

Diamond Firetail Finch

by Matthew M. Vriends, Ph.D.
The Netherlands

Photo by Dale R. Thompson and George D. Dodge



The Diamond Fire-tailed Finch comes from many parts of Australia. It is commonly known to U.S. aviculturists as the Diamond Sparrow. It is not, however, related to sparrow-like birds.

Scientific names:

Emblema guttata, *Stagonopleura guttata*, and *Zonaeginthus guttatus*. The first stated name is the most recent.

Other names:

Diamond Firefinch, Diamond Finch; also frequently Diamond Sparrow (a name that is not recommended as this bird is no close relation to sparrow-like birds), and Spotted-sided Finch.

Subspecies:

None. According to J.A. Keast (1958), there are no geographical races; the species *philordi*, mentioned by G.M. Matthews in his book, *The Birds of Australia* (London, 1910-27) must therefore be regarded as a synonym of *guttata*.

Description of Wild Bird

Cock: The head and neck are grayish-blue; back and wings olive-brown; rump and upper tail coverts crimson; throat white; breast with a wide, black band that runs along the flanks and is bordered by the wings; underside whitish; flanks, black with white spots "diamonds"; the second part of the scientific name *guttata* means "spotted" and *zona*, in the already from 1796 dated name *Zonaeginthus*, is the Latin word for "band": the Greek *aigintha* is a "kind of bird." Beak maroon; the lores are black. The eyes are bordered with a conspicuous red eye-ring, the same color as the iris. The legs and feet are grayish-brown.

Hen: Is usually difficult to distin-

guish from the male; with enough comparative material the hen's head and body seems generally slighter in structure. The lores are brown instead of black; this is a good distinguishing mark in older birds. The eye-ring is generally lighter in color, as is the beak (pinkish-red).

Immature: Generally less colorful, with greenish-brown wings and back; the rump and upper tail coverts are carmine-red; the tail feathers are not black, but brownish-black; unlike the conspicuous ash-blue head of the adults, in juveniles it has a greenish wash, as has the sides of the head. The flanks are greenish-brown with large gray-white bars and spots; the underside of hens is light gray, in young cocks, however, much lighter, almost white. The beak of young hens at about three

months of age is generally light red; that of young cocks is dark red with a violet tinge. The rump and upper tail coverts of young hens are dull red; that of young cocks are lighter red with a pale sheen. These color differences can sometimes be seen in older birds, especially when not in breeding condition. A cock bird ready for mating, however, is easy to distinguish by his frequent singing, and his vivid-red eyerings. Should the bird moreover take a grass stem in the beak, stand high on the legs, and press the beak down against the breast, it is definitely a male. During this performance he will also let his song be heard. The cock sometimes sings outside the breeding season, but much less frequently. Also, outside the breeding season, the hen takes no notice of the male's singing; she just keeps to herself.

Apart from the male song, sexes of young birds are difficult to determine outwardly. Even the white spots on the flanks – which are sometimes larger in hens – are no sure indication. The only sure way, as we have said, is the song of the male.

Size: 4.5 inches (11.5 cm), sometimes a little smaller, sometimes to 4.75 inches (12 cm); tail 1.7 in (4.3 cm); wings 2.5-2.75 inches (6-7 cm).

Distribution: Central and southern Queensland, and via the Great Dividing Range in New South Wales, through Victoria to western South Australia (Eyre Peninsula); also on Kangaroo Island (large island south of Adelaide, South Australia).

Field Biology: Diamond finches live in open terrain, including grasslands, mallee thickets, gardens, parks, and open woodland, generally in the immediate neighborhood of water. I have seen these birds on Kangaroo Island close to towns, especially in gardens and parks. In Queensland I have also frequently seen them close to human habitations. In Adelaide I observed them especially in the sparsely wooded hills, where they had plenty of space to move about in. By leg-banding numbers of birds over a two year period, I ascertained that they were largely sedentary and almost never left the area in which they were

hatched and reared. It seems that most pairs build a new nest in the same shrub in which they nested the previous year. I observed some pairs even repairing or rebuilding their old original nests and reusing them. It is therefore understandable that in some areas, where the habitat is in their favor, they remain all year round. Juveniles usually also stay in the area in which they were reared, breeding themselves when the time is ripe. In spite of this, continual urbanization is gradually forcing populations of the birds further inland. I observed a typical example of this when, on Kangaroo Island in 1983, Diamond Finches were forced more than 1,100 yards (about 1 km) further inland in a single year.

