Bolocam Thermometry Wiring Table

FRIDGE BOARD

Function	RF Filter Cold Side		CABLE E/F (RF Filter Warm Side)			CABLE G			Thermometry Board				BNC	SCB 100	PCI 6031	Thermometry Board Comment
	1: 51-s socket	2: 9-s socket	1: 51-s socket	2: 9-s socket	3: 22-55 pin	1: 22-55 socket	2: 50-s socket	3/4: 9-s socket	input (sin1)	top output (sin3)	readout circuit	bottom output (sin2)				
none	1		1		A	A		4								
none	2		2		C	C		3								
none		4 & 5		4 & 5	D	D		8								
none		1 & 2		1 & 2	F	F		7								
GND	19		19		G	G	1&34		1&34	1&34	NC	NC	9			
120K diode	49		49		FF	FF	2		2	2	diode src 1	NC	11	5	1	sin2 pin 2 connected to driven ground.
120K diode	48		48		EE	EE	18		18	18	diode src 1	18	11	6	1	sin2 pin 18 connected through 100Ω.
77K diode	45		45		BB	BB	3		3	3	diode src 3	NC	13	9	3	sin2 pin 3 connected to driven ground.
77K diode	44		44		AA	AA	19		19	19	diode src 3 (HW)	19	13	10	3	sin2 pin 19 connected through 100Ω.
none	41		41		x	x	4		4	4	NC (heater)	NC	14			sin2 pin 4 formerly wired to GRT readout 2 V, now disconnected
none	40		40		w	w	20		20	20	NC (heater)	NC	14			sin2 pin 20 formerly wired to GRT readout 2 V, now disconnected
IC 4He HS heater	37		37		t	t	5		5	5	NC (heater)	5	16	17		sin2 pin 5 connected via jumper to sin3.
IC 4He HS heater	36		36		s	s	21		21	21	NC (heater)	21	16	18		sin2 pin 21 connected via jumper to sin3.
IC 4He pump heater	33		33		p	p	6		6	6	NC (heater)	6	59			sin2 pin 6 connected via jumper to sin3.
IC 4He pump heater	32		32		n	n	22		22	22	NC (heater)	22	59			sin2 pin 22 connected via jumper to sin3.
UC pump heater	29		29		j	j	7		7	7	NC (heater)	7	57			sin2 pin 7 connected via jumper to sin3.
UC pump heater	28		28		i	i	23		23	23	NC (heater)	23	57			sin2 pin 23 connected via jumper to sin3.
IC GRT I-	25		25		f	f	8		8	8	GRT readout 2 I	NC	19			
IC GRT I+	24		24		e	e	24		24	24	GRT readout 2 I	NC	19			
IC 3He HS diode	21		21		b	b	9		9	9	diode src 5	NC	21	91	51	sin2 pin 9 connected to driven ground.
IC 3He HS diode	20		20		a	a	25		25	25	diode src 5	25	21	92	51	sin2 pin 25 connected through 100Ω.
UC GRT I-	23		23		d	d	10		10	10	GRT readout 1 I	NC	20	89		
UC GRT I+	22		22		c	c	26		26	26	GRT readout 1 I	NC	20	90		
IC 3He pump diode	27		27		h	h	11		11	11	diode src 6 (HW)	NC	18	71	34	sin2 pin 11 connected to driven ground.
IC 3He pump diode	26		26		g	g	27		27	27	diode src 6 (HW)	27	18	72	34	sin2 pin 27 connected through 100Ω.
IC 3He pump heater	31		31		m	m	12		12	12	NC (heater)	12	58			sin2 pin 12 connected via jumper to sin3.
IC 3He pump heater	30		30		k	k	28		28	28	NC (heater)	28	58			sin 2 pin 28 connected via jumper to sin3.
IC HX diode	35		35		r	r	13		13	13	diode src 7 (HW)	NC	17	11	4	sin2 pin 13 connected to driven ground.
IC HX diode	34		34		q	q	29		29	29	diode src 7 (HW)	29	17	12	4	sin2 pin 29 connected through 100Ω.
IC 4He HS diode	39		39		v	v	14		14	14	diode src 8 (HW)	NC	15	15	6	sin2 pin 14 connected to driven ground.
IC 4He HS diode	38		38		u	u	30		30	30	diode src 8 (HW)	30	15	16	6	sin2 pin 30 connected through 100Ω.
JFET heater	43		43		z	z	15		15	15	NC (heater)	15	60			sin2 pin 15 connected via jumper to sin3.
JFET heater	42		42		y	y	31		31	31	NC (heater)	31	60			sin2 pin 31 connected via jumper to sin3.
77K diode	47		47		DD	DD	16		16	16	NC	NC	12	7		no jumper from sin2 to sin3.
77K diode	46		46		CC	CC	32		32	32	NC	NC	12	8		no jumper from sin2 to sin3.
120K diode	51		51		HH	HH	17		17	17	NC	NC	10	3		no jumper from sin2 to sin3.
120K diode	50		50		GG	GG	33		33	33	NC	NC	10	4		no jumper from sin2 to sin3.
IC 4He pump diode	16		16		X	X	36		36	36	diode src 2	36	23	13	5	sin2 pin 36 connected to driven ground.
IC 4He pump diode	15		15		W	W	35		35	35	diode src 2	35	23	14	5	sin2 pin 35 connected through 100Ω.
IC 3He pump heater	12		12		T	T	38		38	38	NC (heater)	38	55			sin2 pin 38 connected via jumper to sin3.
IC 3He pump heater	11		11		S	S	37		37	37	NC (heater)	37	55			sin2 pin 37 connected via jumper to sin3.
UC pump diode	8		8		N	N	40		40	40	diode src 4	NC	24	73	35	sin2 pin 40 connected to driven ground.
UC pump diode	7		7		M	M	39		39	39	diode src 4	39	24	74	35	sin2 pin 39 connected through 100Ω.
UC GRT V-	4		4		J	J	42		42	42	GRT readout 1 V	42	26	51	16	sin2 pin 42 sees amplified resistor voltage.
UC GRT V+	3		3		H	H	41		41	41	GRT readout 1 V	41	26	52	16	sin2 pin 41 sees amplified resistor voltage.
IC GRT V-	6		6		L	L	44		44	44	GRT readout 2 V (HV	44	25	53	17	sin2 pin 44 sees amplified resistor voltage.
IC GRT V+	5		5		K	K	43		43	43	GRT readout 2 V (HV	43	25	54	17	sin2 pin 43 sees amplified resistor voltage.
UC pump heater	10		10		R	R	46		46	46	NC (heater)	46	54			sin2 pin 46 connected via jumper to sin3.
UC pump heater	9		9		P	P	45		45	45	NC (heater)	45	54			sin2 pin 45 connected via jumper to sin3.
IC 4He pump heater	14		14		V	V	48		48	47	NC (heater)	47	56			sin2 pin 47 connected via jumper. Note the pair flip.
IC 4He pump heater	13		13		U	U	47		47	48	NC (heater)	48	56			sin2 pin 48 connected via jumper. Note the pair flip.
IC 3He HS heater	18		18		Z	Z	50		50	50	NC (heater)	50	22	77		sin2 pin 50 connected via jumper to sin3.
IC 3He HS heater	17		17		Y	Y	49		49	49	NC (heater)	49	22	78		sin2 pin 49 connected via jumper to sin3.

