



FEDERATION GENEVOISE DES SOCIETES DE PECHE



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DOSSIER DE PRESSE

**PROJET DE SAUVETAGE DE LA FAUNE
PISCICOLE
DE LA RETENUE DE VERBOIS
LORS DE LA VIDANGE
DU BARRAGE DE VERBOIS
(du 30 mai 1997 au 4 juin 1997)**



Genève, le 28 mai 1997

Mesdames,
Messieurs,

La Fédération Genevoise des Sociétés de pêche a le plaisir de vous informer qu'elle va utiliser, en **première mondiale**, un procédé écologique permettant de repousser les poissons depuis le barrage de Verbois vers l'amont et de les maintenir, à l'aide d'une « barrière sonore », dans des sites propres à les mettre à l'abri des effets de la vidange de la retenue de Verbois.

Déroulement de l'opération de sauvetage de la faune piscicole de la retenue de Verbois:

Date : le 30 mai 1997

Lieu : Barrage de Verbois

Heure : 6 h

Description : Prise en charge et transport par l'entreprise ZSCHOKKE, jusqu'à la passerelle de Chèvres, des radeaux et du matériel de la FGS (Fish Guidance Systems Ltd)

Heure : 8h

Lieu : Passerelle de Chèvres

Description : Mise en route des systèmes et départ de l'opération permettant de repousser les poissons jusqu'à l'amont du Pont Butin où les radeaux équipés des systèmes de la FGS seront amarrés et resteront en fonction jusqu'au 4 juin 1997.

Arrivée estimée au Pont Butin et fin de l'amarrage à 17H

Heure : 17h

Lieu : Sous le Pont-Butin (rive gauche)

Description : **Conférence de presse** par la Fédération Genevoise des Sociétés de Pêche, les ingénieurs de la FGS et les invités au sujet de tout le projet mis en oeuvre.

Le projet est parrainé par les autorités cantonales (DIER, DJPT, DTP, SIG) et plus particulièrement par monsieur **Claude HEAGI** et monsieur **Gérard RAMSEYER**, Conseillers d'Etat, qui ont apporté plus que leur soutien à la réalisation de ce **projet unique au monde** et qui nous feront l'honneur de leur présence sur le site du projet de sauvetage des poissons, auquel ils participeront activement.



ZSCHOKKE

Société Anonyme Conrad Zschokke

TRAVAUX SPECIAUX

Chemin Isaac-Anken 10
Case postale 213
CH-1219 Aïre

Téléphone: 022/796 86 11
Fax: 022/796 86 33

FEDERATION GENEVOISE
DES SOCIETES DE PECHE
A L'ATT. DE M. ZUODAR
LA FERME DU CHATEAU
1263 CRASSIER

N/Réf. : Aïre/Oll/DJG/ZTS 8458

Genève, le 14 mai 1997

Concerne : FGS - Rhône - Vidange de Verbois

Monsieur,

Suite à votre demande, nous avons étudié votre projet et après plusieurs variantes dont nous vous avons tenu avertis et que nous avons examiné ensemble, nous pouvons, ce jour, vous proposer une solution qui réponde à vos désirs dans les limites des possibilités. En effet, il est impensable de laisser 4-5 jours des radeaux au milieu du fleuve coulant à 3.5 à 4 m/sec. avec des hydrophones pesant 100 kg et représentant environ 1 m³ suspendu à 3 ml de fond.

Nous avons opté pour une solution plus sûre et surtout plus facilement « rattrapable » en fonction de l'évolution des débits donc des vitesses (voir croquis d'implantation en annexe).

La base des radeaux est constituée par des flotteurs de la suceuse des Cheneviers mis gracieusement à notre (et votre) disposition par le DIEAR Assainissement - M. Beerli, capitaine. Ces flotteurs seront assemblés et munis - à l'amont - de « pointe » en tôle pour éviter « l'enfournement » et écarter des troncs éventuels.

Ces radeaux supporteront la génératrice provisoire 1.5 KVA, les tableaux FGS et, suspendus et retenus, les hydrophones fournis par vos soins. Amarrés à un seul câble partant du côté fleuve des 2 piles de rive à environ 30 à 50 ml, à l'aval, ils seront écartés de la rive par un câble arrière en biais. 2 amarrages à terre, maniables depuis terre et ayant la force d'arracher l'amarrage arrière, si nécessaire, permettront de ramener contre terre ces radeaux suivant l'évolution de la vidange (voir les croquis d'implantation, d'amarrage et de construction des radeaux).

L'amarrage dans les piles du Pont Butin se fera dans la « fenêtre » aval à environ 3 ml au-dessus de l'eau, sur une « pointelle » développée dans le tunnel d'accès à cette fenêtre. L'arête en granit sera garnie de bois de façon à ne pas blesser le câble Ø 16 de retenue du radeau. Aucun trou ni scellement ne sera fait dans les piles du Pont Butin. Les amarrages sur terre ne seront constitués que de piquets fer battus et de tireforts 3 to mouflés.



ZSCHOKKE

Société Anonyme Conrad Zschokke

TRAVAUX SPECIAUX

Chemin Isaac-Anken 10

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Téléphone: 022/796 86 11

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Selon vos indications, nous avons tracé le programme, annexé, qui tient compte des impératifs de la navigation des barges, de l'arrivée de votre matériel FGS, des temps de préparation, etc...

En ce qui concerne le 30 mai 1997, refoulement des poissons et création du « barrage sonique » à l'aval du Pont Butin, il se déroulera de la manière suivante.

Au Pont Butin, les amarres longitudinales et « écarteurs » seront en place. A Verbois, les 2 radeaux chargés, prêts et essayés, les hydrophones remontés en surface, seront remorqués par 2 nacelles hb de 40 CV (départ 0600) jusqu'au Pont de Chèvres. Amarrés provisoirement, les hydrophones mis à l'eau et attachés, les radeaux seront remorqués à environ 1 km/h. jusqu'à l'aval du Pont Butin. Une nacelle complémentaire fera la navette et sera à disposition pour tous services d'appoint ainsi que pour procéder aux opérations de raccordement des amarres sur place.

Les génératrices « de voyage » seront remplacées par une alimentation venue du Pont Butin, le long des rives, dans les arbres, mise en place par vos soins.

Les 3 nacelles seront amarrées dans des endroits calmes, hors d'atteinte de la baisse de niveau du plan d'eau qui sera au Pont Butin de 1.50 à 2 ml environ.

Une surveillance régulière sera exercée spécialement pendant la période de « chasse » (dimanche 1er juin dès 12h00 au lundi 2 juin à 20h00).

Compte tenu de ce qui précède, nous vous soumettons, en annexe, le devis de nos travaux.

Nous vous remercions de nous avoir associé à ce projet et espérons avoir répondu à votre demande.

Nous restons à votre disposition pour tous renseignements complémentaires et vous présentons, Monsieur, nos salutations les meilleures.

SOCIETE ANONYME

CONRAD ZSCHOKKE

PS : Ne sont pas compris dans le devis annexé toutes les demandes d'autorisation, location du domaine public et privé ainsi que toutes démarches administratives.

Annexes : Croquis d'implantation A et B
Croquis radeaux et amarrages
Programme prévu
Devis estimatif

No.

