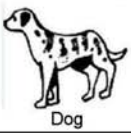
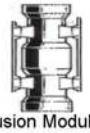
			Mass	Electric	Magnetic	Life	Thought
Range	VISION	HEARING	AWARENESS			PERCEPTION	
0 Contact	Not Possible						
(=1) R Reading 0.5 m	 Needle	 Whisper	 Coin			 Flea	
(=1) T Talking 1.5 m	the Printed Word	 Talking	 Cards			 Moth	
1 Vshort 5 m	 Coin	 Lecture	 Book	 Chips	 Magnet	 Bird	
2 Short 50 m	 Cards	 SHOUT	 Suitcase	 Low Energy Devices	 Pistol	 Rat	*Calm Life Processes*
3 Medium 150 m	 Book	 ! Distress	 Person	 Wiring	 Rifle	 Dog	*Complex Life Processes*
4 Long 500 m	 Suitcase	 ! ! ! Distress	 Truck	 Fusion Modules	 Metal Devices	 Man	*Simple Thought*
5 Vlong 1000 m	 Person	 Gunshot	 Building	 Generators	 Truck	 Bison	*Complex Thought*
6 Distant 5000 m	 Truck	 Thunder	Hills	Transmission Lines	Building	Hexaphant	*Strong Emotion*
Horizon							
7 Vdistant 50 km	Tower	Massive Explosion	Mountain	Lightning Strike		Leviathan	*Death Throes*
8 From Orbit 500 km	City	Not Possible		EMP		Forest	*Death Throes*
8 In Orbit 500 km		Not Possible		Massive EMP	Magnetic Field		*Death Throes*

The Senses

The senses feed information to a character. In most cases, the process is assumed and invisible to the players. In some cases, the use of the senses is resolved:

To resolve some sensory activities (as actions) where the result is uncertain.
To show the distinct sensory abilities of different sophonts.

The sense rules provide to players an understanding of what information they can readily find through their senses, as well as showing how likely they are to be successful. Can this character smell something strange on the wind? Can that character see some movement on the horizon? Can another character hear a faint conversation across a room? Each of these situations may happen in the course of an adventure and the outcome inevitably shapes the actions of the characters.

THE SENSES

A being perceives the environment through the senses. Each single sense concentrates on one specific phenomenon: there are six broad types of phenomena that the senses can perceive.

The six broad categories for senses are:

Energy. The detection of energy is **vision**. The energy detected is typically wavelengths of light (which may extend into the infrared or ultraviolet).

Vibration. The detection of vibration is **hearing**. The vibration detected is sound (which may be ordinary sound, infrasonic, or ultrasonic).

Matter. The detection of matter is **touch**. Touch involves contact with objects and sensing of patterns, textures, shapes, temperature, and other information.

Volatiles. The detection of chemical (or biochemical) volatiles is smell (in atmosphere); or taste (in solution; typically water). The two are treated as one sense.

Fields. The detection of fields is awareness. The fields detected are electrical or magnetic.

Auras. The detection of auras is perception. The auras detected are biological (and reflect the presence of life), or sentient (and reflect the presence of thought).

Other senses are certainly conceivable, but they are either minor in scope or too exotic in resolution for this system to handle. When they are present, they are administered as exceptions or through special rules.

THE SIX BASIC SENSES

Phenomenon	Sense	Detects	Organ
Energy	Vision	Light	Eyes
Vibration	Hearing	Sound	Ears
Volatiles	Smell	Chemicals in gases	Nose
	Taste	Chemicals in liquids	Mouth
Matter	Touch	Physical objects	Body
Fields	Awareness	Electrical Magnetic	Nerve Grid
Auras	Perception	Biological (Life) Sentient (Thought)	Brain

SENSE ACTIONS

The Senses are resolved as Actions (an Action is expressed like a Task, but no specific Skill is involved). Two types of Action are possible: At Range, and In Contact.

At Range. When senses operate at a distance (Vision, Hearing, Awareness, Perception), the Action takes account of Range by using D6 equal to the range number (Vshort=1, Short =2, etc and a range table is provided).

Resolving a Vision Action at Range=2 uses 2D.

In Contact. When senses operate in contact (Touch, Smell), range is ignored and the Action is based on 2D.

THE SENSORY ACTIONS

Energy Vision	*Vibration* Hearing	*Volatiles* Smell	*Matter* Touch	*Fields* Awareness	*Life/Thought* Perception
To Spot	To Notice	To Notice	To Notice	To Notice	To Notice
--	To Locate	--	--	To Locate	To Locate
To Identify	To Identify	To Identify	To Identify	To Orient	To Identify
To Track	To Track	To Follow	--	To Track	To Track

Spot (for Vision) or **Notice** (all others) indicates that the individual has picked out the sensory input and is able to further process it. Additional actions are not possible unless an input is spotted or noticed first.

Locate provides the individual with the location (direction and approximate distance) to the source.

Identify provides the individual with information about what the source is (for Hearing it also allows comprehension). **Orient** provides the individual with information about surroundings.

Track allows the individual to observe the source as it moves. **Follow** allows the individual to move toward the object.

THE REFEREE VERSUS THE CHARACTER

There are two important elements in the use of the senses:

Use the Senses Only When Necessary

Events become bogged down when every glance is resolved with Vision, or every noise is resolved with Hearing. Use the senses only when the ability to sense something is unclear or unusual.

