

FM SOUND ROYALTY CHART					COMMENTS
PRODUCT	EARNED ROYALTY 1984	EARNED ROYALTY 1985	EARNED ROYALTY 1986	EARNED ROYALTY 1987 & After	
(1) Electronic Musical Instruments	0.5	0.5	0.5	0.5	As currently Agreed
(2) Subsystems (Cartridge)	0.75	0.75	1.0	TBD (3)	Renegotiate in 1987
(2) LSI	1.25	1.50	2.0	TBD (3)	Renegotiate in 1987

NOTES:

- (1) MAXIMUM of 900K/Year & 250K MINIMUM thru 1987
- (2) NO MAXIMUM OR MINIMUMS
- (3) TO BE (MUTUALLY) DETERMINED

[illegible]

YAMAHA MARKET DATA

- PIANO business is ²⁵30% of NGK
- ORGAN market share is 70% in JAPAN & greater than 50% worldwide
 - 1975 250K units U.S.
 - 1982 100K units U.S.
 - Constant decline in organ market.
- SYNTHESIZERS and CPU market are growth areas
- GROSS sales for ELECTRIC ORGAN and PIANO is \$250M (NGK \$2.5 billion)
- CHIP volume in 1985 - 0.5M to 1M units
- CARTRIDGE volume in 1985 - 200K to 400K units
- COMPETITORS (Product Literature Available)
 - VICTOR
 - SEIKO
 - ROLAND
 - CASIO
 - KORG

TECHNOLOGY NEEDS

- SIGNAL PROCESSING: reverberation & delay for audio
- very interested in any custom chips such as speech (which are ^{niche} ~~pitch~~ markets)
- may propose limited terms option in Japan on DIGITAR
- SOFTWARE CAD - SUPREM III, SEDAN II, SUPRA, GEMINI, SOAP, T.V. & SUXES (2 \$15K)
- HOME CPU uses T.I video processor \$7-9 (9918) (need better chip)

FM SOUND

1. ORGAN - will use two different chip sets
2. SYNTHESIZER - will use one chip set (probably same as low end ORGAN)
3. MSX (home CPU) - one chip set, only 8 voices and will both sell, and OEM FM SOUND CARTRIDGE
4. FM LSI CHIP - 3 or 4 voices, direct sales (CMOS)
5. LSI INFORMATION:
 - FM Sound Chip
 - 1) 8 x 7
 - 2) 4 x 3
 - 3 MICRON ~~2~~ NMOS (plastic package)
~~also~~ using SITL technology

TOTAL LSI FACTORY VOLUME (including FM LSI):

- 0.5M chips per month (30-40 different chips)
(expected to double every year)
- 12-15 chips in development
- Developed 7 custom chips in 3 months (6 gateways ^{may} & 1 custom SITL)
- Started LSI facilities about 12 years ago.