



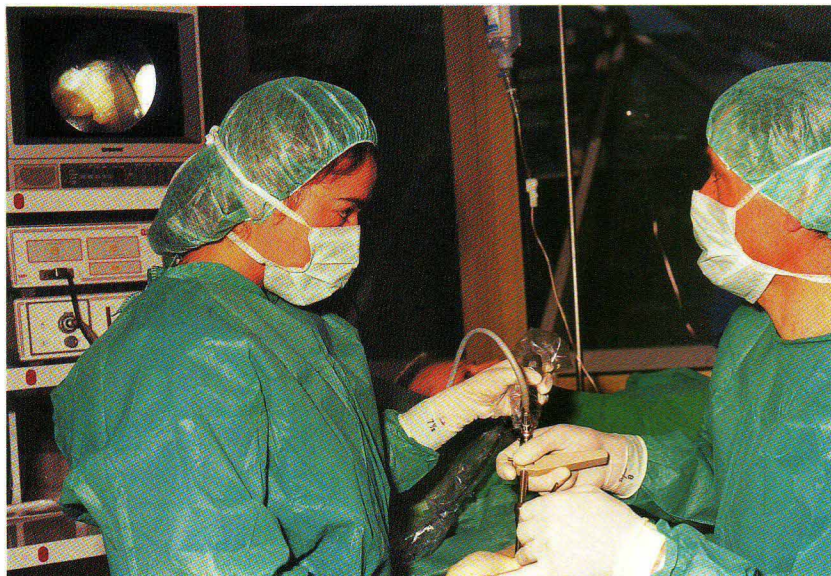
Endoscopic Carpal Tunnel Release

with the ENDO-CARTRIS®

Endoscopic Carpal Tunnel Release

with the ENDO-CARTRIS®

ENDOscopic CARpal Tunnel Release Instrument Set



Major developments have been made recently in endoscopic carpal tunnel release. To refine this method and to make it safer and with less morbidity, we have developed a new instrument set.

The unique ENDO CARTRIS® instrument set resulted from close cooperation with leading surgeons and from our many years of experience and know-how in endoscopy. It allows endoscopic treatment of carpal tunnel syndrome in a single intervention with less patient trauma.

This means that the patient can resume normal activity with the hand earlier due to greatly reduced postoperative morbidity.

The ENDO-CARTRIS® instrument set consists of a telescope guide, a 4 mm standard 25° telescope, an introducing sleeve with obturator, a handle for knife blades and a carpal tunnel dissection probe.

The system can be used with any standard endoscopic video camera and suitable light source. The surgeon introduces the instru-

ment into the carpal tunnel through a small incision in a flexion crease of the wrist.

The telescope guide allows a detailed inspection of the entire width of the flexor retinaculum without changing the position of the instrument.

We decided on the single-portal technique since this was favoured in international publications. The cutting direction from distal to proximal under constant visual control was selected to reduce risks to a minimum.

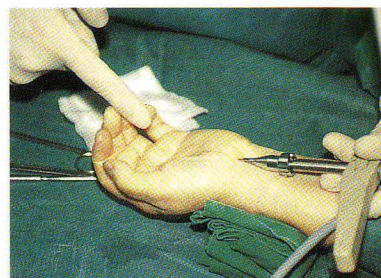
All the characteristics of the modular and universal ENDO-CARTRIS® instrument set guarantees optimum therapeutic success while making economic sense. The ENDO-CARTRIS® instrument set was developed in cooperation with Dr. Tseng¹⁾ and Dr. Koutsos²⁾.

Major features:

- ☐ the intervention can be performed easily by one operator
- ☐ cutting action from proximal to distal (opposite direction also possible on request)
- ☐ telescope transport mechanism for ideal view and controlled cutting
- ☐ ergonomic system for a safe and effective procedure
- ☐ optimum view with the high-resolution PANOVUE PLUS telescope
- ☐ two sizes of atraumatic sleeve for individual cases
- ☐ the whole system can be autoclaved and is therefore re-usable
- ☐ simple instrument care and preparation
- ☐ reduced costs for greater economy
- ☐ the basic system for the single portal technique can also be used for the two portal technique

¹⁾ Victor Tseng M.D.
5501 North 19th Avenue
Suite 331
Phoenix, Arizona 85015
USA

²⁾ Dr. med. J. Koutsos
Centre for Outpatient Plastic and Hand
Surgery
Kortumstraße 87 / 89 (City Point)
44787 Bochum
Germany



Preparations for the Operation

Instrument set

The telescope guide can be used for both the left or right hand. A simple adjustment adapts the instrument holder as required regardless of which hand is being operated on.