Conceal The Input Until it Is Sensed

Techniques are available that allow the Referee to conceal what he knows.

The Referee. The Referee has perfect knowledge about the situation. He knows if there are soldiers lying in ambush, or faint markings on stone walls. Or, he knows that the present location is harmless.

The Players. The players have no readings from their senses to understand the situation. Some information is obvious: the referee should describe what they normally see or hear or sense. Other information may be uncertain, and the use of the senses is called for.

The Process. The Sense Process is the way characters investigate their surroundings.

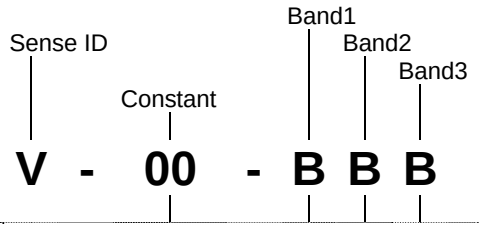
The Senses

The Sense Actions provide information about the environment.

The Senses
An Overview of Their Use

V =VISION

Human Vision Constant **16**

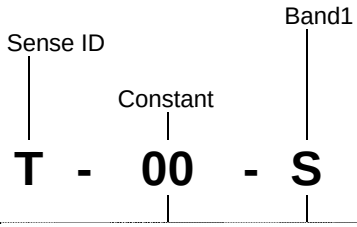


Human=	16	R	G	B

nD To Notice an Object
< Constant + Benchmark + Mod + Mod

T =TOUCH

Human Touch Constant **06**

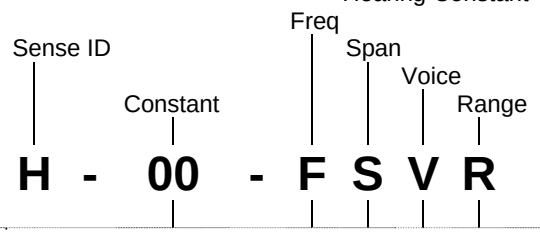


Human=	06	1

2D To Notice a Texture
< Constant + Benchmark + Mod + Mod

H =HEARING

Human Hearing Constant **16**

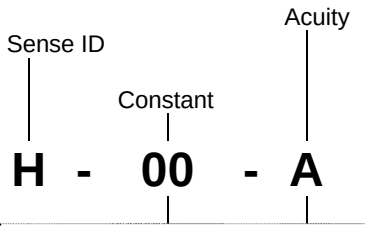


Human=	16	9	3	8	2

nD To Notice a Sound
< Constant + Benchmark + Mod + Mod

A =AWARENESS

Human Aware Constant **X**

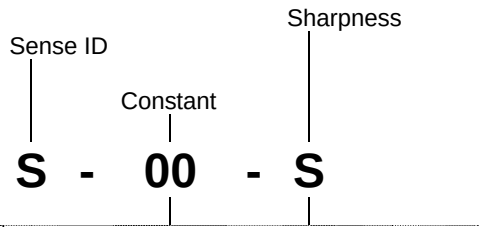


Human=

nD To Notice a Field
< Constant + Benchmark + Mod + Mod

S =SMELL

Human Smell Constant **10**

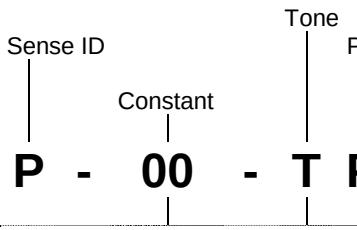


Human=	10	1

2D To Notice a Scent
< Constant + Benchmark + Mod + Mod

P = PERCEPTION

Human Perception Constant **X**



Human=

nD To Notice an Aura
< Constant + Benchmark + Mod + Mod

RANGES

Range=	0	1	2	3	4	5	6	7	8	9
Range	Contact	Vshort	Short	Medium	Long	Vlong	Distant	VDistant	Orbit	Far Orbit
Distance		5 m	50 m	150 m	500 m	1000 m	5000 m	50 km	500 km	5000 km

Range	VISION
0 Contact	Not Possible
R Reading 0.5 m	 Needle
T Talking 1.5 m	the Printed Word
1 Vshort 5 m	 Coin
2 Short 50 m	 Cards
3 Medium 150 m	 Book
4 Long 500 m	 Suitcase
5 Vlong 1000 m	 Person
6 Distant 5000 m	 Truck
Horizon	
7 Vdistant 50 km	 Tower
8 From Orbit 500 km	 City

Vision

Vision senses light (radiant energy). Photons emitted by, or reflected by, objects provide information about the objects.

Vision-1

UNDERSTANDING VISION

The sense organ for vision is the **eye**. It detects radiant energy and feeds it to a nerve system that processes the information. A sophont's eye is sensitive to a range of light wavelengths (bands) which correspond to colors.

A sophont with a sense of vision has **eyes** and can **see**. A sophont without the sense of vision is **blind**.

V =VISION — Human Vision Constant **16**

Sense ID	Constant	Band1	Band2	Band3
V -	00 -	B	B	B
Human=	16	R	G	B

nD To Notice an Object
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Vision. The Vision Constant for the Race (Human = 16). Higher numbers are better: a sophont with Vision 20 has better vision; one with Vision 12 has worse vision.