Concerne:

Objet:

FGS - Verbois

Radeaux



Date:

13.5.97

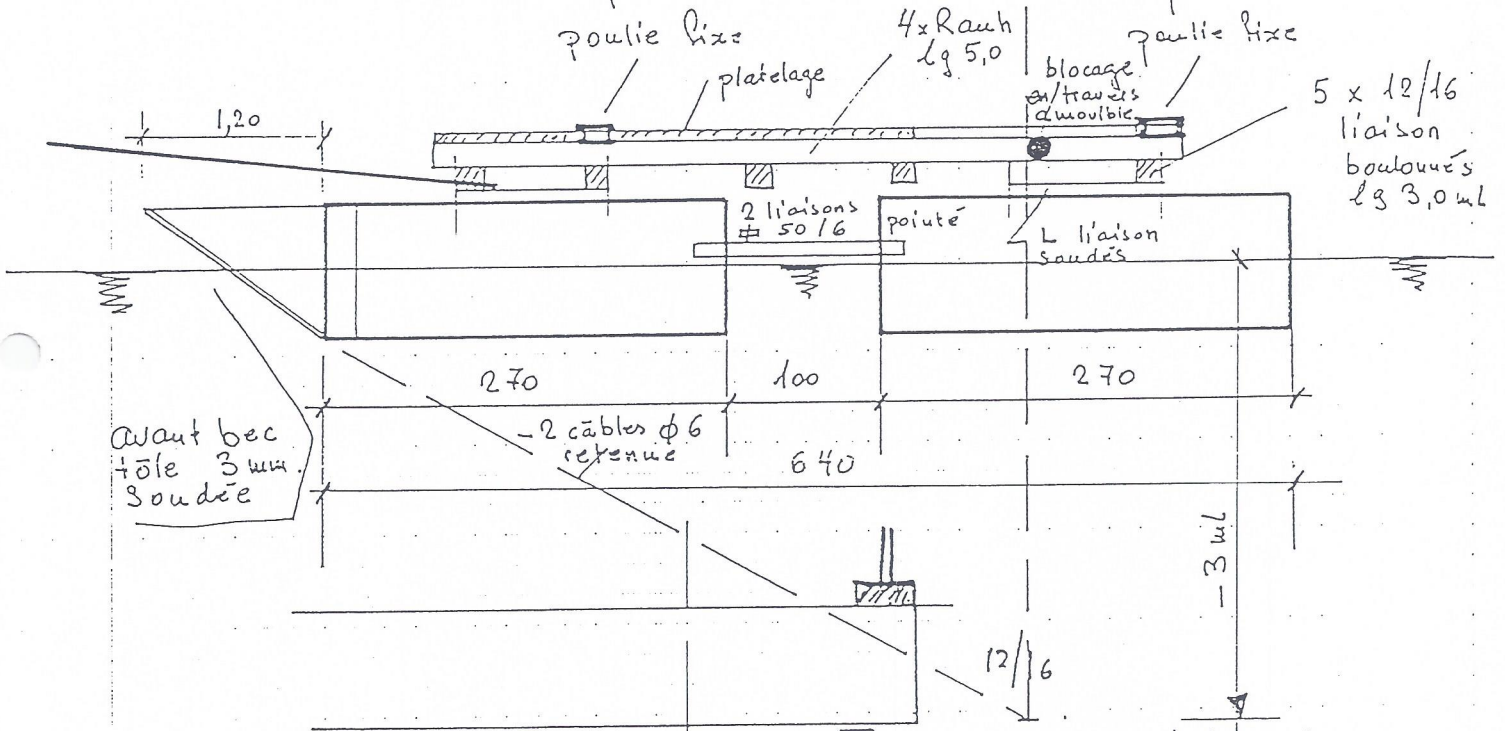
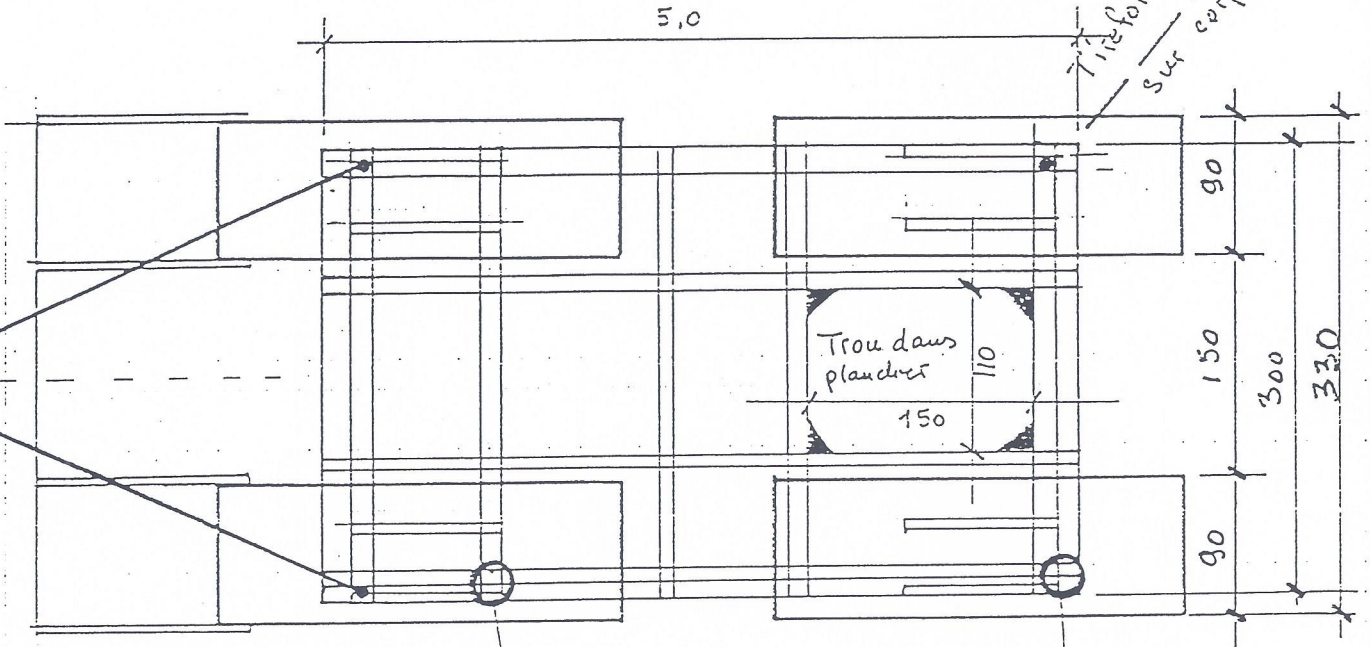
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Page:

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Plan Radeaux Ech 1:50



- + 1 barrière autour
- + 1 "chèvre" pour hydrophones
- + blocage avant et en travers

Flotteurs φ 90

Ech. 1:10

Société Anonyme Conrad Zschokke ZTS - Travaux Spéciaux

A. OH

No.

