDir with a *CONFERENCE* callsign
    the sound card device will not be opened.
--- If the DNS nameservers point to invalid IP addresses,
    program may hang when trying to do File/Shutdown
    or it may hang trying to access the Echolink servers.
--- The software getlist_win or getlist for Linux
    systems downloads/decompresses the station list after a successful login.
    The temporary compressed file can be found in the QSOdir,
    with file name rtpDir_stns_<port>.tmp
    A zlib utility, zpipe, can be used to decompress the file.
    Run zpipe like this:
    zpipe rtpDir_stns_5198.tmp
    zlib was developed by the authors of zlib software.

File/LoginTimer & File/RefreshTimer menu options
==
If you have not logged on, in the last 7-8
   minutes, EchoLink will drop you off
   the list and any downloads after that will fail.
The download will fail and you will get the message:
(along with bogus IPaddress of 127.0.0.1 and
bogus Node numbers).

****
NOT LOGGED IN
Because of a system problem,
   you are not currently logged in.
Please wait several minutes
for the server to reset.
+++
****
That is from our own observations.
So use a LoginTimer of no more
   than 7-8 minutes, 6 is best, if you can.
The Refresh Timer is optional, you can set it
   to 0 to disable any downloads in case
   you want to do the manual download
   using the menu option File/LoginRefresh.
If you prefer to have automatic downloads,
   dont set it to a small number, set it
   to 5 so that the differential/compressed
   download would work the best.
The differential/compressed download
   will only bring in new stations
   or stations that changed their location info
   or IP address since your previous download
   and any stations that
   logged off the system will be dropped
   off the list. It takes up to 5 seconds
   for full compressed download and up to 2-3 seconds
   for differential/compressed download.
We were informed that Echolink will
   drop older methods of downloading
   and only the compressed methods of
   downloading will be valid in the future.

Creating your own CW ID announcement
====================================
To create a gsm file that contains CW code
   run cwgsm like this: cwgsm -w 7 -f 200 -e <
cwid.txt
   where cwid.txt is the English message text.
cwgsm will create a file cwid.gsm
You can play back the file with playgsm.

To make sure CW/Morse works with rtpDir, some changes were made
   to allow for 16-bit code, no access to sound card, generation of GSM files
   and to run on both Linux and Windows.
cwgsm is a modified version of Morse software.
Contact the author of Morse software for details.

About GSM files:
==========
Files with extension .gsm are headerless gsm files
   that can be manipulated with any software that
   can process headerless gsm files.
We believe libsndfile could do that.
We decided to use gsm_encode and gsm_decode
   since RTP protocol is using that.
Contact the authors of gsm_encode/decode
   for more details.
Contact the authors of libsndfile
   for more details.

TODO LIST
========
...

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Berlin, 28.11.1994
Jutta Degener
Carsten Bormann
zlib.h -- interface of the 'zlib' general purpose compression library
version 1.2.3, July 18th, 2005
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The data format used by the zlib library is described by RFCs (Request for
Comments) 1950 to 1952 in the files http://www.ietf.org/rfc/rfc1950.txt
(zlib format), rfc1951.txt (deflate format) and rfc1952.txt (gzip format).
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