Benchmark. Object Size minus Range. If zero or less, the Action cannot be attempted.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE VISION CONCEPT

The Vision Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to see what he can ("I am scanning the horizon" or "I am looking around"), the referee resolves the Vision Action based on the Vision Constant, Range, Object Size, and other details.

Once an object is noticed, the character continues to see it until it moves out of range or somehow becomes hidden.

For example, human Eneri Dinsha V-16-RGB has landed his scoutship on a broad plain. He steps out and looks around. It is ordinary daytime.

There is a cargo mover Size=6 moving near the horizon Range=6.

Vision Constant = 16. Benchmark = Size minus Range = 6-6 = 0. Mod = +2 Vfast.

The referee hands the player 6D and says "Roll." He must roll 16 +0 + 2 = 18 or less on 6D to notice the cargo mover. He has about a 28% chance of seeing it.

Option1. Eneri rolls 12. The referee tells him: "There is a Cargo Mover out near the horizon, moving from left to right, appears to be moving quite fast.

Option2. Eneri rolls 21. The referee tells him: "The landscape looks fairly common. Some flats, a few rocks, some hills off in the distance." He's probably not looking very hard.

Eneri can go back inside because there's nothing to see.

Or he can keep looking and try again.

More About Vision

- Vision senses a variety of light wavelengths.

Vision-2

THE COLORS OF LIGHT

The Vision String identifies three adjacent Bands: named adjacent peak wavelengths corresponding to colors. Vision detectable wavelengths (defined in nm nanometers) range from the ultraviolet to the infrared across a spectrum of sixteen colors.

Humans see in RGB (Red-Green-Blue); others may see a spectrum which overlaps human vision (for example, PBG, or RCA), or a spectrum above or below the human range.

Subjective Color. A being "sees" a range of colors analogous to RGB. Someone with vision in the PSU (Purple-Sparkle-Uv) band "sees" P as Red, S as Green, and U as Blue).

Seeing Colors

Objects reflect (or radiate) many different colors; beings can only see the colors their eyes can sense. Colors convey information; beings seeing different wavelengths harvest different information from what they see.

Seeing White. A white object reflects all colors. A human seeing RGB sees a white object. A sophont seeing PSU also sees a white object.

Seeing Black. A black object reflects no colors. A human seeing RGB sees a black object. A sophont seeing PSU also sees a black object.

Seeing Heat. A sophont who sees in the InfraRed (any of the colors ANIFXZ) can see objects hotter than its body temperature as bright glowing ANIFXZ colors and those colder as dull grey or black regardless of light levels. In addition, the sophont can see ordinary objects in reflected ANIFXZ colors.

AN OVERVIEW OF COLORS

nm	Code	Name	Star	Extended Color Name
30	V	Vharduv	B0 I	Very Hard Ultra Violet.
100	H	Harduv	B0 V	Hard Ultra Violet.
170	D	Darkuv	B5 V	Dark Ultra Violet.
240	U	Uv	B9 V	Ultra Violet.
310	S	Sparkle	A2 V	Near Ultra Violet.
380	P	Purple	A9 V	Human visible Violet (almost ultraviolet).
450	B	Blue	F7 V	Human visual Blue.
540	G	Green	G2 V	Human visible Green.
610	R	Red	K1 V	Human visible Red.
680	C	Cerise	K4 V	Human visual Cerise (almost infrared)
750	A	Aglow	K7 V	Edge of infrared.
820	N	Nearir	M0 V	Near Infra Red
890	I	Ir	M2 V	Infra Red
1000	F	Farir	M5 V	Far Infra Red
2000	X	Xir	L9 VII	Extreme Infra Red
4000	Z	Zir	T7 VII	Beyond Extreme Infra Red

nm: the wavelength in nanometers (nm). The peak wavelength perceived; the eye actually sees wavelengths within 100 nm on either side of the peak (more in the Infrared). **Code.** The single letter abbreviation for this color.

Name. The name of this color. **Star.** Stellar spectral class with peak output at this wavelength. **Extended Color Name.** A description of this color.

IT'S MORE COMPLEX THAN THESE FEW STATEMENTS

The equivalence of colors across wavelengths is far more complex than these few statements. For role-playing purposes, a player can assume the equivalences for everyday usage can concentrate on the differences.

THE ADVANTAGES OF OTHER COLORS

A sophont with vision in the infrared can see heat: hotspots in machinery; body heat from animals or sophonts, even in the darkest night; heat traces left by vehicles.

A sophont with vision in the ultraviolet can see fluorescing minerals, chemicals left by organic activity.

Vision in other colors can often detect flaws, document alterations, or overpainting not visible to the original users.

THE DISADVANTAGES OF COLOR

Devices may show blank output: in colors invisible to the user.

Insignia, markings, color identifiers, warning signs, or alarms may be in invisible colors.

TECHNOLOGICAL VISION

Many devices depend on light input, produce light output, and operate to enhance vision.

A Vision device is identified with a Vision String and may include an enhanced Vision Constant, a Range Mod, and alternate color input and output.

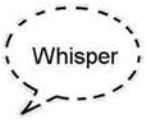
An unaided human V-16-RGB has a 40% chance of noticing a person Size = 5 at R=5.