Concerne:

Objet:



FGS Verbois

Radeaux
Amarrages

Date:

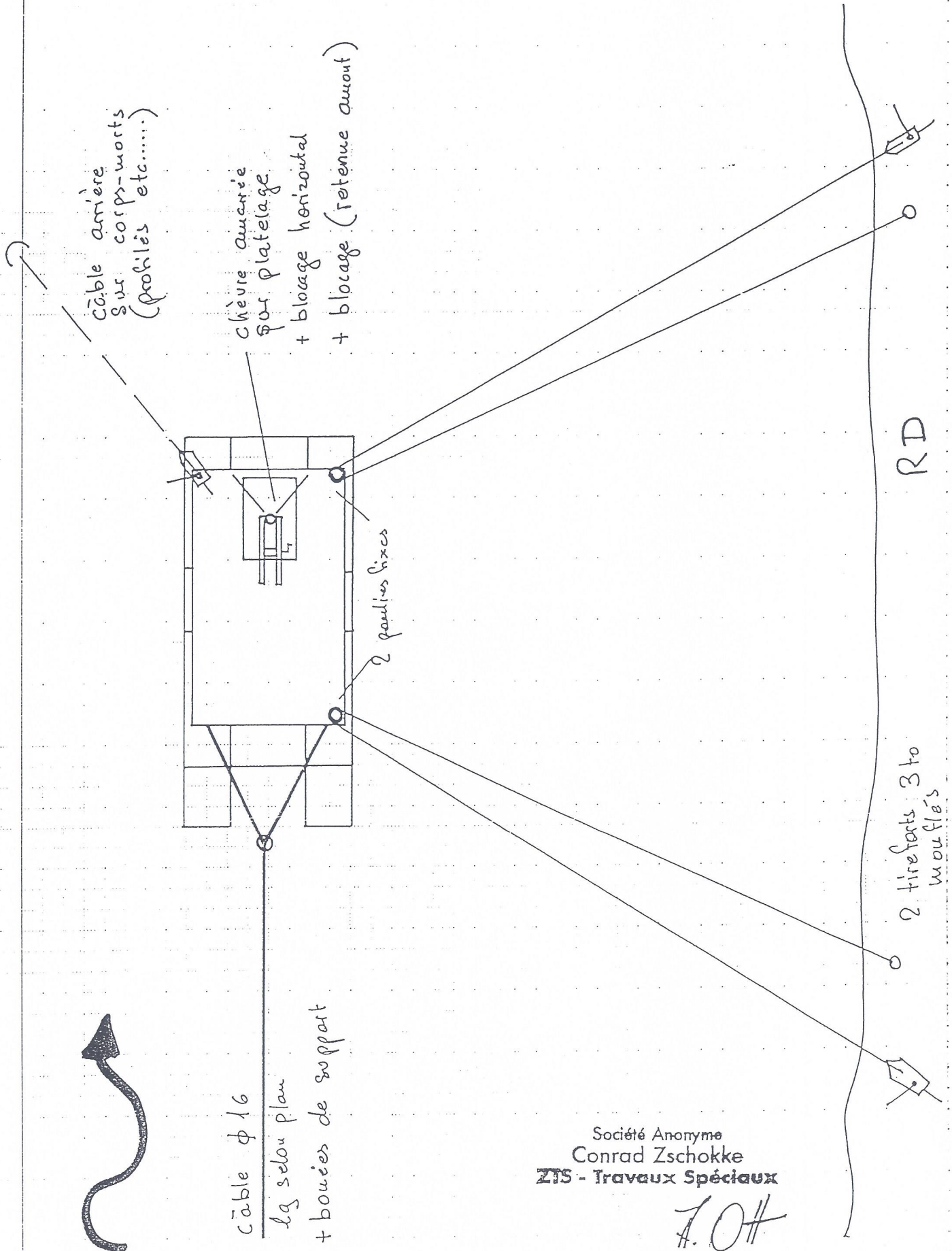
14.5.97

Signe:

OH

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Société Anonyme
Conrad Zschokke
ZTS - Travaux Spéciaux

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Fish Guidance Systems Ltd

Monsieur Valério Zuodar
Président
Federation Genevoise Des Societes De Peche (F.G.S.P.)
Case Postale 312
1211 Geneva 25
Switzerland

7 April 1997

Our Reference DRL/870P0101

Dear Mr Zuodar,

River Rhône Verbois Dam Fish Herding Project

Further to the site inspection carried out by Dr Andrew Turnpenny on 25-26 March 1997, we are pleased to attach a budget quotation for the hire of an acoustic system for use on the River Rhône.

Background

The River Rhône exits from Lake Geneva and passes a number of hydro-electric dams before crossing the French border. One of these, located about 16 km below the city of Geneva, is the Verbois Dam.

Since the construction of the Verbois Dam there has been a progressive accretion of sediment in the reaches upstream of it, and it has proved necessary every three to four years to open the dam and flush out the silt. During this process, the majority of fish that are present in the drained reach are also flushed out and lost downstream to France.

The repeating of the process at three to four year intervals means that much of the fish stock is lost just as soon as it becomes established.

Aims of the Proposed Project

A solution to the fish loss problem is being sought by Geneva's angling federation, Federation Genevoise Des Societes De Peche (FGSP).

Fish Guidance Systems Ltd was approached by the Federation and their consulting fishery biologist, Dr J-F Rubin, to consider the feasibility of using recently-developed underwater sound generating systems to herd fish from the drain-down reach to areas of safety upstream before the flushing process.

Once driven upstream, the fish would be retained by the sound field in the safe area, until the flushing process was complete. After this, the sound field would be removed, and the fish allowed to spread back downstream.

Site Visit of 25-26 March 1997

FGSP invited FGS fishery biologist Dr Andrew Turnpenny to visit the area on the above dates in order to consider the feasibility of the proposed scheme. Dr Turnpenny visited the Verbois Dam and some key points on the river, by road, on the afternoon of 25 March and, the following morning, was taken by boat to see the river in more detail. Here are a number of points of information:

1. The river has a mixed fishery of trout and cyprinid fish, with trout to about 40 cm.
2. The affected reach of the river is about 16 km in length but FGSP intends, at this experimental stage, to attempt to rescue only the fish in the upper 8 km, where the river is narrower. To attempt to cover the whole 16 km is considered too ambitious at the first try.
3. Velocity in the upper 8 km of river is generally high, which may limit effective rescue to the larger (but more valuable) fish. During the drain-down period high flows are used to dislodge silt; combined with the reduced depth, velocities can be much higher, e.g. 2 m/s. Detailed flow-velocity data were provided to FGS.
4. The river has a relatively uniform cross-section along the 8 km reach. Width of the river varies from 120 to 195 m; depth is up to 19 m, shallower towards the margins. A series of cross-sections was provided to FGS.
5. The margins of the river are well provided with cover, including areas of reed bed and submerged tree branches and roots.
6. Fish are found chiefly near to the sides of the river, rather than in the faster-flowing centre region.

Biological Aspects of Fish Diversion

The premise of the FGS guidance concept is that a sound signal can be generated that will be repellent to all swim-bladder species, making it possible to deflect the fish away from areas they are not wanted.

Fundamental behavioural studies by FGS have indicated substantial inter-specific variations in the responses of fish to sound stimuli. The main fish species of concern are a mixed population of cyprinids and salmonids, which are sensitive to sound in the 10 - 1000 Hz range.

The sound signal to be used would be selected from a number of proprietary, broad spectrum deterrence signals that cover the most sensitive hearing band of cyprinids and salmonids and will be within the audible range of humans.

Acoustic Systems

FGS fish deflection systems comprise of the following components:

- 1. The Signal Generator**
FGS signal generators are based on solid-state digital recording technology and can accommodate up to eight separate switchable fish guidance signals.
- 2. Power Amplifiers**
The signal generator feeds into a bank of audio frequency power amplifiers that boost signal levels to the required output levels for the transducers.
- 3. Sound Transducers**
Underwater sound projectors are used to create the underwater sound field. Generally, a linear array of sound projectors is used to create a field of repulsion. We refer to this array as the 'Sound Projector Array' or SPA.

Proposed Method of Approach

The herding process will involve towing sound generating systems upstream from the lower end of the 8 km reach (Profile P12) to the upper containment point at the Bridge with Profile P3A-4A-4B.

