

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY
- LIGO -
CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Document Type LIGO-T970183-00 - C 26June97
How to Build the Hanford Mechanical Room Station EPICS Vacuum Controls System
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Distribution of this draft:
Hanford CDS, Operators

This is an internal working note
of the LIGO Project..

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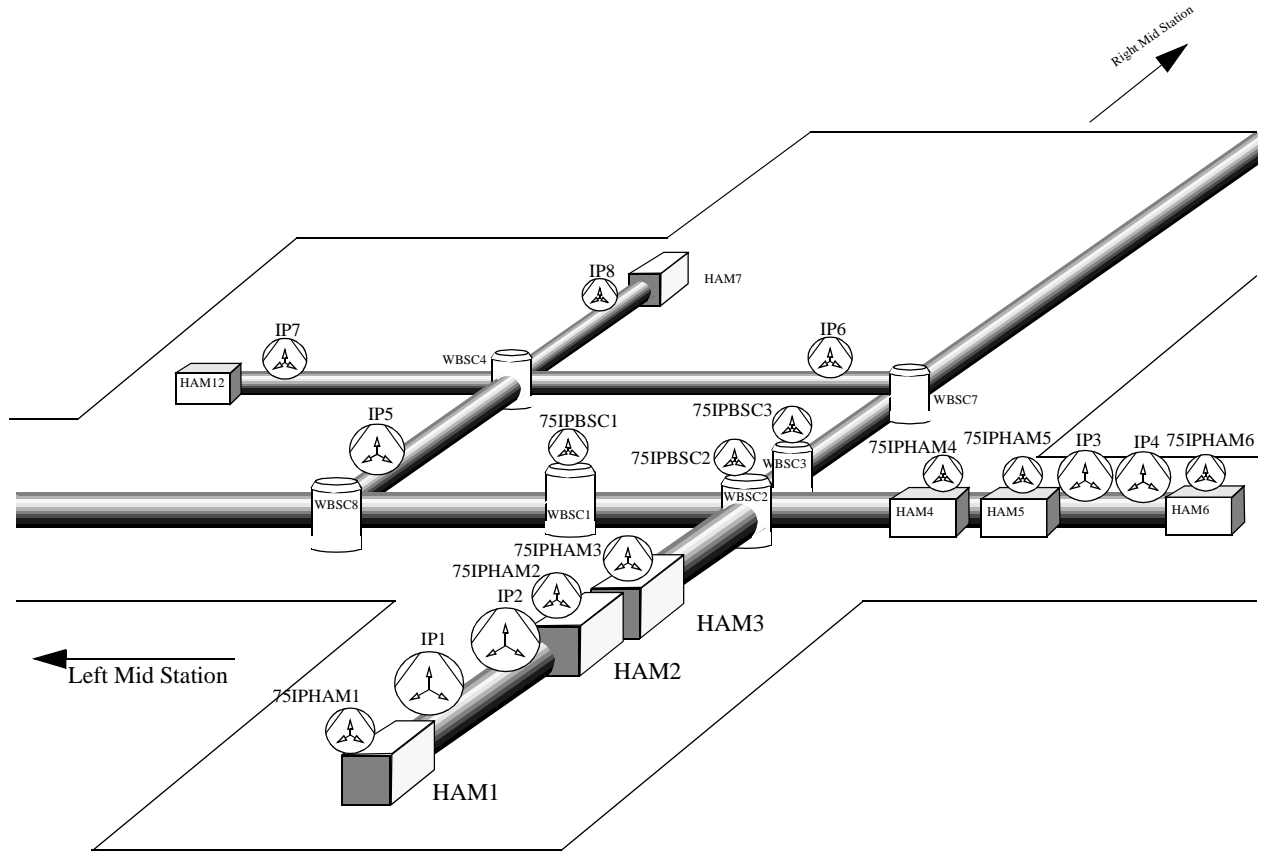
1.0 The Hanford Left Mechanical Room Station.

The Hanford Left Mechanical Room Vacuum Station is designated MR.
 The Vacuum system comprises:

Table 1: Hanford MR Vacuum Systems.

System	#1	#2	#3	#4	#5	#6	#7	#8	#9
2500l/s Ion Pumps	IP1	IP2	IP3	IP4	IP5	IP6	IP7	IP8	
75l/s Ion Pumps	75IP BSC1	75IP HAM1	75IP HAM2	75IP BSC2	75IP HAM3	75IP HAM4	75IP BSC3	75IP HAM5	75IP HAM6

The vacuum equipment is arranged in the following order:



2.0 File Definitions.

Table 2: File Macro Definitions.

Macro	Path
\$(GENERIC)	/opt/ligo/b/epics/apple/Hanford/VE/GENERIC

Table 2: File Macro Definitions.