Binox-10 V-20-VHD> RGB is a TL-10 vision enhancer seeing in the VHD range and outputting in human-visible RGB. Constant 20 increases the chance of success.

A human using Binox-10 V-20-VHD has a 78% chance of noticing a person Size = 5 at R=5.

Binox-12 V-16-RGB R-1 is a TL-12 vision enhancer seeing in the RGB range. R-1 reduces the applicable range band by 1.

A human using Binox-12 V-16-RGB BM+1 has a 40% chance of noticing a person Size=5 at Range=6 (resolved as R=5).

Range	HEARING
0 Contact	
R Reading 0.5 m	
T Talking 1.5 m	
1 Vshort 5 m	
2 Short 50 m	
3 Medium 150 m	
4 Long 500 m	
5 Vlong 1000 m	 Gunshot
6 Distant 5000 m	 Thunder
Horizon	
7 Vdistant 50 km	 Massive Explosion
8 From Orbit 500 km	Not Possible

Hearing

Hearing senses vibration of matter in atmosphere. The motion of objects induces vibration in atmospheric gases (or in water) and this vibration provides information about motion and location.

Hearing-1

UNDERSTANDING HEARING

The sense organ for hearing is the ear. It takes in vibration and feeds it to a nerve system that then processes the information. Typically, the ear is sensitive to a range of frequencies which correspond to sound pitch.

A sophont with the sense of hearing has **ears** and can **hear**. A sophont without the sense of hearing is **deaf**.

H =HEARING — Human Hearing Constant **16**

Sense ID	Constant	Freq	Span	Voice	Range
H -	00	- F	S	V	R
Human=	16	9	3	8	2

Sound Benchmarks

Earbud	-2
Whisper	-1
Talking	0
Lecture	+1
Shout	+2
Distress	+3
Distress Many	+4
Gunshot	+5
Thunder	+6
Explosion	+7

nD To Notice a Sound < Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range. Treat Range=R and Range=T as Range=1.

Hearing. The Hearing Constant for the Race (Human = 16). Higher numbers are better; a sophont with Hearing 20 has better hearing; one with Hearing 12 has worse hearing.

Benchmark. Sound Intensity minus Range. A benchmark less than zero can still be attempted.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE HEARING CONCEPT

The Hearing Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to hear what he can ("I am listening" or "I am trying to hear any unusual noises"), the referee resolves the Hearing Action based on the Hearing Constant, Range, Object Size, and other details.

The referee may also introduce information (when an unusual sound happens, he gives the player an opportunity to hear it through the Hearing Action).

Once a sound is noticed, the character continues to hear it until it ends.

For example, human Eneri Dinsha H-16-9382 is relaxing in the Lone Star with his friends. They notice two uniformed human naval officers talking to each other. Eneri's friend whispers "Sh! Listen to those officers. Can you hear what they are saying?"

The officers are Talking. Their table is close by: Range=1.

Hearing Constant= 16. Benchmark = Sound minus Range = 0 - 1 = -1. The room isn't crowded, and relatively quiet. Mod= 0. He must roll 16 -1 = 15 or less on 1D to listen to the conversation. He rolls 6. After a while, the officers notice and stop talking.

Or, the room is crowded and noisy. Background Noise Mod= -12. He must roll 16-1-12 = 3 or less on 1D. He rolls 5, and can't make out anything.

Outside, it starts to rain.

There is a clap of thunder about a kilometer away. Hearing Constant= 16. Benchmark = Sound Minus Range = 6 - 5 = +1. The Lone Star has background noise = -3.

The player rolls 5D. He must roll 16 +1 -3 or less on 5 D. He rolls 22 and doesn't notice the noise outside.

Later they step outside and notice its raining. There's another clap of thunder. It's obvious; there's no need to roll. They hear the thunder.

More About Hearing

Hearing senses sound frequencies.

Hearing-2

THE FREQUENCIES OF SOUND

The Hearing String identifies the sound frequencies (pitch) which a sophont can hear, and the sound frequencies of the sophont voice.

F Freq. The central frequency the ear can hear in Hertz (= cycles per second). F is a power of 2 (so, if F=8, Freq = 2^8 = 256). The difference between any two Freq values is an Octave.

S Span. The number of Octaves above and below Freq. If S=1, then the span of sound the sophont can hear is one octave above and below Freq.

V Voice. The central frequency of the voice in Hertz.

R Range. The number of Octaves above and below Voice.

THE FREQUENCIES OF SOUND

Flux	Code	Freq (Hz)	Formula		Description
-9	1	2	2^ 1	C d	delta
-8	2	4	2^ 2	C th	theta
-7	3	8	2^ 3	C a	alpha
-6	4	16	2^ 4	C 0	beta
-5	5	32	2^ 5	C 1	gamma
-4	6	64	2^ 6	C 2	Low human audible.
-3	7	128	2^ 7	C 3	
-2	8	256	2^ 8	C 4	Middle C
-1	9	512	2^ 9	C 5	
0	A	1,000	2^10	C 6	
+1	B	2,000	2^11	C 7	
+2	C	4,000	2^12	C 8	High human audible.
+3	D	8,000	2^13	C 9	
+4	E	16,000	2^14	C10	Dog whistle
+5	F	32,000	2^15	C11	
+6	G	64,000	2^16	C12	
+7	H	128,000	2^17	C13	
+8	J	256,000	2^18	C14	
+9	K	524,288	2^19	C15	

Pitch is sound frequency (in Hertz; in cycles per second). Each increase in pitch is twice the frequency of the previous level and equals one octave.