Recommended instruments for treatment of carpal tunnel syndrome with the ENDO-CARTRIS®.

We assume that the following basic instrument set is available:

- ☐ two fixation hooks
- ☐ two blunt retractors
- ☐ surgical forceps
- ☐ dissecting scissors
- ☐ scalpel with no. 15 blade
- ☐ sterile water-resistant marker

ENDO-CARTRIS® instrument set

- ☐ 5 mm introducing sleeve with obturator
- ☐ 6 mm introducing sleeve with obturator
- ☐ PANOVIEW PLUS telescope
- ☐ telescope guide
- ☐ carpal tunnel dissecting probe by Koutses
- ☐ palpator
- ☐ handle with knife blades

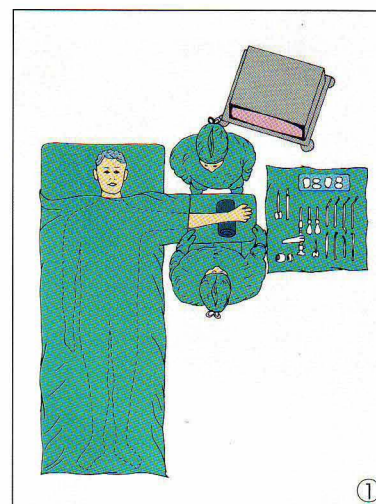
Positioning the devices

The most important preparations include the positioning of the operator to ensure a good view of the monitor and the positioning of the patient's hand. The monitor should be positioned so that it can be seen clearly during all phases of the operation (refer to diagram 1).

It is advisable to check the functions of the assembled instrument set including the video system and light source prior to the anaesthesia.

Depending on the particular case, it is helpful to identify the most important anatomical structures with a sterile marker. These include the flexor carpi ulnaris tendon, flexor carpi radialis tendon, the pisiform bone and the hamulus of the hamate bone.

It is also advisable to mark the skin crease intended for the incision. A line from the planned incision (between the flexor carpi radialis and the flexor carpi ulnaris) to the base of the fourth finger passing the hamulus of the hamate bone on the radial side can also be marked (refer to diagram 2).

