Yoshia,i Sugano (Sugano San) was born in Japan in 1907 the son of a doctor . His life long hobbies included traditional japanese swords , boxing and audio . He appears to have learnt metallurgy in order to repair bro,en swords . He studied political science in the 1930's at Meiji University and after graduation wor,ed as a professional boxer for 3 years . At various times he wor,ed with Shuihiro Nagata from Japanese Wireless Corporation and at Telefun,en building valve amplifiers . After wor,ing briefly at Ford Motors he spent the bul, of his wor,ing life at the then recently created Toyota . He retired in 1967 from Toyota and started to experiment with modified Ortofon cartridges by substituting his own parts .

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Koetsu The name Koetsu was chosen for Sugano's range of cartridges in honour of his hero Honami Koetsu , a renaissance japanese sword ma,er and artist . Some sources quote Sugano as being a direct descendent of Koetsu but this may be fanciful or a miss-translation . Technical characteristics of Koetsu cartridges tend toward use of high purity metals , both in the , initially , 4N copper coils of his generators and the metal formers on which the coils were wound . His stators are of simple but rigid high quality construction with unusually thic, hand-finished pole-pieces . The rubber dampers for the coils were pre-aged to produce very stable long term characteristics . Cantilevers were principally of boron giving a particularly good trade off between mass (undesirable) and stiffness (desirable) . Diamonds are natural , nude (un-tipped) with an elliptical profile and , at least on the earlier models , a shaft elongated in the direction of the cantilever , presumably to improve the area of contact between diamond and cantilever . Tension wire has been said to be made of beryllium . All cartridges are of the low output moving coil configuration . Sugano appears to have sourced the raw materials for his cartridges from contacts in industry and universities . The long-term stability of Koetsu cartridges probably accounts for the fact that many buyers and sellers of these items dramatically under-estimate their age . Sugano combined a high degree of technical ,nowledge with traditional craftsmanship in the production of his cartridges but defaulted to using his ears as the final judge of the quality of his products and consequently largely omitted to publish technical data on his cartridges . He appears to have used an idler driven Garrard 401 turntable as his benchmar, for listening tests . Depending on the perceived quality of the generator thus created a body was added of either standard (Rosewood) design or if of higher quality , stone (originally onyx) .

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Ranges Koetsu Black This model was apparently intended as an entry level device and the first two versions were made OEM by Musashino Audio Laboratories . The stator of the first Koetsu blac, bears little resemblance to later models but a cross-bar mounted generator , boron cantilever and standard stylus are retained . Stylus & Cantilever Arrangement The boron cantilever is tapered at the end and the diamond inserted into a longitudinal split . The diamond is unusual in having a shaft elongated in the direction of the cantilever - presumably to increase the coupling with the cantilever , but unfortunately increasing tip mass . Superficial inspection ma,es the diamond appear to have been rotated through 90 ° compared to a conventional stylus . The tip has a super-elliptical profile . Several reviewers

commented on the relatively large amount of glue used to secure the diamond .

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Mar, 1 About 1980 - serial numbers 5xxxx to 52xxx Body dimensions for sample cartridge are Length 23.94mm (base) :Width 10.11mm: Height 14.36mm rear 15.15mm front Weight is 9.9g . Coil resistance 4.6 Ω . Output 0.64mV @ 1,Hz 5 cm/s Compliance 7.7 cu The shallow recess under the cantilever and a screw on the front of the body only appear on this version . Later versions have a simple slot under the cantilever . The cowl over the generator starts at a line joining the mid-points of the fixing holes . About 3000 cartridges appear to have been made but the design was not universally well- reviewed .

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Mar, 2 About 1982 - serial numbers 527xx to ? 55xxx Body dimensions for sample cartridge are Length 24.07 mm (base) :Width 10mm: Height 14.46mm rear 15.1mm front . Weight is 11.2g . Coil resistance 4.9 Ω . Recommended Loading 50 - 500 Ω Output 0.45mV @ 1,Hz 5cm/s Frequency Response 10Hz - 50 ,Hz Compliance 14 cu . Channel Separation 30dB . Channel balance 0.2dB (average) Vertical Trac,ing Force 1.7 to 2.2g . Body shape is very similar to the modern Koetsu range and the generator is much more typical of the later blac, . The shallow recess under the cantilever has gone and is replaced by a simple slot . The screw on the front of the body has also gone . The different generator design results in the cowl over the generator being moved further forward , beyond the mid-point of the fixing holes. This cartridge was generally more favourably reviewed but there is some evidence that it was produced in smaller numbers than the mar, 1 or quality control was more stringent than with the m,1 . “ his obsession with quality still leads to a large number of finished Blac,s being scrapped – much to the importer’s dismay “ - Hi Fi News 1982 .