Calculating What Sounds Can Be Heard

Human Hearing is H-16-9392.

Frequency =9. Human hearing is centered on Frequency =9 = 2^9 cycles per second = 512 hertz. This corresponds to C5 on the Musical Pitch Chart.

Span = 3. Human hearing extends 3 octaves above and below the central Frequency. A human can hear sounds from 2^6 (= 64) Hz to 2^12 (= 4000) Hz.

Voice= 9. The human voice is centered on Voice= 9 = 2^9 cycles per second = 512 hertz. This corresponds to C5 on the Musical Pitch Chart (the Human male voice is one octave lower).

Range = 2. The human voice extends 2 octaves above and below the central Voice frequency. A human can make sounds from 2^7 (= 128) Hz to 2^11 (= 2000) Hz. The Human Male is about one octave lower.

SPECIAL SOUNDS

Some frequencies of sound have additional effects outside of the sense of hearing (they have no effect on sophonts who hear the Frequency naturally).

F=1. Delta Waves. Induces or promotes sleep. After 5 minutes of exposure, Check C3: Failure = Character falls asleep for 1D minutes the first time; 1D hours the second time.

F=2. Theta Waves. Induces hypnotic or trance suggestive states. After 5 minutes, a Personal against the subject may include Mod = Good Flux.

F3. Apha Waves. Induces relaxation states. After 5 minutes, the subject is Sleepy.

F=4. Beta Waves. Induces alertness. After 1 minute of exposure, subject is Ordinary for 1 hour, followed by a return to previous attention level.

Many alarms include output at F=4 (overuse checks San).

F=5. Gamma Waves. Induces heightened productivity. After 5 minutes, subject is Optimal for 1 hour, followed by a return to previous attention level.

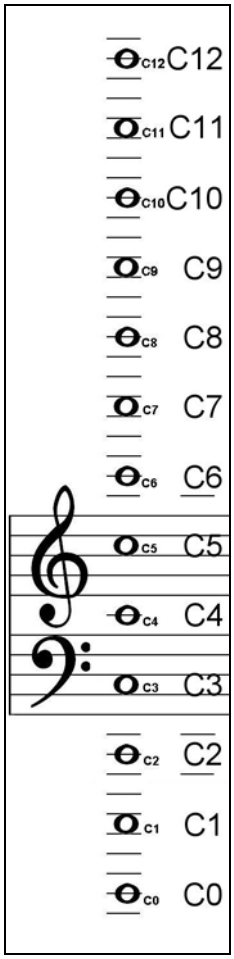
TECHNOLOGICAL HEARING

Many devices input, process, and output sound. A Hearing Device is identified with a Hearing String and may include an enhanced Hearing Constant, a Rang Mod, and alternate sound input and output.

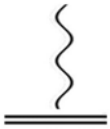
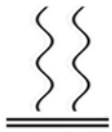
Player-8 H-16-0093 is a TL-8 sound entertainer reproduces sound in the human hearing range.

Comm-9 H-16-9090 R=5 inputs and outputs sound (with a tinny quality) and communicates with similar communicators to Range=5.

MUSICAL PITCH



Musical Pitch. Pitch is most understandable in a musical format. The pitch levels shown correspond to musical C (Middle C= 256 Hertz). The typical human male voice centers on C4 or Middle C; the typical human female voice centers on C5.

Range	SMELL
0 Odorless	
1 Slight	
2 Aromatic	
3 Strong	
4 Intense	
5 Over-whelming	

Smell

Smell senses volatile molecules. Objects emit molecules through evaporation, fragmentation, or combustion, and the types of molecules provide information about objects.

Smell-1

UNDERSTANDING SMELL

The sense organ for smell is the nose. It gathers molecules in the environment and feeds it to a nerve system that processes the information. In addition, some smells (pheromones) create automatic direct responses that bypass the consciousness.

A sophont with the sense of smell has a nose and can smell. A sophont without the sense of smell is smellblind or anosmic.

Smells may original far away; they are senses based on their intensity at the nose (the sensing location)

S =SMELL — Human Smell Constant **10**

Sharpness

Sense ID

Constant

S - 00 - S

Human= 10 2

Smell Intensity	
Odorless	0
Slight	+1
Aromatic	+2
Strong	+3
Intense	+4
Overwhelming	+5

Sharpness Mods	
Second Digit	-2
Third Digit	-3
Fourth Digit	-4
Fifth Digit	-5
Sixth Digit	-6

2D To Notice a Scent
< Constant + Benchmark + Mod + Mod

Range. Roll 2D.

Smell. The Smell Constant for the Race (Human = 10). Higher numbers are better.

Benchmark. Smell Intensity. If zero, there is no smell to be sensed.

Adjust and Comment. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE UNIVERSAL ODOR PROFILE

Differentiator 1 (also Gender)
Differentiator 2 (also Caste)
Overtone

S1 S2 S3 S4 S5 S6

9 A B - 5 6 7

Primary Smell
Differentiator 3 (also Pheromone)
Nuance

The Universal Olefactory Profile identifies Scents. The first three digits (PON) identify the smell of the Scent. The next three digits (GCE) identify the effects of the Scent.