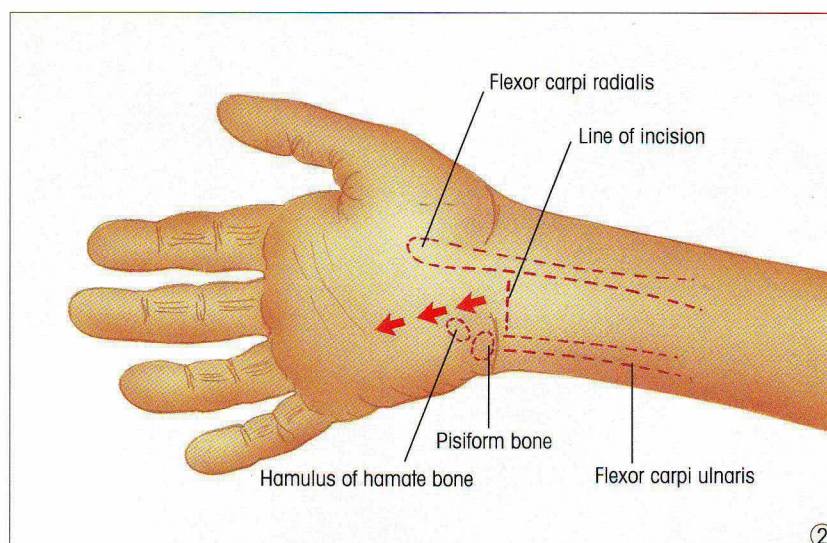


Patient position

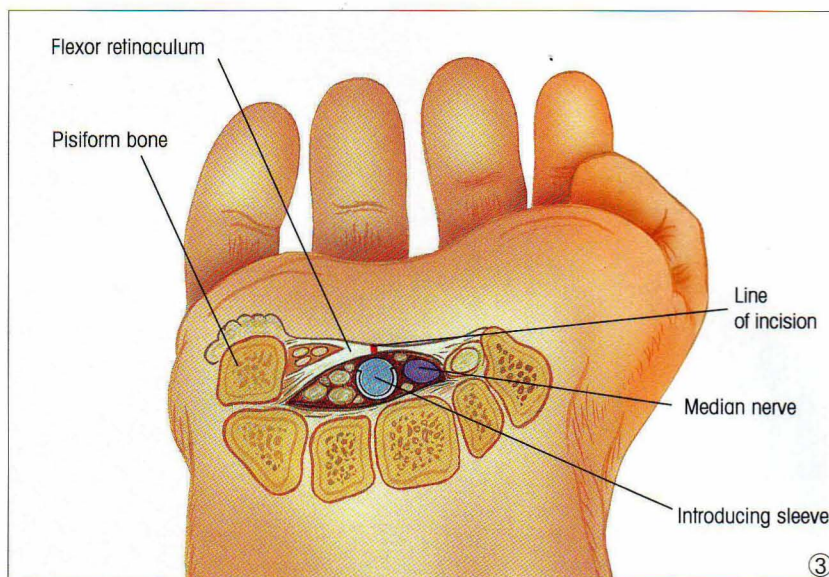
The patient is positioned in the supine position on the table with the arm 70° to 80° abducted. It is advantageous to operate in a bloodless field with the hand, wrist, lower arm and arm being exsanguinated with an Esmarch rubber tourniquet.

Anaesthesia

Both local and general anaesthesia have proved to be suitable.



Initial operating steps



U-shaped incision

Making a U-shaped incision creates a flap which remains connected proximally (the fascia of the lower arm).

This U-shaped incision allows the surgeon direct access to the carpal tunnel between the synovial sheath and the lower side of the flexor retinaculum.

At this point the surgeon must always be aware that the median nerve runs immediately below the flap of fascia on the radial side (refer to diagram 6).

Identification

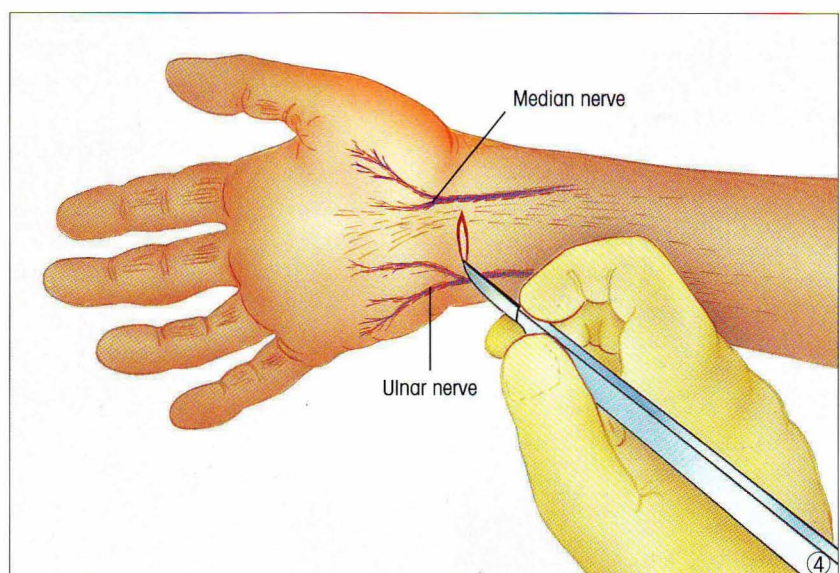
of the most important anatomical structures involved in endoscopic carpal tunnel release (refer to diagram 3).

