Add My Telescope

How to add your telescope to common pulsar software repos

- Sigproc
- PSRCHIVE / DSPSR

Sigproc

> Software: Sigproc
>
> Key Type(s): Int, String
>
> Depends on: TEMPO1
>
> Change at: Compilation
>
> Repo: https://github.com/FRBs/sigproc
>
> Quick links: src/alias.c https://github.com/FRBs/sigproc/blob/master/src/aliases.c

Sigproc requires a unique number for your telescope and processing machine to be identified. It must be changed prior to compiling and installing Sigproc. You can chose any 32-bit integer as your unique identifier, the existing IDs are present in the `alias.c` file you will be editing.

Any names must be less than 79 characters long, beyond that you may encounter undefined behaviour.

All changes need to be made in the `src/alias.c` file. Three changes are required,

- `char tempo_site(int telescope_id)` needs your chosen unique identifier and your TEMPO1 location code. Note, this should be a single character, not a string.

```
/*** Previous cases ***/
case my_telescope_id:
    return my_tempo_char;
    break; // Unnecessary, but matches the rest of the function
/*** Default case ... ***/
```

- `char *telescope_name (int telescope_id)` needs your chosen telescope name and unique identifier.

```
/*** Previous cases ***/
  case my_telescope_id:
    strcpy(string, "my_telescope_name");
    break;
```

```
    /*** Default case ... ***/
```

- `char *backend_name (int machine_id)` needs your chosen processing machine name and another (or the same) unique identifier.

```
    /*** Previous cases ***/
    case my_telescope_id:
      strcpy(string, "my_processing_node_name");
      break;
    /*** Default case ... ***/
```

PSRCHIVE / DSPSR

> “
>
> Software: PSRCHIVE / DSPSR (intertwined)
>
> Key Type(s): Int, String
>
> Depends on: Sigproc, TEMPO, TEMPO2
>
> Change at: Compilation
>
> Repo: https://sourceforge.net/projects/psrchive/ https://sourceforge.net/projects/dspsr/
>
> Quick links:
>
> - PSRCHIVE
> - Util/tempo/itoa.C https://sourceforge.net/p/psrchive/code/ci/master/tree/Util/tempo/itoa.C
> - Base/Extensions/Pulsar/Telescopes.h https://sourceforge.net/p/psrchive/code/ci/master/tree/Base/Extensions/Pulsar/Telescopes.h
> - Base/Extensions/Telescopes.C https://sourceforge.net/p/psrchive/code/ci/master/tree/Base/Extensions/Telescopes.C
> - DSPSR
> - Kernel/Formats/sigproc/SigProcObservation.C https://sourceforge.net/p/dspsr/code/ci/master/tree/Kernel/Formats/sigproc/SigProcObservation.C

PSRCHIVE and DSPSR are heavily intertwined, and need multiple changes at compilation time to provide initial support for a telescope, with further changes possible by modifying your TEMPO(2) configurations at runtime.

This focuses on the base software and Sigproc reader/writers, other output types may require further changes(e.g., FITS can be modified in the DSPSR `Kernel/Formars/FITS/..` path).

You will need to chose a site or telescope name, as well as be able to characterise your type of telescope.

- PSRCHIVE
  - Util/tempo/itoa.C: `static int default_aliases ()` needs you to tie your TEMPO1 code to your chosen site / telescope name.

```
/*** Previous aliases ***/
add_alias (TEMPO_CODE, "MYSITENAME");
/*** Further aliases ***/
```

  - The itoa switch statement or the tempo2 logic needs to be able to identify your telescope. An example is not provided for this step.
  - Base/Extensions/Pulsar/Telescopes.h: A new function prototype following the signature `void Pulsar::Telescopes::MYSITENAME(Telescope *t)` inside the namespace "`Telescopes`"

```
/*** Previous Prototypes ***/
void Pulsar::Telescopes::MYSITENAME(Telescope *t)
/*** More prototypes ***/
```

  - Base/Extensions/Telescopes.C: A new function with signature following the prototype you just defined

```
/*** Other telescope definitions ***/

void Pulsar::Telescopes::MYSITENAME(Telescope *t)
{
  t->set_name ("MYSITENAME");
  // You will need to describe the properties of your telescope as well, check other entries in this file for further details.
}
/*** Further telescope definitions ***/
```

- DSPSR
  - Kernel/Formats/sigproc/SigProcObservation.C: static std::string get_sigproc_telescope_name (int _id) needs your Sigproc site identifier and name.

```
/*** Previous Sigproc ID cases ***/
  case MY_SIGPROC_SITE_ID:
```

```
    return "MYSITENAME";
  /*** Further Sigproc ID cases ***/
```

- Kernel/Formats/sigproc/SigProcObservation.C: static int get_sigproc_telescope_id (string name) needs your Sigproc site name and TEMPO1/ITOA identifier.

```
/*** Other site code ifs ***/
else if (itoa == "MY_TEMPO_CODE") return MY_SIGPROC_SITE_ID;
/*** Further site code ifs ***/
```

- Kernel/Formats/sigproc/SigProcObservation.C: static std::string get_sigproc_machine_name (int _id, int _telescope) needs your Sigproc processing node identifier and name.

```
/*** Previous Sigproc ID cases ***/
  case MY_SIGPROC_PROCESSING_NODE_ID:
    return "MYNODENAME";
  /*** Further Sigproc ID cases ***/
```

- Kernel/Formats/sigproc/SigProcObservation.C: void dsp::SigProcObservation:: unload_global () needs your Sigproc processing node identifier and name.

```
/*** Other processing node ID ifs ***/
else if(get_machine().compare("MYNODENAME")==0)machine_id=MY_NODE_ID;
/*** Further processing node ID ifs ***/
```