

Wife

FM Advantages

- * Links many products, most info readily
 - * Survival: Drop of Electron market
 - * Enables optimization of velocity and pressure sensitivity of keypad
 - * " " " " breath control
 - * Collab. w. John C + S. M. Molas benefit
 - * First really "modern" electronic inst. Universally acknowledged. Excel patent position v. important

History

\$10/unit. NGK still would have gone forward.

so didn't make lawyer's argument (contract is contract)

We should scale ~~the~~ reward to N6/8 scores

\$900K cap avoids such mutual benefit.

Conditions changed, lower priced units being made than expected.

We also had, CPI adjustment to £10 - (out £ against reflation)

* After patients improve, NGR will continue to benefit

Opb.v

Chip set sells for \$15-20? Cost ~ \$3.00? (\$150 each)

Second source (so get higher %o. Perhaps amount, NOK
pays + 1/2 of Δ over that)

The higher volume, the greater profit to N&K.

Shoichi Saka, Pres. of Toshiba. Example of
Toshiba ↔ LSI Logic deal (as well as with Intel,
Motorola + Zilog)

MITI 10 year plan: Japan as technology exporter
Has NGK investigated Cassio products.

Royalty Reports - Applications of credits 4/84 report
(Sally could explain but she's not here!)

50 objectives

- #1. Continue harmonious & mutually beneficial relationships w. NOK
 - 2. Receive most funds poss. for JV research & education
 - 3. Assist ftr to us company

11/4/86

Unique FM Advantages (1, 2, 3, 4, 5)

- Velocity sensitivity in continuous relationship to significant spectral change (and process of pitch)
- Harmonicity/Inharmonicity continuous
- Key scaling, band limited signal
- Linkage

"NEK Division" comments were ceiling should be lowered in view of unlicensed competition.

11/5/87

ASP of MI ¥61,000 $\div 381 \times 0.5\% = ¥1.90$
(from Mr. Kamo)

Note: Get JC to produce disclosure for harmonic improvement.

Mr. Ishimura: Now resp. for LSI. Began to sell chips in 1982 outside NEK.

- ① Uses standard cells vs gate array. custom LSI.
- ② Dev. graphics chip, also has CD chips. MSX chip for portable computer. Microsoft & NEK collab. on graphics chip
- ③ Sound chip. to major PC mfgs & arcade game co in US (Atari & Williams), NEC, Fujitsu, Sharp. NEC using FET chip primarily in 8 bit PC, not their 16 bit business machines & Sega (Japan arcade game co)

Business planning, market & promoted.
Atari PC uses other sound chips.

FET chip too expensive for PCs in general.

NEK developed FM chip for NTT "Captain" system, which is Japan Video Tex. But Captain is now dead?

No license (cont'd)

11/5/84
86?

What does standard consideration of sound capability in
electronics. ~~Conclusion~~: not significant market at present.

NGK approached Apple re sound chip (Advanced Technology
Group) but were unsuccessful.

JC to Tokyo tonite (11/5/85). 11/6 evening to stay
at NGK ryokan. 10 mat + 8 mat room. Chassis
chairs to come also.

We offered to be accommodating in respect of royalty fix
among MI, LSI + cartridge: key to us is total royalty.

NR suggested NGK pay royalty beyond end of patent if
raising ceiling ~~is~~ a deal breaker.

We asked reaction to licensing US company w. Full
power chip set. (No response)

NR to black board. FPLSI = Full power LSI

US Patent Excl Period Options

1. No change. (SO license of 09 4/19/87)

or 2. NGK retain excl. until patent expire, but agree to sublicense US
Mfg of MI.

or 3. " " agree to sublicense US
Mfg of FPLSI

or 4. " " no restriction

Japan Excl. Period Options

(+Europe)

1. No change (excl. ends 1/30/91)

or ② Full excl until patent expiry w. no restrictions

SU ProposalNGK's Response

US patent: option 2 or 3

?

option 1

Japan's patent: option 2
or 3

?

option 1

Payment sched: OK

OK

OK

Terms: Remove ceiling

?

No

SSU ? To

?

LSI ? To

?

Divisions don't want to pay more (higher ceiling) in exchange for exclusivity. However, Patent Dept. would like excl.; otherwise, they will have to enforce their improvement patents vs SU licensees. 1.5 & 3.0

7 AM Thurs.

Mr. K. "Divisions" opinions

11/6/86

- FM value declining. Alternative & better ways developed.
- AWM of NGK. PD of Casio. Now in production.
- Other tone synthesis technology also
- Casio's PD system very competitive w. NGK
- FM patent not enforceable vs PD, although studies going on.
 - Casio pays no royalty. (It so could stop PD, no ceiling!)
- If FM royalties too high, they divisions will go to AWM or other systems not requiring royalty.

Merits of exclusiveness - worldwide

- If FM licensed to others, not easy for them to make FM instruments in view of NGK patents.
- If exclusiveness not assured to NGK, NGK encouraged to use other technology.
- If other cos. licensed, could not sue for excep. NGK would have used.
- If exclusive lost, & 3rd parties come in, transfer in patent rights in a timely fashion.

5000 ft. Englewood, Colorado, U.S.A.