Sharpness is the ability to identify increasingly subtle elements of smell, and the number of digits in the Universal Odor Profile which a sophont may try to identify.

Noticing a Scent provides the first digit in the UOP.

The character may try again to sense the additional digits in the UOP subject to Sharpness and Sharpness Mods, stopping when a failure occurs.

Sharpness is the maximum number of digits in the UOP that the individual can try to sense.

THE SMELL CONCEPT

The Smell Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to smell what he can ("I am sniffing" or "I am trying to smell anything"), the referee resolves the Smell Action based on the Smell Constant, Intensity, and other details.

Once a smell is noticed, the character continues to be aware of it as necessary.

For example, human Eneri Dinsha S-08-1 steps out of his scout ship.

There is a forest fire upwind, but out of sight. The smell intensity at Eneri's location is Slight = 1.

Smell Constant = 10. Benchmark = Intensity = +1. There are no Mods.

The referee hands the player 2D and says "Roll." He must roll 10 +1 = 11 or less on 2D to scent of forest fire in the air.

More About Smell

Smells are atmosphere or water-borne volatile chemicals and biochemicals.

Smell-2

THE DETAILS OF SMELL

The characteristic smell of a Scent consists of its Primary Smell, an Overtone, and a Nuance (together PON). Taken together, these three digits define the smell of a Scent and how it is perceived by the individual.

A Scent is a characteristic of the substance that emits it. The Scent of a chemical or being indicates that the chemical or being is present (or was recently present).

The Racial Characteristic Scent. Each Race has its own characteristic Scent (as indicated on the Being Creation Card and on the Character Card) expressed a PON. Beings of the Race emit (in greater or lesser amounts) a characteristic Scent with the same initial PON. The Scent is further refined by the individual. All members of a specific Gender emit the same G; if there is caste, those of the same caste emit the same C (otherwise the C emitted is random). Individuals emitting pheromones emit them as E (otherwise, the E emitted is random).

Intensity. A scent has a base Intensity at its origin, and reduces in strength with distance from its origin (usually 1 level per 1 or 2 Range Bands).

Identifier

Most Scents have no effect other than as a marker. Some have specific effects.

Gender Identifier. Each Race includes in its definition Gender Identifiers for each Gender. When the Smell of a Scent has been identified, the individual also knows the Gender Identifier (if present and applicable).

Caste Identifier. Each Race includes in its definition Caste Identifiers for each Caste (if the Race has Caste). When the Smell of a Scent has been identified, the individual also knows the Caste Identifier (if present and applicable).

If the Race does not have Caste, this digit has no apparent or obvious meaning.

Substance Effects

The substance which a Scent identifies may have its own effects (which are independent of the Scent). For example, the Scent of smoke indicates a fire nearby. These effects are independent of the Scent.

Respiratory Effects

A Scent with a numeric GC (any numbers from 01 through 99) has a negative respiratory effect when breathed, and equal to 1 hit per digit times Intensity. Intensity-1 scent ABC-95A inflicts Poison-2. Intensity-5 scent ABC-00K inflicts Poison-10.

PSEUDOMONES

Some Scents may mimic Pheromones based on similarities in the PON.

Strong Pseudomone. A Scent PON with the same three Digits (in any order) as the Racial PON. For Race PON= ABC, BCA and BAC are Strong Pseudomones).

Equivalent Pseudomone. A Scent PON with two of its Digits the same (in any order) as the Racial PON. For Race ABC, AYC and C4B are Equivalent Pseudomones.

Faint Pseudomones. A Scent PON with two identical digits which are contained in the Racial PON. For Race PON= ABC, AAT and CCN are Faint Pseudomones.

Pseudomone Effects

A Pseudomone takes its effect from the sixth digit E regardless of other digits in GCE (see the Pheromone table). Equivalent operates at full strength; Strong operates at Double Strength; Faint operates a Half Strenth.

PHEROMONES

A variety of pheromones exist, although they are not necessarily produced by individuals.

The Pheromone Marker. A Scent with a Racial PON and GC=00 is a pheromone with an effect determined by E below. It exerts its effects only on the race identified by PON.

THE PHEROMONE CATALOG

Code	Value	Descriptor	Character
1	1	blank	
2	2	blank	
3	3	blank	
4	4	blank	
5	5	blank	
6	6	blank	
7	7	blank	
8	8	blank	
9	9	blank	
A	10	blank	
B	11	Trail Marker	
C	12	Alarm	
D	13	Opposite Gender Attractor	
E	14	Fear	
F	15	Repellant	
G	16	Soother	
H	17	Gender Balancer	
I	18	Gender Determiner	
J	19	Caste Balancer	
K	20	Caste Determiner	
L	21	Gender Change Trigger	
M	22	Caste Change Trigger	
N	23	Blinder	
O	24	Deafener	
P	25	Smell Blinder	
Q	26	Royalty Marker	
R	27	Universal Compeller	
S	28	Dread	
T	29	Courage	
U	30	Shun	
V	31	Berserk	
W	32	Scatter	
X	33	Paralyze	
Y	34	Freeze	
Z	35	Rally	
0	36	Undefined	

Pheromones impose a variety of effects on the subject based on the Descriptor.