Macro	Path
\$(OPI_GENERIC)	/opt/ligo/b/epics/apple/Hanford/VE/opi/medm/GENERIC
\$(MR_TEST)	/opt/ligo/b/epics/apple/Hanford/VE/hanford63/test
\$(CONFIG_MR_TEST)	/opt/ligo/b/epics/apple/Hanford/VE/CONFIG/MR/test
\$(OPI_MR)	/opt/ligo/b/epics/apple/Hanford/VE/opi/medm/MR
\$(ALH_GEN)	/opt/ligo/b/epics/apple/Hanford/VE/alh/GENERIC
\$(ALH_MR)	/opt/ligo/b/epics/apple/Hanford/VE/alh/MR

3.0 Database Generation.

3.1 2500l/s Ion Pumps.

Only main db file. Makefile is \$(CONFIG_MR_TEST)/makefile linked into the \$(MR_TEST) directory. Build the IP system with the command:

```
> make IP
```

3.1.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE_IP_GEN.db (gdct generated).

Configuration file is \$(CONFIG_MR_TEST)/HVE-MR:IP.config linked into the \$(MR_TEST) directory.

Output files are HVE-MR:IPn.db and HVE-MR:IPnS.db (n=1,2,3,4,5,6,7,8).

3.2 75l/s Ion Pumps.

Only main db file. Makefile is \$(CONFIG_MR_TEST)/makefile linked into the \$(MR_TEST) directory. Build the 75IP system with the command:

```
> make 75IP
```

3.2.1 Main Database.

Generic db file is \$(GENERIC)/test/database/VE_75IP_GEN.db (gdct generated).

Configuration file is \$(CONFIG_MR_TEST)/HVE-MR:75IP.config linked into the \$(MR_TEST) directory.

Output files are HVE-MR:75IPBSCn.db and HVE-MR:75IPBSCnS.db (n=1,2,3), HVE-MR:75IPHAMn.db and HVE-MR:75IPHAMnS.db (n=1,2,3,4,5,6).

3.3 Pump Carts.

TBD

3.4 Full List of Database Files.

Table 3: Full database db file list.

System	File #1	File #2
IP 1	HVE-MR:IP1.db	HVE-MR:IP1S.db
IP 2	HVE-MR:IP2.db	HVE-MR:IP2S.db
IP 3	HVE-MR:IP3.db	HVE-MR:IP3S.db
IP 4	HVE-MR:IP4.db	HVE-MR:IP4S.db
IP 5	HVE-MR:IP5.db	HVE-MR:IP5S.db
IP 6	HVE-MR:IP6.db	HVE-MR:IP6S.db
IP 7	HVE-MR:IP7.db	HVE-MR:IP7S.db

Table 3: Full database db file list.

System	File #1	File #2
IP 8	HVE-MR:IP8.db	HVE-MR:IP8S.db
75IP BSC1	HVE-MR:75IPBSC1.db	HVE-MR:75IPBSC1S.db
75IP BSC2	HVE-MR:75IPBSC2.db	HVE-MR:75IPBSC2S.db
75IP BSC3	HVE-MR:75IPBSC3.db	HVE-MR:75IPBSC3S.db
75IP HAM1	HVE-MR:75IPHAM1.db	HVE-MR:75IPHAM1S.db
75IP HAM2	HVE-MR:75IPHAM2.db	HVE-MR:75IPHAM2S.db
75IP HAM3	HVE-MR:75IPHAM3.db	HVE-MR:75IPHAM3S.db
75IP HAM4	HVE-MR:75IPHAM4.db	HVE-MR:75IPHAM4S.db
75IP HAM5	HVE-MR:75IPHAM5.db	HVE-MR:75IPHAM5S.db
75IP HAM6	HVE-MR:75IPHAM6.db	HVE-MR:75IPHAM6S.db

3.5 Database Totals.

Table 4: Left LVEA-Y Station Totals.

Number of db files	34
Number of records	349

4.0 Sequencer Generation.

No Sequencers for MR.

5.0 C Code Generation.

No C Code for MR.

6.0 MEDM Screens Generation.

6.1 2500l/s Ion Pumps.

2500l/s ion pumps have two displays;main and simulation. Makefile is \$(OPI_MR)/makefile, build the 75IP displays with the command;

make IP

Configuration files are symbolic linked from \$(CONFIG_MR_TEST) to the current directory.

6.1.1 Main.

Generic adl file is \$(OPI_GENERIC)/VE_IP_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG_MR_TEST)/HVE-MR:IP.config.

Output files are \$(OPI_MR)/HVE-MR:IPn.adl, (n=1,2,3,4,5,6,7,8).

6.1.2 Simulation.

Generic adl file is \$(OPI_GENERIC)/VE_IP_GEN_S.adl (MEDM generated).

Configuration file is \$(CONFIG_MR_TEST)/HVE-MR:IP.config.

Output files are \$(OPI_MR)/HVE-MR:IPnS.adl, (n=1,2,3,4,5,6,7,8).

6.2 75l/s Ion Pumps.