The speed will be kept low (1 km/h or ~27 cm/s) in order to avoid exhausting or panicking the fish. The distribution of fish, chiefly at the sides of the river, suggests that the most effective way will be to use two boats, each towing a sound source, one on each side of the river. The scheme is fully illustrated in Figures 1-5 (attached).

It will be seen from the sketches provided that each of the sound sources may be comprised of a number of sound projector units to create the necessary power level, these being suspended from a raft towed behind the boat. The exact number, deployment depth and operating power of the sound sources will need to be determined by acoustic modelling (Subacoustech PrISM Model) before the final arrangement can be confirmed.

Monsieur Valério Zuodar
Federation Genevoise Des Societes De Peche

The signal generators and amplifiers will also be located on the rafts, with power being provided from portable 1.5 kVA 240 v ac petrol generators (plus backup generators in case of failure).

Once the final position has been reached at the upper bridge, the two rafts will be moored from the bridge piers, as shown in Figure 5. The portable generators will be replaced by mains power via land-line from the bridge. The two acoustic systems are expected to remain in this position for about 3-4 days, while the dam is open.

There are a number of factors which may effect the efficiency of the herding process:

The velocities within the channel are high, and the fish must have the swimming capacity to swim against the flow of the river to reach the holding point. Once the dam is opened the velocities will be increased even further.

Since reed beds and other potential cover are present along the banks of the river, the fish may seek refuge in this cover while the acoustic system passes by, returning to the river once the system has moved upstream. Alternatively, the fish may pass between the two boats where the sound field may be reduced, due to interference between the separate acoustic signals.

It is therefore expected that a proportion of fish, especially smaller individuals, will not be saved by the herding process. It is understood that FGSP will be arranging to monitor the distribution of fish throughout the process using sonar technology.

PrISM Modelling Requirements

The PrISM acoustic model will be run for three selected, representative transects to determine the optimum system configuration and operating positions. It is expected that operating two separate sound projector clusters will inevitably lead to some interference of the sound field in the centre of the river, but this is not considered to be of overriding importance, given the marginal distribution of the fish.

The PrISM Model is the property of Subacoustech Ltd, a company specialising in underwater acoustics, and will be run by Subacoustech under subcontract.

Equipment Requirements

The following requirements are expected, but may be altered subject to the outcome of the PrISM modelling:

Monsieur Valério Zuodar
Federation Genevoise Des Societes De Peche

To be supplied by Fish Guidance Systems Ltd:

- 2 off FGS Model 1-08 Signal Control Units
- 4 off FGS Model 400 Amplifier-Monitor Units
- 8 off FGS Model 30-600 Sound Projectors
- 2 off cable harnesses and connector sets.
- 2 off purpose-built mild steel sound projector suspension frames (see Fig. 1)
- 2 off environmental housings for acoustic control equipment.

To be supplied by FGSP:

- 2 off rafts for sound projector suspension, with lifting frame, winch and cable for sound projector frames
- 2 off tow lines
- 4 off portable 1.5 kVA 240 v ac petrol generators plus fuel for 1 day
- 2 off towing vessels
- 2 off power cables at the bridge at profile location P3A-4A-4B, each with a single phase 1.5 kVA, 230 V ac power supply
- 2 off chains and mounting points to attach the rafts to at the holding bridge

Staffing Requirements

We consider that two FGS members of staff should be present for the initial setting up period and for the 2-boat tow. Once the rafts are in fixed position, a single FGS technician will be sufficient, provided that FGSP can provide other personnel to meet safety requirements for working on the river.

Timetable

- 27th May: Equipment dispatched from UK
- 28th May: FGS staff fly out from UK
- 29-30th May: Equipment assembled, tested and made ready
- 31st May: Tow sound systems up-river and herd fish
- 1st -3rd June: Rafts remain in position during drain-down
- 4th June: System dismantled and dispatched back to UK.

Assumptions

In the preparation of this budget quotation we have assumed:

Eight FGS 30-600 sound projectors and associated control equipment will be sufficient to herd the fish. The final system specification will be dependant on the PrISM modelling.

Monsieur Valério Zuodar
Federation Genevoise Des Societes De Peche

The electricity supplies from the generators and power cables will be uninterrupted, and not subject to excessive voltage fluctuation.

Since the deployment frames will be specific to this project, they will be purchased by FGSP, while the remaining components of the acoustic system will be hired.

Delivery

The acoustic system quoted is in stock, however the system specification must be first confirmed by PrISM modelling. Once the system specification has been confirmed the deployment frames will have to be fabricated. We will therefore require an order to proceed with the PrISM modelling by 14 April 1997.

Once the results of the PrISM modelling are known, we will confirm the system specification and hire cost. In order that the system is available for shipment on 27th May, we will require an order to proceed with the fabrication of the frames by 6 May 1997.

Purchase Options

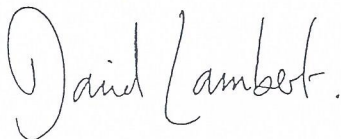
FGS systems are available to be either purchased, leased or hired. We have attached a quotation for the hire of the system, which we understand is your preferred option.

Terms and Conditions

FGS terms and conditions relating to the hire of FGS acoustic equipment are attached to this budget price.

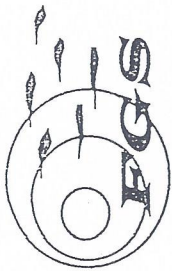
I trust we have provided all the information you require at this stage, however if you have any queries, or require any further information, please do not hesitate to contact us.