AUX BOARD

Function	RF Filter Cold Side		CABLE E/F (RF Filter Warm Side)			CABLE G			Thermometry Board				BNC	SCB 100	PCI 6031	Thermometry Board Comment
	1: 51-s socket	2: 9-s socket	1: 51-s socket	2: 9-s socket	3: 22-55 pin	1: 22-55 socket	2: 50-s socket	3/4: 9-s socket	input (sin1)	top output (sin3)	readout circuit	bottom output (sin2)				
free	1		1		A	A	none	4								
free	2		2		C	C	none	3								
free	none	4 & 5	none	4 & 5	D	D	none	8								
free	none	1 & 2	none	1 & 2	F	F	none	7								
GND	41		19		G	G	1&34		1&34	1&34	NC	NC	27			
4K plate diode	33		49		FF	FF	2		2	2	diode src 1	NC	29	55	18	sin2 pin 2 connected through 100Ω.
4K plate diode	32		48		EE	EE	18		18	18	diode src 1	18	29	56	18	sin2 pin18 connected to driven ground.
none	29		45		BB	BB	3		3	3	diode src 3	NC	31	59		sin2 pin 3 connected to driven ground. Diode src not in use; no polarity jumper.
none	28		44		AA	AA	19		19	19	diode src 3 (HW)	19	31	60		sin2 pin 19 connected through 100Ω. Diode src not in use; no polarity jumper.
none	25		41		x	x	4		4	4	NC (heater)	NC	33	63		sin2 pin 4 formerly wired to GRT readout 2 V, now disconnected.
none	40		40		w	w	20		20	20	NC (heater)	NC	33	64		sin2 pin 20 formerly wired to GRT readout 2 V, now disconnected.
array diode	37		37		t	t	5		5	5	NC (heater)	5	35	67	32	sin2 pin 5 connected via jumper to sin3.
array diode	36		36		s	s	21		21	21	NC (heater)	21	35	68	32	sin2 pin 21 connected via jumper to sin3.
none	21		33		p	p	6		6	6	NC	NC	53			no jumper from sin2 to sin3.
none	20		32		n	n	22		22	22	NC	NC	53			no jumper from sin2 to sin3.
none	50		29		j	j	7		7	7	NC	NC	51			no jumper from sin2 to sin3.
none	49		28		i	i	23		23	23	NC	NC	51			no jumper from sin2 to sin3.
IC GRT I-	46		25		f	f	8		8	8	GRT readout 2 I	NC	38	79		
IC GRT I+	45		24		e	e	24		24	24	GRT readout 2 I	NC	38	80		
none	24		21		b	b	9		9	9	diode src 5	NC	40	83		sin2 pin 9 connected to driven ground. Diode src not in use; no polarity jumper.
broken	42		20		a	a	25		25	25	diode src 5	25	40	84		sin2 pin 25 connected through 100Ω. Diode src not in use; no polarity jumper.
Array GRT I-	44		23		d	d	10		10	10	GRT readout 1 I	10	39	81		
Array GRT I+	43		22		c	c	26		26	26	GRT readout 1 I	26	39	82		
none	48		27		h	h	11		11	11	NC	NC	37	93		no jumper from sin2 to sin3.
none	47		26		g	g	27		27	27	NC	NC	37	94		no jumper from sin2 to sin3.
none	19		31		m	m	12		12	12	NC	NC	52			no jumper from sin2 to sin3.
none	51		30		k	k	28		28	28	NC	NC	52			no jumper from sin2 to sin3.
broken	23		35		r	r	13		13	13	diode src 7	NC	36	69		sin2 pin 13 connected to driven ground.
broken	22		34		q	q	29		29	29	diode src 7	29	36	70		sin2 pin 29 connected through 100Ω.
array diode	39		39		v	v	14		14	14	diode src 8	NC	34	65	23	sin2 pin 14 connected to driven ground.
array diode	38		38		u	u	30		30	30	diode src 8	30	34	66	23	sin2 pin 30 connected through 100Ω.
Fridge base diode	27		43		z	z	15		15	15	NC (heater)	15	32	61	21	sin2 pin 15 connected via jumper to sin3.
Fridge base diode	26		42		y	y	31		31	31	NC (heater)	31	32	62	21	sin2 pin 31 connected via jumper to sin3.
