3-30-99

CDL SIS Group — Job List

ARK – 30 Mar 99

* = under way

MMA test receiver support: (ref. Meeting with GGM, 22 Feb 99)

90-115 GHz Type-D SIS mixers	2 by 6-99 -- SKP/DK
B/S drives	2 by 6-99
Backshorts	2 by 6-99 << OK -- have plenty
210-270 GHz SIS373 or 4 mixers	3 by 9-99 -- HIA(Canada)
90-115 GHz LO couplers	2 by 6-99 -- ARK
210-270 GHz LO couplers	2 by 9-99 -- ARK
90-115 GHz Windows	4 by 9-99 -- DK
210-270 GHz Windows	3 by 11-99 -- DK
4-6 GHz HFET Amplifiers	6 by 6-99 -- WW/GP
<Bias Tees, 4-6 GHz (6 wire)	6 by 6-99 << will be made in Tuc.
36-40 GHz HFET Amplifiers	5 by 7-99 WW/GP
86-115 GHz HFET Amplifiers	3 by 8-99 WL/MP/GP

SIS mixer development

*BM371 balanced mixer development (UVA): -- ARK/SKP

*SIS374 building block mixer (SUNY): -- ARK

BSSM371 balanced sideband-separating mixer: -- ARK

*SIS141 600-720 GHz building block mixer: -- SKP

BM141 600-720 GHz balanced mixer: -- SKP

BSSM141(???) 600-720 GHz balanced sideband-separating mixer: -- SKP

Mixer design software:

Evaluate SuperMix, and compare with our present software -- SKP

Nb test circuits:

* New I/R Labs Dewar instrumentation -- SKP/KC/DK
* 75-110 GHz -- ARK

200-300 GHz -- ??

600-720 GHz -- SKP

SIS mixer sales

Peter Timbie may want two 150 GHz two-tuner mixers (for SSB operation), IF amps (??) and bias-T's (??). We can probably do this in the first quarter of '99 if Peter will do the testing. He is not sure yet -- will let us know.

Test equipment

Second 4K mixer test station: -- KC/nt1

Instrumentation for automated mixer measurements:

All bands:

* Computer control, interface, & data collection -- JE
Motorize all tuners -- Gunns, (multipliers), LO attenuators -- JE
4-12 GHz IF -- SKP/GE
4K plate -- SKP/GE
Switch (Radiall?) << prototype under test -- NH
Heatsink magnet plates -- NH
Balanced amplifier
Evaluate Miteq amp. at 4K
Coupler
Pads

* Room temp. plate -- SKP/KC
Control box & sq-law detector
RF Hot/Cold loads & switch/chopper

200-300 GHz LO
200-300 GHz Sideband source (harmonic generator + lookup tables)
600-720 GHz LO -- GE
600-720 GHz Sideband source -- GE
Optics -- GE
Horn
Lens
IR filter

IF matters

4-12 GHz IF schemes for SIS mixers:

Discrete component amps -- MP
MMIC amps -- SW

* Investigate current amplifiers (GG input stage) -- ARK/SW

SIS bias circuit design for MMA: -- GE
Evaluate Toko chip inductors for use in 4K bias-T's -- GE

Mixer/IF integration: -- GE
Bias circuit
Thermal design
Mixer block modifications

Choice of cryogenic connectors: -- DK

*Cryogenic IF switch development/evaluation: -- ARK/NH/JE

Windows

12-m telescope support:

Vacuum windows -- DK

80-115 GHz 4 by 8/1/99 for new 4-beam Rx.
68-90 GHz 2 by 7/1/99
90-116 GHz 2 by 7/1/99
130-180 GHz 2 by 7/1/99
200-265 GHz 4 by 10/1/99
260-300 GHz 4 by 11/1/99

Xtal quartz vacuum windows:

* 5-layer design -- ARK/DK
Assembly technique -- DK

Window & material measurements:

Fourier Transform Spectrometer
* Explore alternatives -- GE
Measurements of windows, IR filters, and absorbers -- GE/DK

W/G vacuum window improvements: -- ??

*Install RA7957 plugs in all outgoing mixers: -- NH

Microfabrication

Mixer fabrication techniques:

? Wafer thinning by surface grinder -- NH
* Wafer thinning by etching -- AWL(UVA)
* Slot machining, form tools -- ARK/AM
* Explore re-entrant dicing of quartz wafers -- NH
* Dicing saw acquisition -- NH
Used μ-Automation dicing saws (& repairs) -- NH

Miscellaneous

*Recruiting: -- JE et al.

*Design of w/g quad hybrid: -- ARK

*Photomixer LO development: -- ARK/Tuc/UCLA