Yours sincerely



Dr D R Lambert
General Manager

cc. Dr J.- F. Rubin



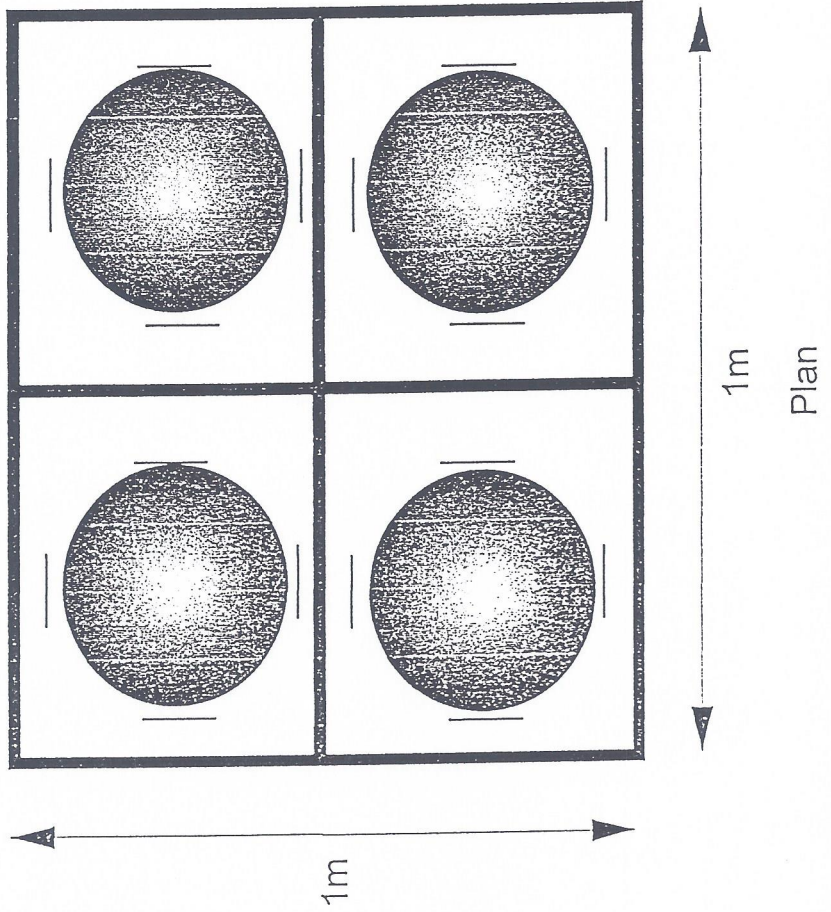
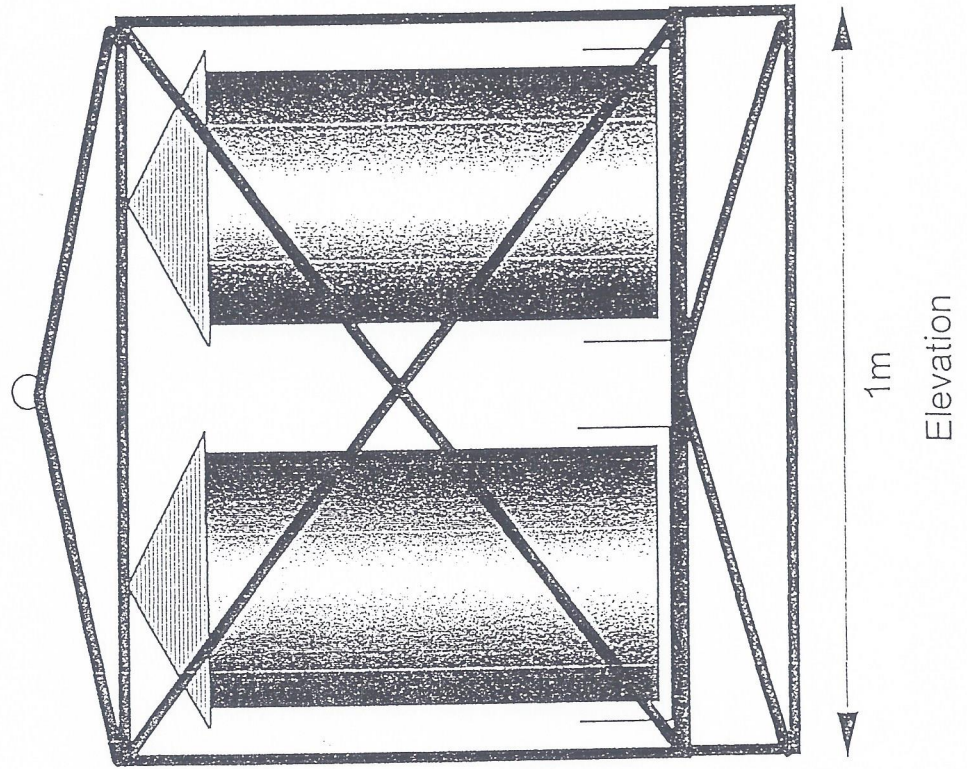
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Winchester Road
Bishops Waltham
SO32 1AH
Tel: 01489-893323
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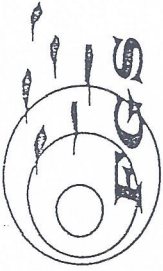
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Project No. 870

Figure 1: Sketch of Sound Projector Frame with 4 Model 30-600 Sound Projectors

Note frames made from 50 mm mild steel angle, painted.





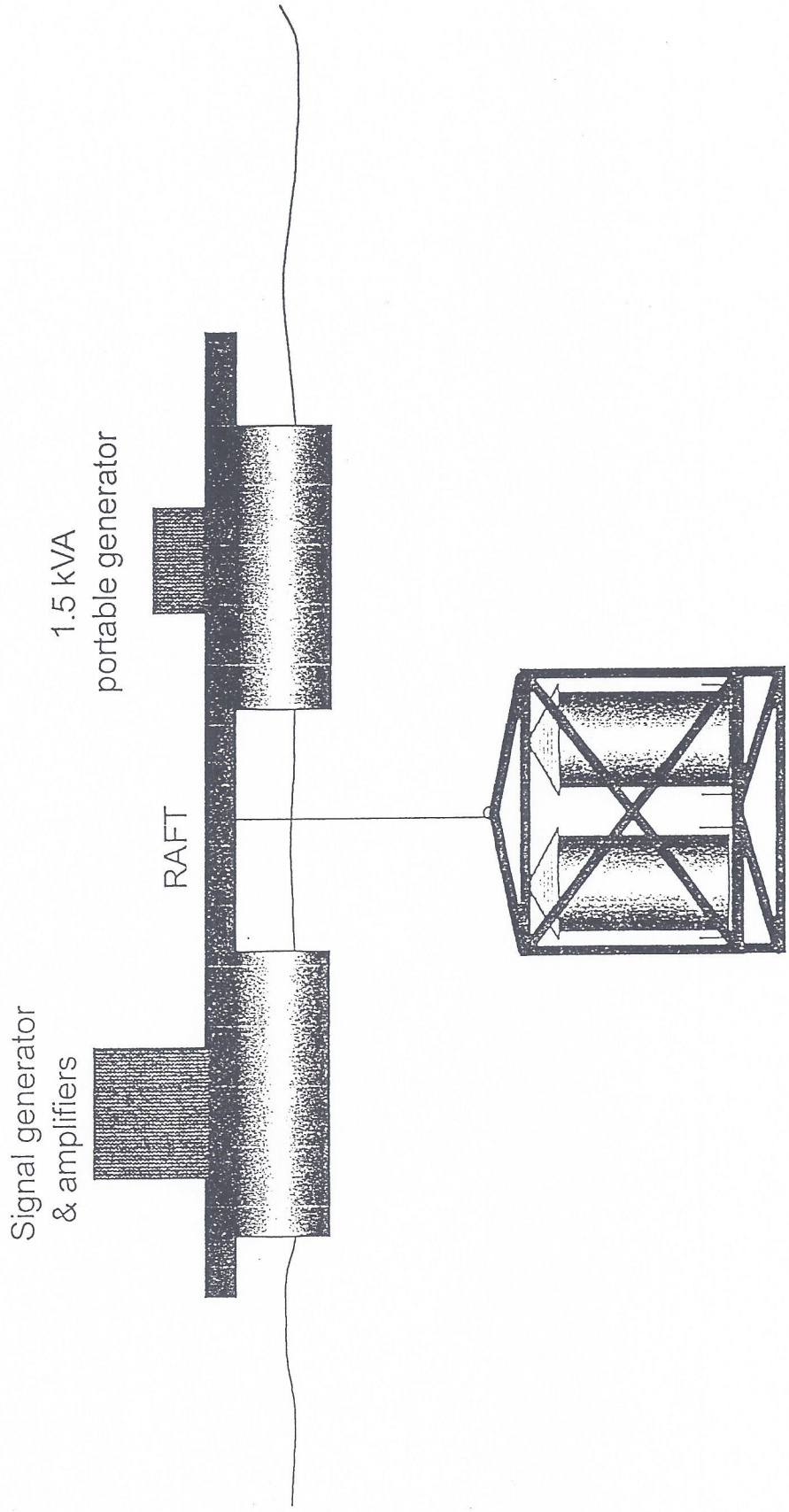
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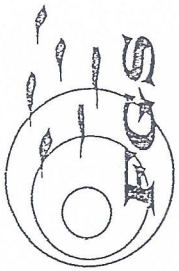
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Figure 2: Sketch showing suspension of the sound projector frame from the raft