Fridge base diode	31		47		DD	DD	16		16	16	NC	NC	30	57		no jumper from sin2 to sin3.
Fridge base diode	30		46		CC	CC	32		32	32	NC	NC	30	58		no jumper from sin2 to sin3.
broken	35		51		HH	HH	17		17	17	NC	NC	28			no jumper from sin2 to sin3.
broken	34		50		GG	GG	33		33	33	NC	NC	28			no jumper from sin2 to sin3.
broken	16		16		X	X	36		36	36	diode src 2	36	42	87		sin2 pin 36 connected to driven ground.
none	15		15		W	W	35		35	35	diode src 2	35	42	88		sin2 pin 35 connected through 100Ω.
IC heater	12		12		T	T	38		38	38	NC (heater)	38	49			sin2 pin 38 connected via jumper to sin3.
IC heater	11		11		S	S	37		37	37	NC (heater)	37	49			sin2 pin 37 connected via jumper to sin3.
IC diode	8		8		N	N	40		40	40	diode src 4	40	43	95	53	sin2 pin 40 connected to driven ground.
IC diode	7		7		M	M	39		39	39	diode src 4	39	43	96	53	sin2 pin 39 connected through 100Ω.
Array GRT V-	4		4		J	J	42		42	42	GRT readout 1 V	42	45	99	55	sin2 pin 42 sees amplified resistor voltage.
Array GRT V+	3		3		H	H	41		41	41	GRT readout 1 V	41	45	100	55	sin2 pin 41 sees amplified resistor voltage.
IC GRT V-	6		6		L	L	44		44	44	GRT readout 2 V (HW	44	44	97	54	sin2 pin 44 sees amplified resistor voltage.
IC GRT V+	5		5		K	K	43		43	43	GRT readout 2 V (HW	43	44	98	54	sin2 pin 43 sees amplified resistor voltage.
none	10		10		R	R	46		46	46	NC	NC	48			no jumper from sin2 to sin3.
none	9		9		P	P	45		45	45	NC	NC	48			no jumper from sin2 to sin3.
array heater	14		14		V	V	48		48	47	NC (heater)	47	50			sin2 pin 47 connected via jumper. Note the pair flip.
array heater	13		13		U	U	47		47	48	NC (heater)	48	50			sin2 pin 48 connected via jumper. Note the pair flip.
broken	18		18		Z	Z	50		50	50	NC	NC	41	85		no jumper from sin2 to sin3.
broken	17		17		Y	Y	49		49	49	NC	NC	41	86		no jumper from sin2 to sin3.

Notes:
1) AUX side RF feedthrough was miswired, which is why pinout is not straight through
2) HW = hand-wired jumper used
3) since diode src mapping to sin2 will depend on polarity jumper setting, pins on sin2 may be swapped
4) NC (heater) vs. NC: NC (heater) are connected to both sin2 and sin3 while NC are connected only to sin3. This will affect whether the lines can be used for heaters when the output cable is connected to sin2.
5) BNC mapping is to pins of DB50 connector; what is connected will depend on whether the cable is is connected to sin2 or sin3
6) Mapping to SCB100 and PCI6031 have been checked for all signals that are digitized. NOTE: PCI6031E is set up to use 32 channels in differential mode. These channel numbers are 0-7, 16-23, 32-39, 48-55; i.e., skip every other 8! In single-ended mode, one would be able to address all 64 channels.

2002/11/30 SG Based on old docs, checked everything from thermometers through sin2/sin3 explicitly
2004/03/05 SG Checked mapping to SCB100 and PCI6031 for all signals that are digitized.
2004/03/19 SG Correct PCI6031E channel mapping for above funny readout numbering scheme.
2004/10/20 SG Array diode PCI6031E channel number was wrong.