Diamond Finches are very strong on the wing; they fly powerfully with flowing, light undulations – this is a characteristic of birds that live in open terrain and must be quick on the wing to escape from predators. This typical kind of flight can be seen with many Australian Finches, but especially in all firetail species. However, it has to be said that the flight of the Diamond Finch is the most beautiful of all.

Food: Diamond Finches are mainly seedeaters. Like sparrows, the finches hop on the ground in search of seeds, but they also jump up to the heads of seeding grasses with some success. During the breeding season, the birds supplement their menu with insects which they also find on the ground or “pluck” from the foliage of plants. In captivity, Diamond Finches will be content with a commercial seed mixture as the main part of the diet, but they show preference for white and Japanese millets, especially outside the breeding season. During the breeding season sprouted seeds and seeding grass heads are taken avidly; millet sprays and bunches of seeding weeds can also be given in the aviary. It is recommended that such seed heads are offered throughout the year; if they are offered only in the breeding season it is possible that the birds will eat too much of them and become too fat. If they are given all year round it will discourage the birds from eating these seeds exclusively and they will also seek out other food. In this connection it should be noted that hemp is also one of their favorite seeds. But this should be given only sparingly, even when the



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birds are in a large aviary with plenty of exercise space.

In the wild various termites, other insects and their larvae are taken by the breeding adults and fed to the nestlings. In the cage or aviary, small mealworms, or maggots can be given; these larvae should first be killed by immersing them in boiling water (use a net or a piece of old nylon pantyhose). Fruit flies and white worms (*Enchytrae*) can also be given, as can commercial egg food (Cédé, L/M's Universal Plus etc.). Grit must be available throughout the year, and a mineral block should also be available. In the wild I have seen the birds eating pieces of charcoal. In captivity I would therefore also recommend that charcoal is made available (grains of charcoal are present in most commercial grit mixtures). However, charcoal should be given very sparingly and cautiously. The necessity of a daily supply of charcoal is questionable as it is suspected of absorbing vitamins A, B2, and K from the intestinal tract. If this is correct, it can mean that charcoal can cause vitamin-deficiency disease.

During the breeding season I also like to give my birds some water-soaked brown bread, although it must be removed after a few hours as it will sour rapidly. Put egg food, soaked bread, and other quickly perishable foods in the sheltered part of the aviary so that they don't spoil too quickly. Never use milk in which to soak bread as many birds cannot tolerate it.

As in the wild, captive birds drink regularly but especially in the early hours of the morning. Unlike most birds but like Zebra Finches, Gouldian Finches, doves and pigeons, they suck the water up. This "method" works very well early in the morning, or after light rain, when dewdrops hang from the foliage; the birds can suck up the water directly from the leaves, or from a concave stone, etc. Birds that live in areas subject to drought are often able to suck up water in such a way. You may often see this in an outdoor aviary after a shower of rain; the birds gently hopping along twigs and sucking up drops of water that hang from them. I have also seen both aviary inmates and wild finches jumping up to hanging dewdrops, catching them on the tip of the beak, and swallowing as they land. In the aviary, the birds are very partial to running water; a little fountain with fresh running water is indeed a luxury for most fanciers but it will not only be

good for the health and influence behavior strongly and positively, it also cuts out the danger of spoiled, infected water. In spite of this I give my Diamond Finches (and other birds) a fresh dish of water in which a dose of vitamin/mineral supplement is dissolved, twice per day.