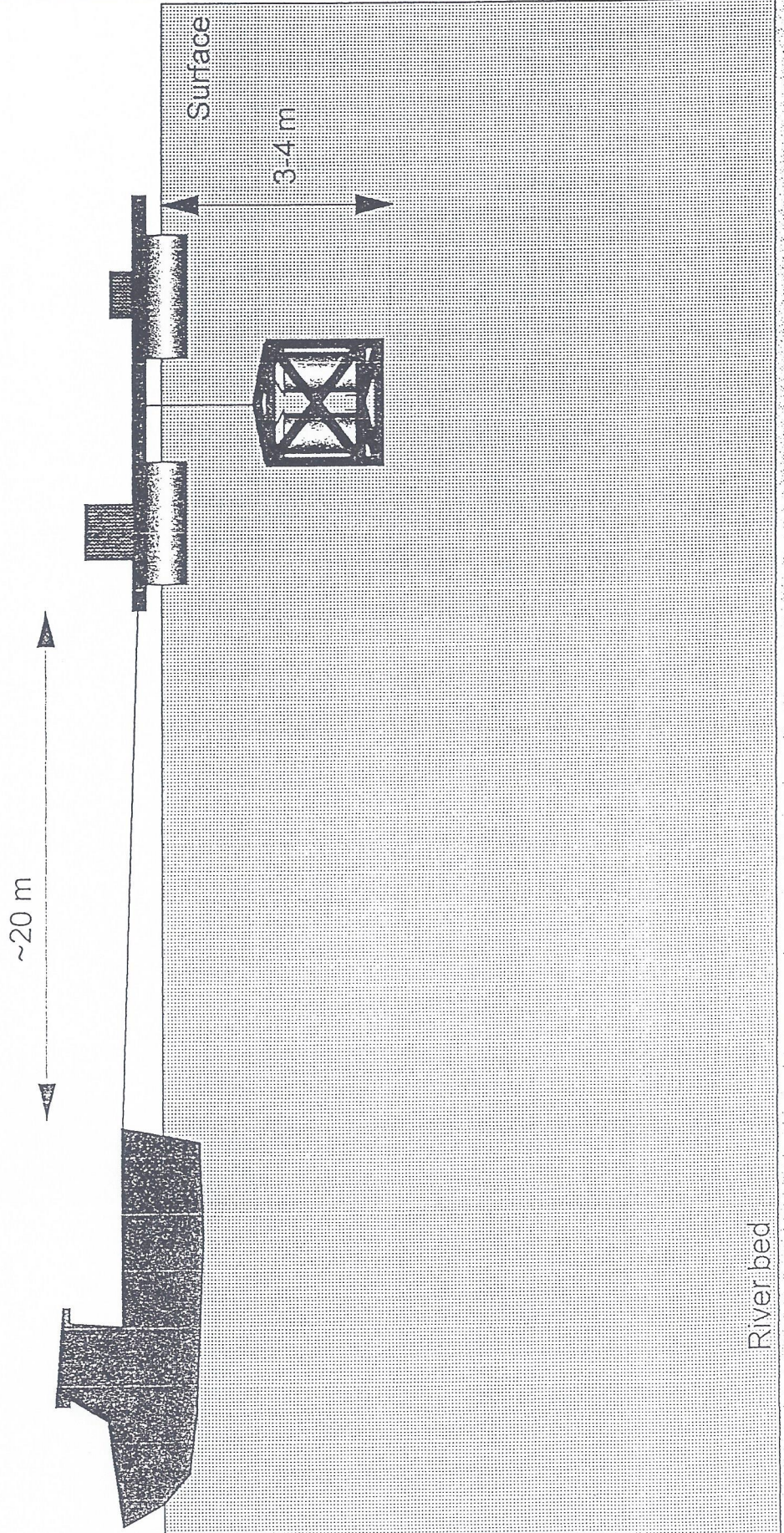
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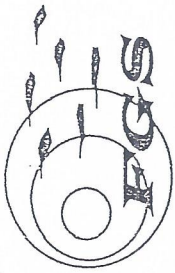
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Project No. 870

Figure 3: Towing Arrangement (section)