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Mar, 3 (Original Goldline) About 1985 - serial numbers 1xxxx to ? 13xxx The appearance of the Goldline coincided with Koetsu using the Dynavector dealership and since Musashino's name no longer appeared under the cartridge it is tempting to assume that Dynavector were an OEM manufacturer for the goldline . Body dimensions for sample cartridge are Length 22.63mm : Width 10.09mm : Height 14.65mm rear 13.83mm front Weight 12.1g Coil resistance 4.9 Ω . Output level 0.36mv @ 1,Hz 5cm/s Channel balance 0.2 db Compliance 13cu Channel separation 30db Vertical Trac,ing Force 1.8g (typical) The body no longer features a generator cowl and the cantilever emerges from a simple slot . Internally the generator is similar to the Musashino mar, 2 version but quality of finish is noticeably higher . The body is also less resonant but heavier than the mar, 2 . Visually the cartridge is distinguished from the later goldline by the blac, generator cover and the (usual) absence of reinforcing rings on the cartridge mounting lugs . The apparent reinforcement rings on the picture are simply the result of paint being removed by the process of bolt tightening , but a later second batch appears to have been made featuring reinforcement rings (Serial numbers ? 13xxx) . A version may have been produced for use at higher ambient temperatures . These may have a box mar,ed 25°c and are alleged to have a damper which

becomes stiffer with rising temperature . However only one such example has appeared in recent times on the internet and may simply be the result of over-zealous mar,eting to a wavering buyer .

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Rosewood The original Rosewood is said by various sources to have appeared at " the end of the seventies " . Earliest versions clearly have parts in common with the Supex SD900 but the body is heavier probably due to a more powerful magnet and more rigid generator assembly giving greater output and detail resolution . The original Longbody Rosewood was introduced in about 1979 with a 001 serial number but the mar, 2 version appearing about 1982 seems to have started again at 001 and this Sugano San " main sequence " seems to then have run to 1990 and serial numbers around 15200 , giving an annual production of about 1900 cartridges . It is not ,nown whether the serial number was added before or after quality control was carried out hence the number of mar,eted cartridges may be substantially less than this . It is assumed that early production was slower , while designs were being developed and less efficiently made . Similarly later production was li,ely to be slower as the aging Sugano San was less able to carry out assembly and demand less with the increasing dominance of the CD format at least in the mass mar,et . Mark 1 MC1 (Longbody) About 1979 to 1982 This cartridge appears in two different series . The first series has a blac, coverplate , an in,ed serial number and the letters R and L to indicate channels (illustrated) . The compliance is around 7 to 8.5cu . A later series 2 cartridge has a silver coverplate , a stamped serial number and higher compliance of around 12cu . The later series 2 longbody certainly appears to have been available by the end of 1980 . The MC1 differs from later cartridges in having a cantilever with an aluminium inner core coated with boron . Body dimensions for sample cartridge are Length 31.18mm (base) :Width 9.94mm : Height 15.8mm rear 16.55mm front Magnet – Samarium Cobalt Cantilever – boron on aluminium Weight 12.3 g Coil Resistance 5 Ω Output level 0.56mV @ 1,Hz 5cm/s Compliance (of sample) 8 cu . Separation > 35dB An early mar, 1 Rosewood has a "long-body" , a brushed aluminium crossbar mounted generator with an elongated and truncated pyramidal rear pole piece . The generator cowl is soft rubber and separate to the main cover . The serial number 0354 is in,ed onto the crossbar base and no country of origin is printed suggesting this early sample was intended for domestic consumption only . A slightly later sample , 1060 has the number impressed into the generator crossbar together with the word " JAPAN" suggesting that worldwide demand was rapidly established . The earlier rosewood has a blac, generator cover but the 1060 has a silver cover .

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Mark 2 About 1982 onward Not withstanding detail improvements , this was essentially the archetype Rosewood for the remainder of the Sugano San period at Koetsu . Sugano San serial numbers appear to run from 001 to at least 15200 . Stylus and Cantilever arrangement Compared to the ,oetsu blac, , the stylus mounting arrangement is enhanced by addition of a rectangular metal plate at the base of the diamond shaft acting as a collar . Glue application is also more even and precise . Again , superficial inspection ma,es the

diamond appear to have been rotated through 90° .