Calls: Before the breeding season actually gets underway, the cock is already charming his spouse with a simple song. The song is somewhat harsh sounding and consists of a series of simple notes; I can best describe it as "qweat, qweat, qweat-the-qweat-the-qweat" (ea as in sea); sometimes one can hear variations. In the wild, as well as in the aviary, one can hear the contact calls, not only when a group is together (usually 20-30 birds including the current year's offspring), but also when one or more birds have strayed too far away from the group and are being warned to return. Such contact calls have a nasal character, are fairly consistent but quite urgent beginning with a high tone and then gradually descending into the second syllable; "whoo-oo-oo-hee-ee-ee" (oo as in wood; ee as in heat). A similar somewhat softer call is used for contact between cock and hen. During the breeding season the call (especially near the nest), especially that of the cock, is higher and louder. The cock identifies himself with such a call when he approaches the nest, so that the hen is not alarmed. Normal contact calls are used when the birds seek shelter from the midday heat, and also evenings when they assemble to roost.

In this connection it is worth mentioning the "snoring call" first described by the ornithologist J. Welschke. This is a call uttered by one of a pair before flying from the food hopper to the nest in order to relieve his/her mate. This "snoring call" is actually uttered *before* the bird takes to the wing and the bird in the nest answers in a similar fashion. I have observed this behavior, together with the "snoring call" several times in large cages, especially in outdoor aviaries, and even once in the wild (in Queensland) whereby one of the birds, about 5 ft. from the nest (and about 12 ft. from where I was concealed) was acrobatically removing some seeds from grass heads. Once the bird finished eating, it sat dead still on the ground, and uttered a low toned, somewhat drawn-out "chrou-chrou-chrou" (ou as in ought) which was answered, almost immediately by the bird in the nest.

Welschke, as well as Immelmann, is convinced that the answer from the bird in the nest means that all is safe and well, and that the relief can take place without danger. This behavior can also be seen in the Red-eared Firetail Finch. I agree with both of these ornithologists, having observed the behavior myself several times. Immelmann is right in pointing out that this form of communication (that we know from several other species of Australian finch, including the Zebra Finch and the earlier mentioned Red-eared Firetail Finch) has evolved as a result of the long entrance tunnel to the nest, in which a bird in the nest would have absolutely no visual contact with the outside world.

In the case of a nest not yet fully completed, the bird can look outside and see possible danger in time, whereas a bird in a fully completed nest with tunnel cannot see such danger itself and requires assistance. The tunnel is thus constructed first, before the nest, and we must note further that the birds continue to add to the nest even when they have eggs or youngsters.

The so-named snoring call, is something like the somewhat harsh song of the cock, only it is not so long, and is interspersed with an "ee" (as in deep) sound: Kwee-ou-kwee-ou, kwee-ou-three-ou-three-kwee, and the necessary variations on this.

The lure call (which the birds use on approaching each other) of the cock is higher than that of the hen, and is held longer; it sounds like: Woo-oo-ee-ee, woo-oh-ee-ee (oo as in too; eee as in sea).

Courtship and Mating: Diamond Finches are very temperamental, and this shows during courtship. In Australia they can sometimes breed throughout the year, when suitable conditions prevail. However, all year breeding of captive birds is not advised, as sooner or later you will be confronted with egg-binding, weak youngsters or other problems.

It has been determined that Diamond Finches pair up early in life and that this pair bond is sustained for life. I consider the courtship display of the Diamond Finch to be exceedingly pronounced: the cock repeatedly makes a spectacular display. Before beginning his dance, he seeks out a long stalk of grass which he then holds in his beak. Thus "kitted-out", he flies to a high, thin branch. Once there he sits bolt-upright and bobs up and down with the stem

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in his beak. (I have observed birds with stems over 4.5 ft. [135 cm] in the beak trying to balance, and even falling off the perch.) The head is stretched up as far as it will go, but with the beak pointing down towards the breast, and all the time trying not to lose the stem! Additionally, he spreads out his flank and belly feathers imposingly, and appears almost doubled in size. Once in this position he begins to make bobbing movements as his legs and feet are bent and stretched in turn, like a "bouncing ball" as described by Immelmann. His toes always hang tightly onto the twig during this performance; in other words the whole display takes place in one spot. While performing he lets out his harsh "kweet, kweet, kweet, kweet" calls. As soon as the hen reacts and comes into his sight, the cock makes the last deep movement and stretches his neck like a youngster begging for food (compare this with the well-known begging behavior of young Zebra Finches!). He also lets out his "kweet, kweet" sound while doing this. This behavior can be best observed with birds in a large outdoor aviary.