- ~~Admission of new members~~ if there is no change in the
• ~~Admission of new members~~ if there is no change in the
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 - 350 1.25%
 - 151 2.50%

} NGK
proposals

2% is 10% of total royalties

Majority is European

Majority is electronic
Domestic : DX has 4.8% of market

Expect: DX has 7.3%

15 hours 12-8 '90

May - Oct - Sales volume declined. Slowdown of
PCs & software
Expect income

70-80% of PC cells Nov-Jan

Note strategy -

Sals never PC & gamma. Hope to expand to

- Telephones (music on "hold"). Now in development. But very price sensitive. Demergulation of telephone industry in Japan creates market.
 - Teletext market. on TVs. Would have sound function also. TVs would need own sound generation. By 1988, in view of Seoul Olympics.
 - PC - sound option. May be small

* sound & east in code, no room in spectrum to add AM/FM signal.

11/2/86

Not realistic for 2nd source, as software support
(expertise in sound) is critical to sell it.

Also volume too small

need at least 16 million/fcc in 1st yr.

Thinks Amiga buys chip from Texas Instruments, who has
outside manufacturer make it.

Amiga has good sound chips. MOS technology makes
for Commodore.

But Atari is poss. for FM, need buy NCR non-FM chips.

US sales will be prioritized. 3 people

2nd 6 mos fact \rightarrow Mar/Apr sales measured over least see
its seasonal effect.

Consider contract clause for LSI's:

where volume of LSI model > X units/mo, then
NCR agrees to seek 2nd source.

I. considers, then, 2nd source good business also.

In 1973 - NCR began US mfg. Value added
must be $> 50\%$. (Also reason to develop
product for US tastes). Knock down units.

NR: 55U 2%

LSI 3.5% but 3.0% if 2nd source agreed upon

55U resp. of Suzuki and ~~Shimura~~ Shimura

Mr. K. re 55U royalty: That, w/ 170 as is was reasonable

\ new 55U is beyond considered to be almost
SSI but for keyboard. Perhaps $\sim 70\%$ of
DX-7... 1% too high

∴ NR agreed to compromise 55U @ 1.5%

+ LSI @ 3.0% w. 2nd source clause.

NKR: we can not have a conflict of interest if we do not
on a country.

(1) No practical effect because of many NGK
patients, which could prevent use of SO
EMT patients

(2) Raise ceiling

When 1/2 million/months, then NGK agrees to seek
2nd source.

Send ^{OTL} FAX number to Mr. Kamo

NGK Patent Dept Fax # is: 81-534-56-8886

Concern - Mr. K. & Mr. R. many years.

Mfg w. Mr. Higoshi. 1000 engineers 7 years to commercialize
FM, (150 engineers for 7 yrs). \$38M in R&D

* When Mr. H & Hirokatsu neg. @ \$0 for \$900K ceiling, we
under order to \$900K. if sold separately

To me synthesis royalty is 5%, for total of 0.5%.
Designers will avoid costly circuit if royalty high. But
Managers would like to continue FM because investment of \$38M

Rationale for full excl. is ~~to~~ for me to
encourage engineers to maximize use of FM so
that \$900K level can be maintained.

Became NGK stuck to FM, Roland + Casio developed
new piano tones & lost market.

Mr. H. NGK could agree to clause specifying best efforts

* It was Mr. H & Kato that made sacrifice to \$900K.

If excl. continued, then Pres. of NGK + Directors will be relieved
of anxiety and can encourage designers to use FM, telling designs
no more \$400 if they use.

, During the Term of this Agreement

11/6/86

Use of FM Technology

GRANTEE agrees to make its best efforts to use ~~FM technology~~ tone synthesis techniques or patents in musical instruments ~~in~~ when such techniques are equal to, or better than, ~~tones of~~ ~~products which~~ alternative ~~and~~ tone synthesis techniques that are now, or will become, available to GRANTEE.

US Manufacture or Sublicense

GRANTEE IF ~~during the Term of this~~
Agreement ~~is a US company~~ - GRANTEE is approached
by a US company seeking to manufacture ~~its~~ products
~~in the US~~ using ~~#~~ techniques of U.S. patent No. 4,018,121,
then GRANTEE agrees to sublicense such company,
~~use~~ such ^{US} patent, under reasonable terms and
pursuant to Section 22 Sublicensing of this Agreement.
GRANTEE is not obligated ~~to sublicense more than~~
~~one company nor is GRANTEE obligated to license~~
~~is independently owned patents to the company nor to~~
~~obtain its sublicense rights to US Patent 4,018,121~~
~~sublicense more than one company.~~

Second Sourcing of Semiconductor Integrated Circuits

~~If during the Term of this Agreement, the manufacturing~~
~~volume of a ^{single model} semiconductor integrated circuit (~~described as~~~~
~~covered in Section 6.16 of this Agreement) ~~exceeds~~~~
~~units per month, then GRANTEE agrees to seek~~
~~a US company as a second source manufacturer of~~
~~such model.~~

11/6/86

Use of GRANTOR Patents

EXCEPT in cases where desired tones cannot be produced by techniques of Patents, GRANTEE agrees to use tone synthesis techniques of Patents in Musical Instruments when such techniques produce tones which are equal to, or better than, tones of alternative tone synthesis techniques that are now, or will be in the future, available to GRANTEE, and when such alternative tone synthesis subsystems is at similar or higher manufacturing cost.

Annual Review of Fairness

Mr. Nakada - person responsible (under Hiyoshi) for Clavinova

FM file up; i.e., if ~~existing~~ FM not used by NGA, & perhaps royalties go < \$100K, then \$10