75l/s ion pumps have two displays;main and simulation. Makefile is \$(OPI_MR)/makefile, build the 75IP displays with the command;

make 75IP

Configuration files are symbolic linked from \$(CONFIG_MR_TEST) to the current directory.

6.2.1 Main.

Generic adl file is \$(OPI_GENERIC)/VE_75IP_GEN.adl (MEDM generated).

Configuration file is \$(CONFIG_MR_TEST)/HVE-MR:75IP.config.

Output files are \$(OPI_MR)/HVE-MR:75IPBSCn.adl (n=1,2,3), HVE-MR:75IPHAMn.adl (n=1,2,3,4,5,6).

6.2.2 Simulation.

Generic adl file is \$(OPI_GENERIC)/VE_75IP_GEN_S.adl (MEDM generated).

Configuration file is \$(CONFIG_MR_TEST)/HVE-MR:75IP.config.

Output files are \$(OPI_MR)/HVE-MR:75IPBSCnS.adl (n=1,2,3), HVE-MR:75IPHAMnS.adl (n=1,2,3,4,5,6).

6.3 Pump Carts.

TBD

6.4 MEDM File Totals.

Table 5: MEDM File List.

HVE-MR:IP1.adl	HVE-MR:IP1S.adl
HVE-MR:IP2.adl	HVE-MR:IP2S.adl
HVE-MR:IP3.adl	HVE-MR:IP3S.adl
HVE-MR:IP4.adl	HVE-MR:IP4S.adl
HVE-MR:IP5.adl	HVE-MR:IP5S.adl
HVE-MR:IP6.adl	HVE-MR:IP6S.adl
HVE-MR:IP7.adl	HVE-MR:IP7S.adl
HVE-MR:IP8.adl	HVE-MR:IP8S.adl
HVE-MR:75IPBSC1.adl	HVE-MR:75IPBSC1S.adl
HVE-MR:75IPBSC2.adl	HVE-MR:75IPBSC2S.adl
HVE-MR:75IPBSC3.adl	HVE-MR:75IPBSC3S.adl
HVE-MR:75IPHAM1.adl	HVE-MR:75IPHAM1S.adl
HVE-MR:75IPHAM2.adl	HVE-MR:75IPHAM2S.adl
HVE-MR:75IPHAM3.adl	HVE-MR:75IPHAM3S.adl
HVE-MR:75IPHAM4.adl	HVE-MR:75IPHAM4S.adl
HVE-MR:75IPHAM5.adl	HVE-MR:75IPHAM5S.adl
HVE-MR:75IPHAM6.adl	HVE-MR:75IPHAM6S.adl

Total number of adl files=34.

Total number of channels monitored and/or controlled = 393.

7.0 Alarm Handler Generation.

7.1 2500l/s Ion Pumps.

Generic alh config include file is \$(ALH_GEN)/VE_IP_GEN.alhConfig linked into \$(ALH_MR). MR Vacuum template file is \$(ALH_MR)/VacTemplate.alhConfig. Makefile is \$(ALH_MR)/makefile, build the Alarm Handler files with the command;

make

Configuration files are symbolic linked from \$(CONFIG_MR_TEST) to the current directory. Output file for the MR system is MR.alhConfig.

7.2 75l/s Ion Pumps.

Generic alh config include file is \$(ALH_GEN)/VE_75IP_GEN.alhConfig linked into \$(ALH_MR). MR Vacuum template file is \$(ALH_MR)/VacTemplate.alhConfig. Makefile is \$(ALH_MR)/makefile, build the Alarm Handler files with the command;

make

Configuration files are symbolic linked from \$(CONFIG_MR_TEST) to the current directory. Output file for the MR system is MR.alhConfig.

7.3 Pump Carts.

TBD

7.4 Final Files

The output from alh generation is a single alh config file for the entire building.

Table 6: Alarm Handler Configuration File List.

MR.alhConfig

Total number of channels monitored for alarm activity on Mechanical Room Station = 39.

8.0 SAMMI Screens Generation.**8.1 Gauge Pairs.**

TBD

8.2 Thermocouples.

TBD

8.3 Gate Valves.

TBD

8.4 Cryo Pumps.

TBD

8.5 2500l/s Ion Pumps.

TBD

8.6 75l/s Ion Pumps.

TBD

8.7 Pump Carts.

TBD

9.0 BURT Generation.**9.1 Gauge Pairs.**

TBD

9.2 Thermocouples.

TBD

9.3 Gate Valves.

TBD

9.4 Cryo Pumps.

TBD

9.5 2500l/s Ion Pumps.

TBD

9.6 75l/s Ion Pumps.

TBD

9.7 Pump Carts.

TBD

10.0 Archiver Generation.

10.1 Gauge Pairs.

TBD

10.2 Thermocouples.

TBD

10.3 Gate Valves.

TBD

10.4 Cryo Pumps.

TBD

10.5 2500l/s Ion Pumps.

TBD

10.6 75l/s Ion Pumps.

TBD

10.7 Pump Carts.

TBD