Nest: The Diamond Finch often builds its rough nest under the huge nests of eagles and other birds of prey. I have also found their nests among the thickly packed twigs of crows' nests. Twice I have found nests of Diamond Finches under the eaves of a derelict barn used by cattle at night; five times in a lemon tree in a friend's garden; eight times in a rose bush, three times in an orange tree, once in the nest of a crested hawk, *Aviceda subcristata*, and many times in eucalyptus trees infested with mistletoe. You can thus imagine that these birds are not particularly fussy with regard to nesting sites.

Generally, however, the bottle-shaped nests are found in thick shrubs or other undergrowth; sometimes in high spots, even in trees (I have found nests sometimes as high as 25 m up in trees). The nest itself has a long, tunnel-like entrance up to 3 in. (8 cm) long and the main nest is about 6 in. (15 cm), with the nest chamber about 3 in. (8 cm) in diameter. The nest is made from grass stalks and strips and similar items. Sometimes very long stalks (I have found stalks used up to 45 cm long) are used, but also thin twigs and strips of bark are used. The inner chamber is lined with soft grass and feathers. Both cock and hen continue to strengthen and repair the nest, even when there are eggs

or young in it. From this you can well imagine that Diamond Finches are very active birds and in captivity must have an aviary or at least a very roomy cage otherwise they are likely to pine away. Outside the breeding season the birds are kept busy building dormitory nests or practice nests; once a number are built, the birds will unceasingly restore, repair, rebuild, strengthen, lengthen tunnels, etc. I saw several sleep/breeding nests that had an extra entrance/exit tunnel (often opposite the main entrance but sometimes in the roof or one of the sides); these were probably used as emergency exits. While Australia has a large population of snakes and lizards, these emergency exits are no luxury; a meaning held by many ornithologists. The extra tunnel is, at first, kept closed; the opening in the wall or roof is first made when the young have hatched. It is interesting to note that many African waxbills, Cordon Bleus, etc. build a similar nest (Immelmann).

Incubation: The clutch normally consists of 5-8, but may range from 4-9 eggs, each about 18 x 13 mm. The birds start to incubate after the second egg has been laid. The sexes take it in turn to incubate, but usually both parents incubate at night. The period of incubation is two weeks.

In their native Australia the main natural breeding season stretches from August to well into January (spring and summer), but sometimes additionally in autumn from March to the end of May, and exceptionally in winter during June and July depending on weather conditions and availability of food.

It is thus possible for a pair to rear three broods in the year. The young leave the nest at about one month of age, but sometimes as young as 21-26 days. However, they are still fed by the parents for a considerable time after fledging. They attain full adult plumage in one to three months and are then difficult to distinguish from their parents.

Social Behavior: As we have already said, the birds live in groups of about 30 outside the breeding season, though odd isolated pairs may still be seen occasionally. They inhabit mallee scrub, eucalyptus woodland, farmland and riverine areas. During the breeding season the groups remain in loose contact, often building their nests in close proximity, sometimes even in the same shrub or tree!

In the aviary, as we will see, the sit-

uation is quite different. Pairs are best kept singly, as males are prone to fight and we cannot afford such risks with breeding birds. It would only take two cocks to fight to destroy the harmony of all birds in the aviary.

In the wild I saw the birds in groups repeatedly drinking together, foraging for food, even helping each other out in nest building and feeding the fledglings.

The Diamond Finch in Aviculture

Introduction: The Diamond Finch is not really suitable as a cage bird; being a very active bird it would soon get too fat in a confined space. Trying to breed with obese birds will not be very successful. Small aviaries with numbers of other finch-like birds are also not very suitable as Diamond Finches have the nasty habit of vandalizing nests, disturbing eggs and nestlings, and generally interfering with breeding. However, I must honestly say that I have come across several pairs of Diamond Finches that were quite friendly and sociable; but strong behavioral differences mean that fanciers must keep a close eye on Diamond Finches when they are kept in community aviaries, so that any potential problems can be swiftly nipped in the bud.