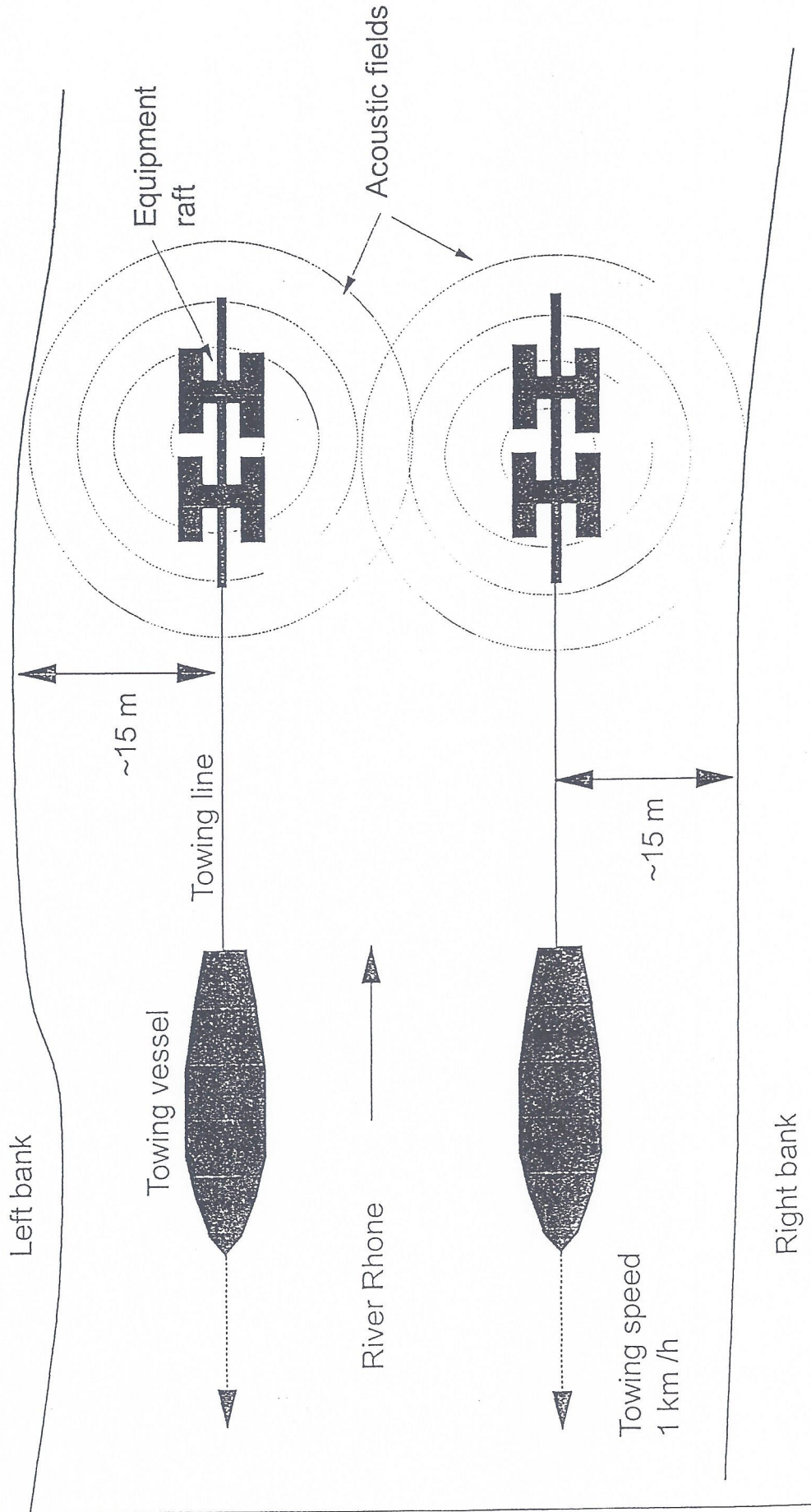


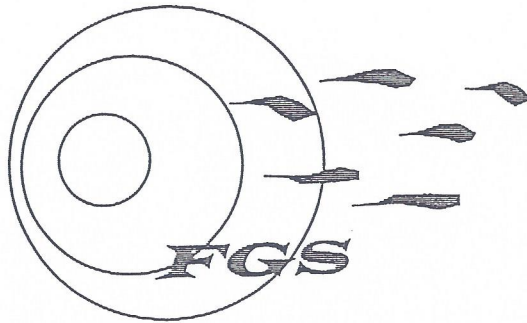
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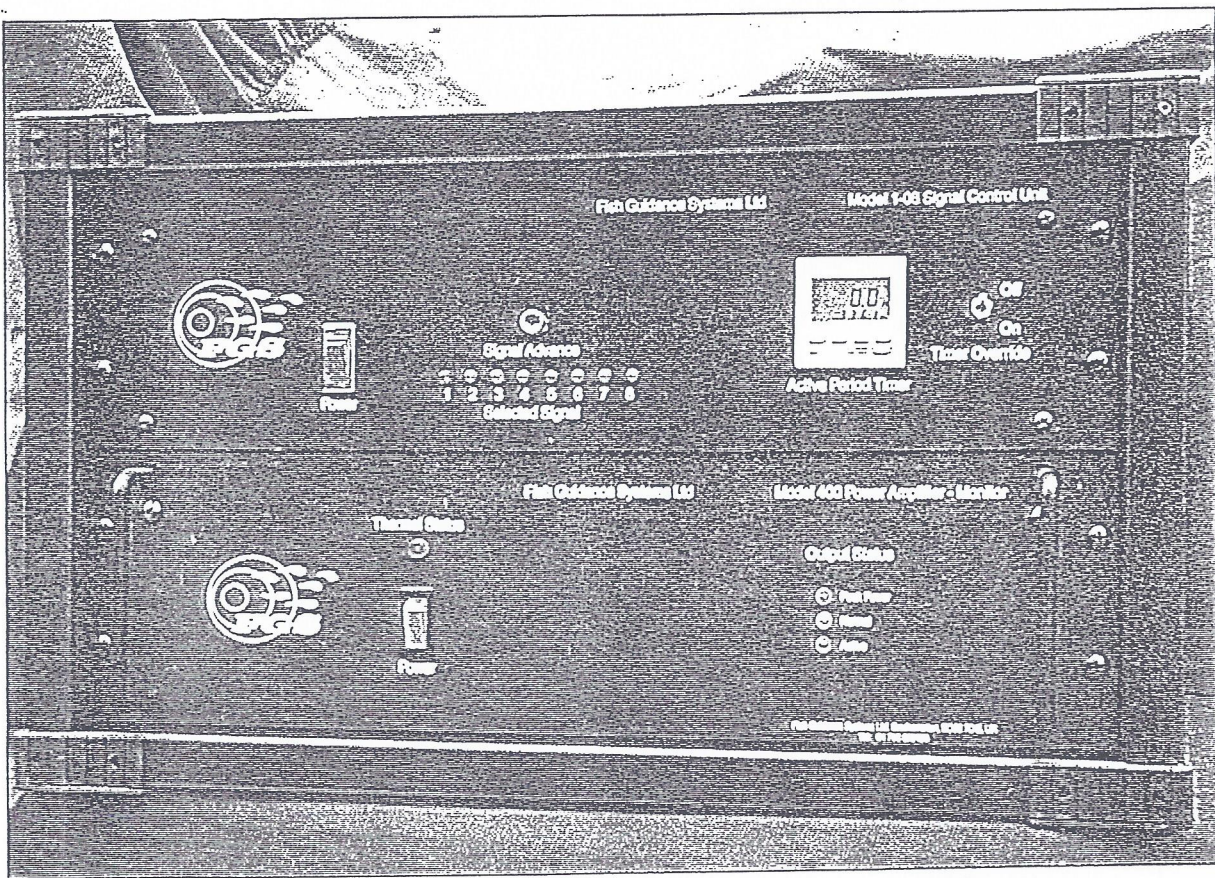
Figure 4: Towing arrangement (plan view)





Fish Guidance Systems Ltd

The FGS Model 1-08 Signal Control Unit & Model 400 Amplifier / Monitor



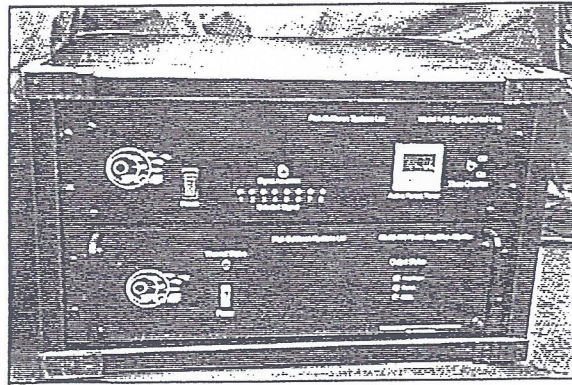
At the heart of the acoustic fish guidance system are the signal generator and power amplifier modules. The Model 1-08 Signal Control Unit and the Model 400 Amplifier/Monitor have been developed specifically for fish guidance applications.

The Model 1-08 Signal Control Unit

The Model 1-08 Signal Control Unit uses solid-state digital recording technology to hold and play back up to eight fish guidance signals. Each signal can be manually selected and run continuously, or a pre-timed sequence of signals can be selected. Multiple signals are used, for example, where it is required to deflect a resident, non-migratory population which, after protracted exposure, might become accustomed to a single signal: the signal sequence can be operated so as to minimise this effect. It also provides the opportunity to change the signal seasonally in order to provide optimum effectiveness for a sequence of species or life stages. The timer may also be configured to generate a programme of sound-on and sound-off periods, for example for night-time only operation.

For most installations, a single Model 1-08 unit, which will drive up to six Model 400 Amplifier/Monitor units, is adequate. For larger configurations, additional output amplification can be provided.

The Model 1-08, like the Model 400, is supplied in standard 19-inch rack-mount form, for installation in a 19-inch instrument rack or environmental housing.



Model 1-08 - Brief Specification

Type: solid-state digital recording on EPROM via 8-bit word

Max. output voltage: 1V RMS

Max. signal length: 32k words

Frequency range: 20 - 10k Hz

Max. No. pre-recorded signals: 8

Timer: any of 10 min on/off periods over 24 hour period or 1 hour on/off periods over 7 days

Power requirements: 240V AC, single phase, 0.5KVA

The Model 400 Amplifier/Monitor

The Model 400 is the power-house of the system, boosting the deflection signal for delivery to the sound projectors. Not just an amplifier, the Model 400 performs a series of essential monitoring functions to ensure the system's smooth performance. A number of LED indicators on the front panel of the unit display essential information about the operational integrity and function of the system, while further diagnostic information is provided for the benefit of our engineers.

