



Memorandum

To: File

From: John Effland

Date: 17 May 2002

Subject: Database Query to Retrieve Latest Excitation and Results Records

The SIS mixer measurement system will produce tremendous amounts of data corresponding to the excitations and results from stepping through the many parameters involved in mixer testing.

Excitations include:

- LO frequency and power
- Magnet current
- Commanded Junction bias voltage for 1 to 4 junctions
- IF frequency

Results include the following measured parameters:

- Junction bias voltages for 1 to 4 junctions
- Junction bias currents for 1 to 4 junctions
- Magnet current
- Noise power from either or both mixer outputs when switched to hot load
- Noise power from either or both mixer outputs when switched to cold load

It is important that the design of the database tables, called the schema, incorporate sufficient flexibility to accommodate recording and the excitations in any order. For example, it may be useful to set up the receiver, then step each of the junction voltages and record the resulting noise powers. Next, the user may step the magnet current and repeat measuring performance as the bias voltages are again stepped.

```
/* 2002-05-17 jee
This selects the most recent excitation records
along with the excitation given by the excite key.
The first IN subquery selects the most recent records having a relParent
value that is found from the second IN subquery.
The third IN subquery removes those records with the same excitation type
as the parameter.
The record with the excitation type just removed is added by the final OR.
*/
SELECT * FROM EXCITE
WHERE ((ExciteKey
  IN (SELECT max(ExciteKey) as MaxKey FROM Excite WHERE relParent
      IN (SELECT relParent FROM EXCITE WHERE EXCITEKEY = 13)
  GROUP BY Type ))
  AND ((Type) NOT IN (SELECT TYPE FROM EXCITE WHERE EXCITEKEY = 13) ))
  OR ((ExciteKey = 13))
ORDER BY ExciteKey
```

Table 1 shows a subset of excitation records. Note that there are multiple entries for the magnet current (Imag) the 4th mixer junction voltage.

Table 2

relParent	ExciteKey	Type	Param	DateTime
10	10	Flo	230	2002-05-16 15:52:32
10	11	Plo	1	2002-05-16 15:52:45
10	12	Imag	66	2002-05-16 15:53:05
10	13	Imag	67	2002-05-16 15:53:17
10	14	Plo	2	2002-05-17 13:34:49
10	15	Vj1	10.233	2002-05-17 14:36:41
10	16	Vj2	12.2	2002-05-17 14:37:16
10	17	Vj3	10	2002-05-17 14:37:26
10	18	Fif	5.8	2002-05-17 14:37:39
10	19	Vj4	9.2	2002-05-17 14:38:06
10	20	Imag	69	2002-05-17 14:38:38
10	32	Vj4	11.23	2002-05-17 15:35:11

Table 1: Subset of Excitation database table for a particular measurement series.

Running the query produces the results shown in Table 2. That is, given a particular foreign key value from the results table that corresponds to a single excitation record, find all the relevant excitation records.

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10	32	Vj4	11.23	2002-05-17 15:35:11

Table 2: Results set from running the query on Table 1.

This can be coupled to a results query that will provide test results corresponding to this excitation, namely, one with that refers to the ExciteKey with the value 12.