Many breeders, including myself, like to place several Diamond Finches of both sexes together in a large aviary and allow them to pair up themselves. This is recommended because Diamond Finches are strongly monogamous; wild birds often pair bond, even before they have their full adult plumage. It is quite easy to follow this method if you have leg banded your birds with rings of various colors. As soon as a pair has formed it must be immediately removed to a large cage, placed out of hearing of the other Diamond Finches. The pairs can be returned to aviaries when they are completely rested and at least one year old. If you want to breed selectively (breeding mutations for example) and must place chosen pairs together, this is quite easy as long as you keep them out of sight and sound of the other birds until the pair is in breeding condition.

We will of course be using only acclimatized birds, for example, those bred in Europe (Australia has banned all exports of native birds since 1960)

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must be kept for the first 30 days in large, dry cages, observed, and gradually accustomed to the USA available seed menu before being used for breeding. Diamond Finches are not particularly difficult birds to breed and, with a little insight and knowledge, even the beginner can be successful. Incidentally, the first captive breeding results in Europe were in France about 1855, and The Netherlands from 1865, with Mr. Cornelly being the first breeder.

Housing: As we have said, the most ideal housing for Diamond Finches is a large, well designed aviary, so that the birds can take cover if necessary. You can keep other finches in such an aviary, but bear in mind that certain individuals can "cause trouble." Some breeders who have an aviary at least 8 m long (26 ft.) use already formed pairs to form a colony. This will be successful, as long as we remove any "trouble-makers." Such an aviary will house seven or eight pairs of Diamond Finches along with other finch species.

The aviary must always be dry and draft-free, protected from cold winds. In areas with prolonged rainy periods it is recommended that at least half of the outside flight is roofed over with transparent roofing material, so that the floor stays dry. The length of the aviary must always be enough to allow the birds adequate flying room, without hitting something once in flight. Medium sized shrubs, clumps of grass, and similar low plantings are recommended, so that birds can take shelter if there is any trouble.

Furthermore, it is important, as we have mentioned above, to provide a fountain with running water so that the birds always have fresh water. It would be ideal to install a sprinkler system in the open part of the flight, not only for the benefit of the plants; the birds will also use it. It is a wonderful sight seeing the little finches have a

shower!

However, the floor of the aviary must not be permanently wet. Many fanciers have the sprinkler system only in the open part of the flight and set it to work in the morning say from 10-12 AM, allowing the midday sun to dry everything up again before evening, so that the birds don't have to go to roost in a wet environment. If for some reason or other you cannot supply running water or a sprinkler system, you must give water in large, shallow, earthenware dishes so that there is no danger of the birds drowning. Such dishes must naturally be cleaned and refilled with fresh water several times per day.

An adequate temperature is important for the well-being of the birds. Temperatures below 60° F (15° C) are not well tolerated. Birds housed in outdoor quarters must therefore be taken indoors as soon as temperatures start to drop in early fall.

Diet: Diamond Finches may be fed on various kinds of millet and sorghum seeds, but they prefer white and Japanese millet, especially during the breeding season and in the colder months of the year. Canary grass seed, seeding grass heads both ripe and unripe, and weed seeds can all be offered. Ripe seed heads will be taken greedily if you place them in bottles of water set into the ground. Millet and canary seed can also be given in soaked or sprouted form, as well as greenfood such as lettuce, spinach, chick weed, endive, chicory and so on. Although not all birds will take them, insects are an important part of the diet; commercial rearing and egg-foods for canaries can also be given, not only in the breeding season, but throughout the year. Yet, as I have already said, I have known pairs of Diamond Finches that ignored insects as long as they had seeding grass heads available. In spite of this I recommend that insects such as the following are made available: ant pupae, small mealworms, enchytrae, maggots, spiders and similar. Fruit flies (*Drosophila*) are taken avidly; you can attract these (and other insects) with a piece of banana (or other fruit) laid in the sun and covered with mesh to stop the birds coming into contact with it. The birds will catch the insects hovering around the fruit or sitting on the mesh. The fruit should be changed every couple of days. Finally, the birds must have a mineral block, salt wheel (available commercially), cuttle fish bone, oyster grit, and some char-

coal (but not too much of the latter). I give my birds stale wholegrain bread soaked in water twice a week (but beware of mold), and a good brand of vitamin/mineral supplement in powder form that I sprinkle over the bread or greenfood.