	TOUCH
Hand	
Paw	
Tentacle	
Gripper	
Grasper	
Socket	

Touch

Touch senses direct contact with objects. The pressure of contact (and other details: temperature, texture) provides information about objects.

Touch-1

UNDERSTANDING TOUCH

The sense organ for touch is the skin in general, but specifically manipulators (hands for humans; other manipulators for other sophonts). They feel contact with objects and feed the information to the nervous system.

All sophonts have a sense of touch.

T =TOUCH — Human Touch Constant **06**

Sense ID — Constant — Sensitivity

T - 00 - S

Human=	08	2

Textures

Xfaint	-4
Vfaint	-3
Faint	-2
VSmall	-1
Small	0
Grooved	+1
Coarse	+2
Rough	+3
Very Rough	+4

2D To Notice a Texture
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Touch. The Touch Constant for the Race (Human = 08). Higher numbers are better; a sophont with Touch 20 has better touch sensitivity; one with Touch 04 has worse.

Benchmark. Object Texture.

Adjust and Comment. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

Sensitivity. Sensitivity is the number of times the character may retry before deciding there is nothing of interest.

MANIPULATOR MODS

Manipulator	Grip Mod	Touch Mod
Hand	0	0
Paw	- 2	-1
Tentacle	+1	0
Grasper	0	-2
Gripper	+2	-1
Socket	- 1	-3

THE TOUCH CONCEPT

The Touch Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to feel a texture or a surface ("What does this surface feel like?" or "Are there any seams, or cracks?"), the referee resolves the Touch Action based on the Touch Constant, Sensitivity, and other details.

For example, human Eneri Dinsha T-06-3 is exploring the interior of a ruined structure. He runs his hand and fingers along a stone wall.

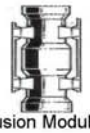
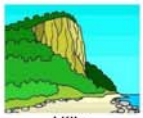
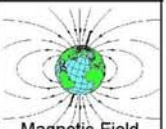
There are Faint carvings in the surface.

Touch Constant = 6. Benchmark = Faint = -2. Mods = 0.

The referee hands the player 2D and says "Roll." He must roll 6 - 2 = 4 or less on 2D.

Option1. Eneri rolls 12. The referee tells him: "There doesn't seem to be much there."

Option2. Eneri rolls 3. The referee tells him: "The surface feels like etched writing, strange writing, obscured by years of dirt."

Range	Mass	Electric	Magnetic
	AWARENESS		
0 Contact			
(=1) R Reading 0.5 m	 Coin		
(=1) T Talking 1.5 m	 Cards		
1 Vshort 5 m	 Book	 Chips	 Magnet
2 Short 50 m	 Suitcase	 Low Energy Devices	 Pistol
3 Medium 150 m	 Person	 Wiring	 Rifle
4 Long 500 m	 Truck	 Fusion Modules	 Metal Devices
5 Vlong 1000 m	 Building	 Generators	 Truck
6 Distant 5000 m	 Hills	 Transmission Lines	 Building
Horizon			
7 Vdistant 50 km	 Mountain	 Lightning Strike	
8 In Orbit 500 km		 Massive EMP	 Magnetic Field

Awareness

Awareness senses electrical and magnetic fields.

Aware-1

UNDERSTANDING AWARENESS

The sense organ for awareness is the nervous system. As a being moves within a field, the nervous system responds to the microcurrents which the field creates, and this information is processed by the brain (in much the way that the skin senses wind or radiant heat).

A sophont with the sense of awareness is aware. A sophont without the sense is unaware.

Awareness is an analog of Vision. When Awareness functions in association with Vision, the result is a form of Synthetic Vision. The brain maps its sensing of Mag and Lek to a three-dimensional metal visual image.

Full Circle Coverage. Awareness functions in all directions. As a result, awareness input is mapped to the beings mental image rather than to the sights seen by the eyes.

False Colors. Awareness is mapped to the mental image using mind generated false colors **Mag** and **Lek**. They are perceived as transparent colors which do not illuminate or reflect. They are perceived despite intervening objects (more or less). To the extent they are not absorbed or attenuated, they create a kind of xray vision.

A =AWARENESS Human Aware Constant **X**

Sense ID — Constant — Acuity

A - 00 - A

Human=

nD To Notice a Field
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Vision. The Aware Constant for the Race (Human do not have Awareness). Higher numbers are better: a sophont with Aware 20 has better awareness; one with Aware 12 has worse awareness.

Benchmark. Object Size minus Range.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Higher Mods are better.

THE AWARENESS CONCEPT

The Awareness Action is the referee's opportunity to present sense information to a character. When the character is trying to sense what he can ("I am trying to sense anything unusual" or "I am concentrating on fields").

The Awareness Action is resolved. Once an object is noticed, the character continues to be aware of it until it moves out of range or somehow becomes hidden.

More About Awareness

Awareness senses electric and magnetic fields. By extension, it senses disturbances in those fields by various masses.

Aware-2

SENSING THE ETHER

Awareness senses the complex jumble of electrical and magnetic fields that pervade almost every environment.

Over evolutionary time, beings who have developed this sense of Awareness come to believe that what they sense is perturbations in the ether, the universal fluid which pervades all space.

In a sense, this understanding provides a working model for the understanding of how Awareness works. All of space is permeated by electrical and magnetic fields and individuals sense these fields and perturbations in them.