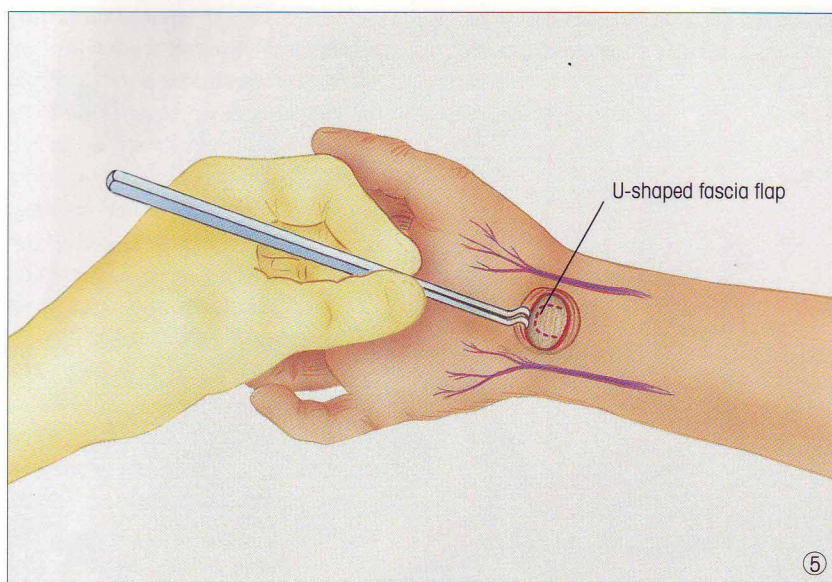
Wrist incision

The incision is made in the flexion crease between the flexor carpi radialis and the flexor carpi ulnaris. A shallow incision is made to avoid damage to the subcutaneous tissue and nerves. The subcutaneous tissue is retracted to divide the fascia taking care not to damage arteries and nerves.

If unusual circumstances demand intra-operative conversion to a conventional procedure, the transverse incision can be extended in both a proximal and distal direction.

The palmar, cutaneous branch of the median nerve can now be identified and exposed in the radial area of the operating field (refer to diagram 4).





Dissecting the entry to the carpal tunnel
(refer to diagram 6)

While raising the dissected flap in a proximal direction, the scissors can be carefully opened to divide the fascia from the synovial

sheath. The carpal tunnel dissecting probe is now introduced.

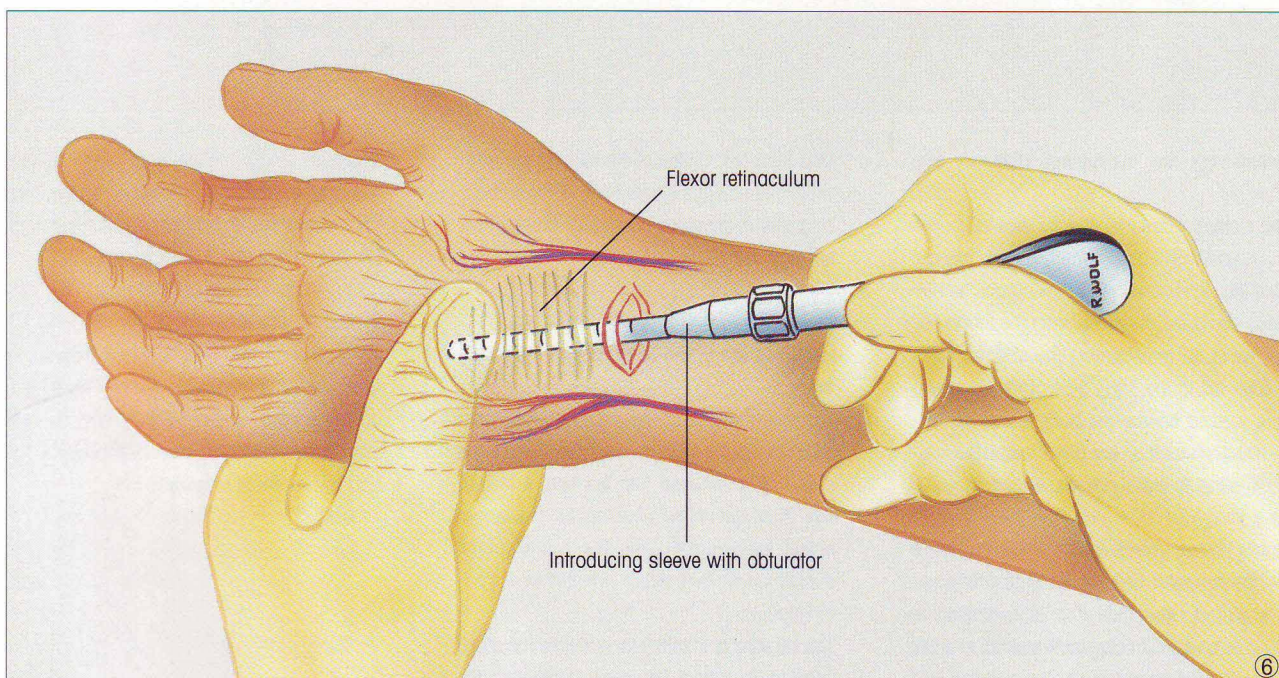
During all manipulations, care must be taken to ensure that the axis of the instrument is aligned with the base of the fourth finger.