The Breeding Period: It is very important to provide adequate nesting material at breeding time. You must keep a good eye on the birds, who will steal materials from other nests if the don't have enough! Such behavior can be detrimental to other broods as the thieves don't make any distinction between empty nests or those containing eggs or young!

Cocks in breeding condition will perform their courtship dance and partners will be continually preening each other. Preening is a very important activity in the life of the Diamond Finch, and is carried out between partners at all times of the day. Newly fledged young start preening themselves and each other almost immediately. Preening is a family affair, pairs or siblings rarely carrying out with "unrelated" members of the group.

In Australia, well cared for captive Diamond Finches will breed throughout the year, but in our area we should stick to no more than three broods per annum, beginning in April or May. Many fanciers start breeding only when they are sure they have a constant supply of grass and weed seeds plus insects. The birds will show they are in breeding condition by courtship dances (by the cock) and the collecting of nesting materials. A large amount of nest material is used by Diamond Finches, often three to four times more than other Australian finches! So make sure they have enough. Experience has shown that long, pliable, grass stems are favorite for building the nest chamber, interwoven with small down feathers (chick feathers are prized). Hay, small twigs, and wool may also be offered.

The nest is bulky and usually bottle-shaped, with one entrance. Frequently one or two extra nests are built on top or on the sides for roosting purposes. Both partners build the nest. Make sure you have thick shrubs in the aviary (2-2.5 m high) (6 ft.); these will be used as nesting sites in preference to nest boxes. However, it is advisable to also offer a number of nest boxes. However, it is advisable to also offer a number of nest boxes at various sites, minimal measurements 15 x 15 x 15 cm (6 x 6

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Clutch: The hen lays usually 4-6 eggs (in the wild 7-9), but four young are usually reared. Both parents take turns at incubating. Diamond Finches are regarded as excellent parents, but are not tolerant of too many nest inspections, especially after the young have hatched. It is therefore recommended that youngsters are first leg banded just before they fledge. Young that leave the nest too early rarely return for the night and there is a great risk that they will succumb to the cold.

Incubation starts after the second egg is laid, and takes about 12 days. It may be prudent to point out that the eggs of first breeding pairs will do better if fostered out to Society Finches (Bengalese). I have noticed that if allowed to rear their own chicks, young pairs often abandon them after only a couple of days feeding.

In Australia, I noticed that many breeders divided a brood of Diamond Finches among two or three pairs of Society Finches (or placed them in the nests of Diamond Finches that had only one or two young), as it is impossible for these foster parents to rear a whole brood of Diamond Finches; young Diamond Finches eat a lot more than young Society Finches, so the food supply of the foster parents is inadequate to feed them all properly.

Young: The young are fed by both parents, and are never left alone in the nest! So, when one parent is foraging for food the other stays in the nest, only leaving when the partner has returned. Only after 12-14 days will it happen that both parents leave the young alone for short periods. After foraging, they always stay awhile in the nest, but this period also shortens and when the young are about 20 days old both parents will be busy going backwards and forwards keeping them fed! This behavior encourages the young themselves to leave the nest, especially when one of the parents sits outside with food in its beak, luring the youngster out! The strongest youngster makes the first break into the wide world. As soon as the other youngsters see this – especially when they are also hungry – they will follow suit.

Shortly after the youngsters have fledged the parents will become extremely agitated, as the fledglings do not stay easily together, but seem to disappear into every corner of the aviary. It is interesting to watch (with binocu-

lars) how the parents try to get the young together where they will have more control over them. After a few hours they usually give up these attempts and feed their brood in a somewhat calmer manner; they continue to feed the young a variety of foods for about three weeks, before they become independent. Evenings and nights the parents and young return to the old nest or to a sleeping nest to roost. After leaving the nest early in the morning, they have a mutual preening session before going to eat and drink.

Diamond Finches remain fertile for a relatively long time; five years is about the average. They should not, however, be allowed to breed until they are at least 12 months old. Average life expectancy for a Diamond Finch is seven to eight years, providing it receives optimum housing, care and feeding.

Three color mutations are known at the present time: the recessive yellow (the conspicuous red rump of the normal form is replaced by orange), the sex-linked fawn, and obviously, the yellow split for fawn (yellow/fawn). ➔

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