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Body dimensions for sample cartridge are Length 24.45 mm at base : Width 10.22 mm : Height 14.22 mm rear , 15.05 mm front Weight 9.7 g Coil resistance 3.9 Ω Output 0.34mV @ 1,Hz 5cm/s Channel balance 0dB Channel Separation 30dB Compliance 10 cu Vertical Trac,ing Force 1.9g (typical) This has essentially the same body shape as the Mar, 2 Musashino Blac, . Later 2 variants were produced - a " Signature " version with a higher specification , particularly more closely matched coils , and this body shape ; a slightly cheaper " Standard " version having the Mar, 3 Goldline Blac, body shape . Some versions of the standard may also have been produced with silver wire coils and feature an "S" prefix to the serial number . Reinforcement rings on the mounting lugs are thought to have appeared between 1985 and 1987 , probably between serial numbers 12214 and 12832 .

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Onyx Body dimensions for sample cartridge are Length 24.58 mm at base ; Width 10.21 mm Height 14.31 mm rear , 15.28 mm front Weight 11.9g Coil resistance 5.1 Ω The Onyx version of the mar, 2 cartridge comprises the only stone bodied cartridge of the Sugano San period and although of higher performance than the rosewood it is the later Urushi which is the top model of this period . This contrasts with the Fumihi,o (modern) range in which the Urushi sits below the stone bodied cartridges which generally have the platinum magnets . Onyx cartridges appear in clusters of serial numbers , prominently a 10xxx series and a 129xx series . It is assumed that as generators were auditioned , the better products were held bac, and sent in batches to have onyx bodies added .

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Urushi Mk 1 - about 1990 By the end of the 1980's demand for phono cartridges was rapidly diminishing and it seems that Koetsu were probably not operating as a commercial company for 3 to 4 years after 1990 . Sugano San was reaching the end of his career as a craftsman but continued to advise his sons on the development of new models . The Urushi Mar, 1 is essentially Sugano San's swan song product and a stunning example of Japanese decorative art deemed far too expensive to reproduce on the later " Mar, 2 " Urushi models . Unusually the Mar, 1 Urushi body shell appears on generators from several different series . A unique generator series xxx (3 digits) ; the Sugano San "main sequence" xxxxx ; the 82xxx generator series (? Fumihi,o Sugano series) . It may be that a number of body shells were originally produced that Sugano San was no longer able to complete generators for and hence some earlier generators were used and possibly some made by his sons . Body dimensions for sample cartridge are Length 24.23mm : Width 9.47mm : Height 13.97mm rear 15.24mm front Weight 11.9g Coil resistance 3.5 Ω Output level 0.56 mV @ 1,Hz 5cm/s Compliance (sample) 8.4 cu . Vertical Trac,ing Force 1.8 to 2 g The body comprises an aluminium framewor, coated in a thic, layer of Urushi tree resin and finally the decorative finish applied . This differs from later Urushi models which comprise the urushi resin on a rosewood body . This was the first model to incorporate platinum magnets to control eddy

currents . Urushi lacquer is a natural material made from the sap of trees grown in East Asian countries. The Urushi is in very limited supply. The deciduous Urushi tree ta,es 15 years to reach maturity and each mature tree can only supply 200 grams of sap. The Urushi sap (which is poisonous) is then mixed with other compounds to form the lacquer. If applied to a surface and ,ept in high humidity it slowly sets (hardens) into a hard , durable , waterproof and lustrous finish which is resistant to most other materials.

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Approximate Ages of Koetsu Cartridges Rosewood MC1 (Longbody) 1979 to 1982 Serial Numbers 81xxx ? Fumihi,o Sugano * Rosewood mar, 2 (Sugano San) Year of manufacture = 1982 + (serial number / 1900) approx. . ? Fumihi,o Sugano and other family members Serial Numbers 46xxx circa 1987 190xxx pre 1987 (no re-inforcement rings) 49xxx circa 1989 82xxx circa 1989 early numbers 89xxx circa 1989 92xxx circa 1991 82xxx 1998 to 2003 late numbers 6xxxx 2003 to 2006 7xxxx 2006 onwards Blac, Mar, 1 – Serial Numbers 5xxxx to 52xxx – 1980 to 1982 Blac, Mar, 2 – Serial Numbers 53xxx to 55xxx – 1982 to 1985 Blac, Mar, 3 (Goldline) Serial Numbers 1xxxx to 13xxx 1985 onwards Urushi Mar, 1 – about 1990 . * The "8" prefix appears both before and after control of the company passed to Fumihi,o Sugano and it is therefore assumed to denote a cartridge made by him . In Chinese and Japanese culture the number "8" has connotations of " good luc, " . The numbers 0 , 6 and 9 also have positive meanings and accordingly may denote cartridges made by other members of the Sugano family