The synovium can be divided from the surrounding tissue using the carpal tunnel dissecting probe.

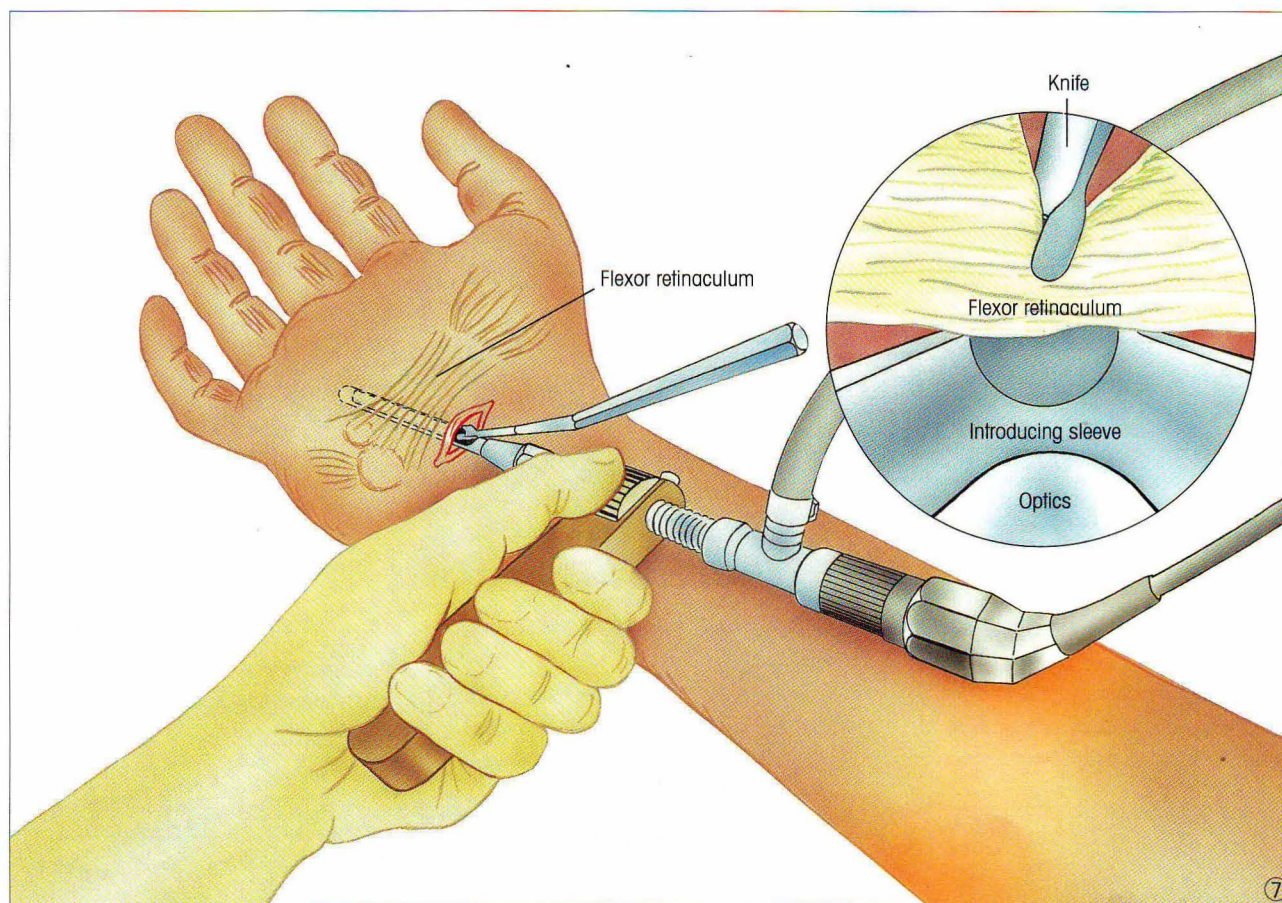
The access for the subsequent procedure is dilated with the thinner introducing sleeve with its obturator in place.