Awareness provides three types of sensory input.

Relative Direction. Awareness detects the background magnetic field of a world and allows the individual to instinctively know magnetic north (assuming the world has a magnetic field). A character takes about one sleep cycle for his body and sense to adjust to the new environment; thereafter, he unfailingly knows local directions.

Local Features. Massive objects (mountains, buildings, starships) distort local fields and thus register their presence. This is mapped to visual information as hazy, indistinct silhouettes observable even when visually obscured. Awareness senses mountains even when invisible because of forest, fog, clouds, or distance. It senses buildings even in darkness. Larger masses are sensed farther away; metals are more likely sensed than non-metals.

Electric and Magnetic Fields. Current flowing through wires is sensed as a glow of a specific color ("Lek") even behind walls or barriers (alternating current flickers or pulses). Magnetic objects are sensed as a glow of a different specific color ("Mag").

THE UNSEEABLE COLORS: MAG AND LEK

Code	Name	Character
L	Lek	Color associated with Electric Fields
H	Mag	Color associated with Magnetic Fields

Code. The single letter abbreviation for this color.
Name. The name of this color.
Character. Brief description of this color.

One of the great challenges to Aware artists is the reproduction in paint or pigment of the appearance of Lek and Mag.

For Example

For example, sophont Norhin Sakdili A-20-1 has landed his ship on a new world, its surface shrouded in mist. He is slightly disoriented: he has not yet developed a sense of direction on this world.

He has a general sense of massive objects, feeling the presence of a range of mountains beyond the horizon, and a vast sea in the distance.

Standing at the hatch of his ship, he is aware (behind him) of flickering Lek from the ship's alternating current circuits, and of scattered Mag glows from magnetic devices.

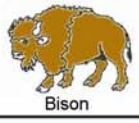
There is a storm near the horizon Range=6 and a flash of lightning Size=7.

Awareness Constant = 16. Benchmark = Size minus Range = 7 – 6 = +1.

The referee hands the player 6D and says "Roll." He must roll 20 +1 = 21 or less on 6D to notice lightning. He has a 55% chance of success.

Option1. Norhin rolls 12. The referee tells him: "You see a flash of Lek on the horizon." Norhin starts counting and at 18 the referee says, "You hear a distant clap of thunder." 18 / 3 = 6 km distant.

Option2. Norhin rolls 31. The referee tells him: "There doesn't seem to be much going on."

Range	Life	Thought
	PERCEPTION	
0 Contact	 Flea	Calm Life Processes
R Reading 0.5 m	 Moth	Complex Life Processes
T Talking 1.5 m	 Bird	Simple Thought
1 Vshort 5 m	 Rat	Complex Thought
2 Short 50 m	 Dog	Strong Emotion
3 Medium 150 m	 Man	Death Throes
4 Long 500 m	 Bison	Death Throes
5 Vlong 1000 m	 Hexaphant	
6 Distant 5000 m	 Leviathan	
Horizon		
7 Vdistant 50 km	 Forest	
8 From Orbit 500 km		

Perception

Perception senses auras surrounding life and intelligence.

Percept-1

UNDERSTANDING PERCEPTION

The sense organ for perception is the brain. Native brain structures detect auras associated with life and with intelligence directly and process the information.

Perception is an analog of hearing: a sophont "hears" the information that the perception sense provides overlaid by brain processes on whatever hearing input is available.

The sense organ for awareness is the nervous system. As a being moves within a field, the nervous system responds to the microcurrents which the field creates, and this information is processed by the brain (in much the way that the skin senses wind or radiant heat).

P = PERCEPTION Human Perception Constant **X**

Sense ID — Constant — Tone — PVoice

P - 00 - T P

Human=

nD To Notice an Aura
< Constant + Benchmark + Mod + Mod

Range. Roll Dice equal to Range.

Perception. The Perception Constant for the Race (Humans do not have Perception). Higher numbers are better: a sophont with Perception 20 has better perception; one with Perception 12 has worse perception.

Benchmark. Object Size minus Range.

Mods. Mods based on circumstances from the Master Mods table (as applicable). Multiple Thoughts or Emotions of the same type use the Multiples Mod. Higher Mods are better.

THE PERCEPTION CONCEPT

The Perception Action is the referee's opportunity to present sense information to a character. When the character indicates he is trying to sense what he can ("I am concentrating on life signs or thoughts" or "I am trying to sense anything ususual"), the referee resolves the Perception Action based on the Perception Constant, Range, Object Size, and other details.

Once an object is noticed, the character continues to see it until it moves out of range or somehow becomes hidden.

For example, sophont Sir Glibern Dashash P-24-33 is preparing for the evacuation of Efate, shredding files and destroying technical equipment. The Zhodani invasion is imminent.

A missile strike hits Windrose City, some 50 km away R=7. Thousands of people die in a matter of minutes = Multiple Death Throes = Size 8.

Perception Constant = 16. Benchmark = Size minus Range = 8 - 7 = +1. 100,000 victims = +5.

The referee hands the player 7D and says "Roll." He must roll 24 +1 +5 = 30 or less on 6D to notice the death throes. He rolls 24. He feels the pain of thousands of people dying. A couple minutes later, the building shakes and he hears a loud sound in the distance.