One Model 400 unit is normally sufficient to power two Model 30-Series sound projectors, or up to eight Model 15-Series units.

As with the Model 1-08 Signal Control Unit, the Model 400 is supplied in rack-mount form, with internal cooling fans. Owing to high heat rejection, it is essential that the mounting rack or housing is well ventilated. In the event of overheating, however, the Model 400 has full thermal overload protection.

Model 400 - Brief Specification:

Power output:

455W RMS into 4 ohms

305W RMS into 8 ohms

Power bandwidth: -3 dB, 1Hz - 100kHz

Damping factor: >300

Slew rate: 70V/ μ sec

Input sensitivity: 500mV RMS

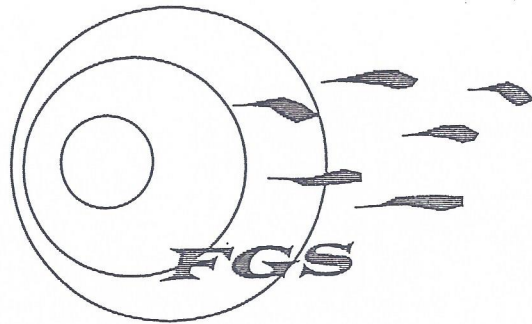
Input impedance: 100kohms

Signal-to-noise ratio: 110dB

Power requirements: 240V AC, single phase, 1KVA

For further information on any aspect of acoustic fish guidance, contact us at:

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Burnetts Lane
Horton Heath
Hampshire SO50 7DG
Tel: +44(0) 1703 602428
Fax: +44(0) 1703 602101



Fish Guidance Systems Ltd

The FGS 15 and 30 Series Sound Projectors



Introducing the FGS 15 and 30 Series Underwater Sound Projectors - the first British-made transducers designed specifically to meet the needs of acoustic fish guidance and deflection, built to quality and performance standards matched to their task.

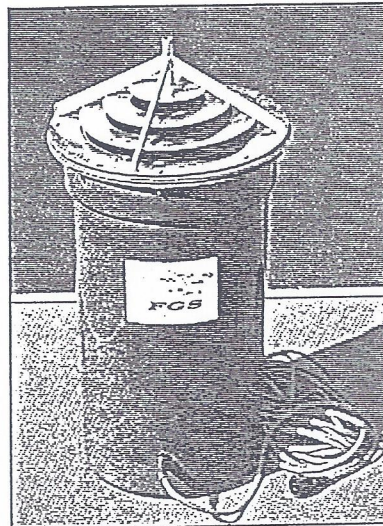
The Model 30-Series Sound Projectors

Suited to larger scale applications, the 30-Series units are made in 300W and 600W versions, according to power requirements. The units feature electromagnet transducers which have a proven track record for reliability and performance in fish guidance applications. A double-skinned, glass-reinforced plastic housing provides a rugged containment which is suited to marine and freshwater installations. The sound-generating surface is a flexible neoprene membrane, and this is protected from external mechanical damage by a conical grill of concentric rings manufactured from marine-grade stainless steel.

Automatic depth-compensation is an additional feature of the Model 30-Series. An internal compliant air reservoir provides dynamic pressure compensation over a 20:1 range, easily coping with tidal ranges in most marine locations and absorbing higher frequency changes caused by turbulence and wave action.

With a frequency range of 10-600Hz (+or- 3dB), the Model 30-Series acts as an omni-directional radiator and can be used in arrays or other configurations to create extensive sound fields.

Where multiple units are used, the FGS Prism Acoustic Model may be used to attain optimum performance.



Model 30-Series - Brief Specification:

Maximum dimensions: 770 (H) x 385 (OD) mm

Power rating: 300 or 600W RMS

Source level: 168dB 1 μ Pa @ 1m (300W)

Source level: 174dB 1 μ Pa @ 1m (600W)

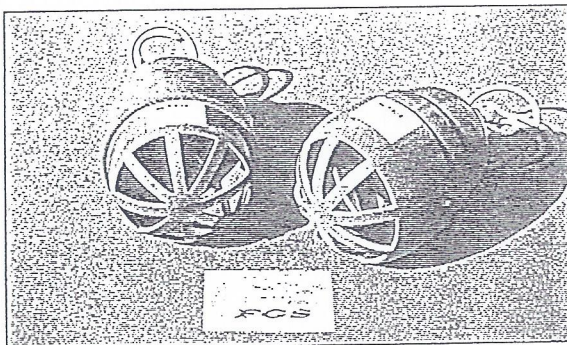
Frequency range: 10-600 Hz (+or- 3dB)

Pressure compensation: ratio of 20:1

Max. operating depth: 30 m

The Model 15-Series Sound Projectors

Small but very rugged, the Model 15-Series is designed for smaller applications, or where a more finely-controlled sound field is required.



In spite of its size, the Model 15-Series packs a fair punch, delivering a sound pressure level adequate for protecting an area of up to 3m radius or more (depending on species and water conditions) over a 100-600 Hz frequency band.

The Model 15-Series is primarily intended for freshwater applications, having a lower pressure compensation range which is intended to cope with the depth fluctuations normally found in small lakes and rivers.

Nevertheless, the Model 15 is fully marine resistant and can be used in tidal waters when suspended from a buoy or float to maintain a constant immersion depth.

The Model 15 is housed in a resilient GRP capsule which is pre-pressurised to the required operating depth. An integral mounting plate with four stainless steel threaded bushes allows for convenient fixing.

Model 15-Series - Brief Specification:

Maximum dimensions: 320 (L) x 190 (OD) mm

Power rating: 100W RMS

Source level: 164 dB re 1 μ Pa @ 1m

Frequency range: 100-600 Hz (+or- 2dB)

Pressure compensation: pre-pressurised to operating depth

For further information on any aspect of acoustic fish guidance, contact us at:

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	<u>FAX</u>	<u>TEL</u>	RESPONSABLE
<u>24 heures de Lausanne</u>	* 3.494.110		
<u>Dauphiné</u>	* 059.450.377.082	* 059.450.925.252	
<u>Extension</u>	* 3.015.842	* 3.015.830	
<u>GHI</u>	* 3.287.727	* 3.287.344	
<u>J.de Geneve et Gaz. Laus.</u>	* 8.198.989	* 8.198.888	
<u>Le Courrier</u>	* 3.294.274	* 8.095.566	
<u>Le Genevois</u>	* 3.114.296	* 3.104.296	
<u>Le Matin</u>	* 3.283.078	* 3.283.035	
<u>Le Nouveau Quotidien</u>	* 3.212.833		
<u>M.J.-P. Mc.Donald</u>	* 0 042.027.249.162	nat 079 4.485.740	
<u>Messenger</u>	* 059.450.387.239	* 059.450.925.400	
<u>Quotidien de la Côte, Nyon</u>	* 3.621.308		
<u>Radio Chérie FM</u>	* 059.450.952.825	* 059.450.952.858	
<u>Radio Energie</u>	* 059.450.952.825	* 059.450.958.181	
<u>Radio Europe 2</u>	* 059.450.221.069	* 059.450.222.456	
<u>Radio Nostalgie</u>	* 059.450.958.816	* 059.450.878.685	
<u>Tribune de Genève</u>	* 3.215.972	* 3.224.000	
<u>TSR</u>	* 3.293.333		
<u>Lax Video</u>	* 059.450.927.082	* 059.450.872.761	
<u>Sillon Romand</u>	* 021 3 494 079		