The wrist is kept in slight extension. The dissection is completed on the ulnar side, continuing along the hamulus of the hamate bone. Dilatation is continued until the distal tip of the instrument can be felt at the exit of the carpal tunnel.

If necessary, primary dilatation can be extended by using the larger introducing sleeve.



The operating technique



Introducing the Instrument (refer to diagram 7)

The patient's hand is slightly extended. The assembled ENDO-CARTRIS® system is now carefully introduced into the carpal tunnel. Once again the alignment with the fourth finger must be maintained. The endoscope is guided along the lower side of the ligament. It is located beside the hamulus of the hamate bone ensuring the ulnar route. The telescope is in its distal position.

During these manipulations it is important for the surgeon to hold the patient's hand with his own free hand. This ensures that the hand is always ideally positioned to provide a perfect endoscopic view. The surgeon can

also trace the course of the introducing sleeve with his thumb. Graduation of the introducing sleeve provides additional external orientation.

Identification of the distal edge of the ligament

The proximal end of the carpal tunnel must be exposed and reliably identified before the sleeve is introduced into the carpal tunnel. The ulnar tunnel is now above the carpal tunnel towards the ulna. The carpal tunnel contains synovium which can further aid orientation.

The beginning of fatty tissue marks the distal edge of the carpal ligament. By moving the

telescope along its axis, both the distal and proximal edges of the ligament can be identified easily without adjusting the position of the instrument.

In rare cases, it is difficult to recognise the distal demarcation. In this situation, or if other anatomical variations make orientation difficult, particularly in critical areas, it is advisable to stop the intervention and change to a conventional procedure.

Dividing the ligament

The knife holder is fitted with the appropriate knife. The knife is aligned with the fourth finger as mentioned earlier. Ideally division begins at the proximal edge of the flexor retinaculum. The introducing sleeve is located beside the hamate bone and is therefore on the ulnar side of the carpal tunnel. The longitudinal groove of the introducing sleeve is directly beside the ligament.

Once this position has been achieved and all the features can be recognised in detail on the monitor, the ligament is divided by slowly advancing the knife. The cutting procedure must be carefully controlled at all times. If necessary, the telescope position can be readjusted to ensure a perfect view. This also helps to prevent injury to important structures.

Checking the divided ligament

A final check of the cut edges of the ligament is made by advancing and retracting the telescope. If the ligament is not completely divided, the situation can be remedied very simply.

In addition to the visual inspection using the monitor, the complete division of the ligament can also be checked by palpating the edges with the carpal tunnel dissecting probe or the palpator as well as by looking directly into the expanded carpal tunnel.

Completing the operation

The operation is completed as usual.

After the final inspection and removal of the ENDO-CARTRIS® the incision is closed.

Postoperatively, the hand is immobilised in a plaster cast for about six days. This is followed by physiotherapy.

A video cassette illustrating the method is available.

We will be happy to send you information about courses and workshops planned on request.



Endoscopic carpal tunnel release

We would like to thank Dr. Koutsos and Dr. Tseng for their support in producing this brochure. It does not claim to be complete and does not take into account continuing developments or modifications. This description of the technique is not intended to take the place of courses designed to teach the method.

RICHARD WOLF GmbH · D-75434 Knittlingen · PF 1164 · Phone ++49 7043 - 35-0 · Fax ++49 7043 - 3 53 00 · GERMANY

USA

RICHARD WOLF
Medical Instruments Corp.
353 Corporate Woods Parkway
Vernon Hills, Illinois 60061
Tel.: 708-913 1113
Fax: 708-913 1489

UK:

RICHARD WOLF U.K. Ltd.
P.O. Box 47
Mitcham
Surrey CR 4 4TT
Tel.: 081-640-3054
Fax: 081-640-9709

BELGIUM:

N.V. Endoscopie
RICHARD WOLF Belgium S.A.
Industriezone Drongen, Landegemstraat 6
B-9031 Gent-Drongen
Tel.: 09-282.92.15
Fax: 09-282.92.16

FRANCE:

RICHARD WOLF France S.A.R.L.
Rue Daniel Berger
Z.A.C. La Neuville
F-51100 Reims
Tél.: 26-87 02 89
Fax: 26-87 60 33

AUSTRIA:

RICHARD WOLF Austria
Ges.m.b.H.
Lederergasse 32
A-1082 Wien
Tel.: 0 222-405 62 19
Fax: 0 222-408 70 84