Instructions for use of the DENTATUS ARTICULATOR TYPE ARH
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for use of the
DENTATUS® ARTICULATOR TYPE ARH

Stockholm 1984
FOREWORD

Your DENTATUS ARTICULATOR is designed to meet the requirements of the most exacting user, having been planned to professional standards from its inception. It incorporates a new and different approach to Articulator design. A great many of its features, controls and calibrations will be new to you.

The first DENTATUS ARTICULATOR was designed and manufactured in the early forties. Thus the DENTATUS ARTICULATORS have been used all over the world for more than 40 years. By the beginning of world war two at the end of 1939 import of, among other things, dental instruments from the USA to Europe ceased. The necessity of obtaining suitable and also improved articulators became mandatory.

Therefore, upon urging from the Dental Profession in Scandinavia, the Swedish Dental Supply and Manufacturing Co. AB DENTATUS took the initiative of starting the manufacture of an adjustable Dental Articulator.

Many new and better features for a practical adjustable dental articulating instrument with much improved tolerances for its moving parts were initially added to the fabrication of the new born DENTATUS ARTICULATOR. Since that time innumerable improvements have been added to the original design to make it more robust and give it considerable sturdiness. Still more improvements were made to make the instrument more versatile by introducing increased Bennett-Angle adjustments, the new Adjustable Articulator Axis, more secure and definite seating of Improved Mounting Plates, etc., etc. All these changes have made the DENTATUS ARTICULATOR the IDEAL INSTRUMENT for a great number of dental treatments concerned with Occlusion and Articulation of teeth. It is a Necessity in the Functional Analysis of Occlusion, Diagnosis and Treatment Planning as well as in Fixed and Removable Prosthesis.

The purpose of the Instruction Book is to act as a friendly guide in introducing your new DENTATUS ARTICULATOR to you.

We are as eager as you to have your DENTATUS ARTICULATOR operate satisfactorily in every detail, and hope that you will acquire a good working knowledge by reading the following pages with care.

We also suggest that you keep this Instruction Book handy for future references.
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REPRODUCTION OF JAW MOVEMENTS

The anatomical form of the temporomandibular articulation including its ligaments as well as the shape of the occlusal surfaces and the anterior guidance of the dentition determine the paths of movement between each pair of opposing teeth. Other determining factors are the various widths between the condyle paths, their inclinations in relation to the masticatory surfaces and the distance between each individual tooth and the centers of movement.

Numerous so-called mean value articulators are on the market. Their construction is based upon average measurements of the above mentioned factors, accordingly, their movement pattern is fixed; they will purportedly move in a pattern of the average jaw movements in the human species. Since variations in size and appearance occur in all parts of the human body including the masticatory system, it is inconceivable that the mandibular movement could be standardized in a mean value articulator. Averages do not fit the individual. Obviously the mean value articulators are definitely inadequate for accurate analysis of occlusion and articulation in natural dentitions. This is also true in full denture construction. The mean value articulators will fail, in most cases, when they are used for the purpose of final correction of occlusal disharmonies, which is a MANDATORY procedure in full denture prosthesis for optimum function and denture comfort.

The importance and necessity of good occlusion and articulation with correct direction and distribution of stresses etc. have required an adequate imitation of the individual jaw movements. The individually adjustable DENTATUS ARTICULATOR fulfills such requirement. It can be used for the satisfactory solution of occlusal problems in both natural dentitions and artificial dentures. The DENTATUS ARTICULATOR will give an exceedingly accurate simulation of mandibular movements both because it is possible to orient the casts in correct relation to the center of movement and also because the Condylar Tracks can be adjusted both horizontally and laterally. The orientation of the upper cast is made from a Face Bow Registration. The lower cast is mounted from a centric jaw relation record. Protrusive jaw relation records serve for the individual setting of the Condylar Track Inclinations horizontally. The Bennett shift or lateral setting is determined either arbitrarily or by means of lateral jaw relation records. For various reasons no Articulator can accurately duplicate all actual jaw movements. This is readily evident because the jaw mechanism is not a rigid mechanical system, but contains differently yielding tissues.

The Articulator cannot be an “anatomical replica” of the masticatory system and the temporomandibular articulation. It reproduces, however, the position of the mandible to the maxillae in the registered functional jaw positions and it will closely approximate the movement paths between these positions. This is the main reason why it does not pay to complicate the Articulator beyond a certain extent. The Articulator would then become impracticable and difficult to handle without offering corresponding advantages. Therefore the individually adjustable DENTATUS ARTICULATORS have no adjustments to vary the intercondylar distance. An adjustable intercondylar distance is according to the newest research 1980–82 by Drs. R. Lee and R. Slavicek of no functional or practical advantage. For practical purposes the Condylar Tracks are inverted in the Dentatus ARH Articulator.

Investigations have shown the effect of these simplifications to be of practically no importance in the precision of the technique. This can be shown both from a theoretical consideration and also from practical studies. The criticism of the attainable accuracy with which the Articulator will reproduce the functional mandibular movements — closing and contact gliding movements — is highly disputable. If the Articulator technique, registrations, etc. are based upon sound physiologic principles, the use of the DENTATUS ARTICULATOR shows overwhelmingly comprehensive and elucidating proof of accuracy. It is certainly in a great measure responsible for the excellent result attained in all types of denture construction, crown and bridge work as well as full-mouth rehabilitation.

The DENTATUS ARTICULATORS are manufactured with extremely close tolerances of their moving parts and furthermore all instruments can be adjusted so all lateral play in centric relation is eliminated. (POSITIVE CENTRIC LOCK).
The individually adjustable

DENTATUS ARTICULATOR

TYPE ARH

The design of the DENTATUS Articulators has been made to fulfill the requirements necessary for efficient and accurate study of occlusal relations, diagnosis and treatment planning in natural and artificial dentitions. They are simple to use in routine dental practice.

The Articulators have been manufactured with such a sturdy and robust construction that they will stand up for years of constant use. The care with which polished or anodized surfaces, ground parts, etc. have been machined and finished is not only intended for the appearance but also to facilitate the removal of plaster, plastic and other foreign matter from the Articulator. The main purpose is to make it evident that this is a PRECISION INSTRUMENT and that it must be treated as such. Care, diligence and cleanliness should be used in its handling. This will help to secure the maintenance of proper accuracy of the Articulator.

The Articulators are designed to be adjustable for various methods and techniques used in both natural and artificial dentitions.

An outline of the construction, function and detailed procedures in its use will be found in the following chapters:

DENTATUS ARTICULATOR ARH, SPECIFICATIONS (PAGE 5)
DENTATUS FACE BOWS (PAGE 14)
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DENTATUS ARTICULATOR ARH, SPECIFICATIONS
THE CONDYULAR MECHANISM - THE USE OF THE ANTERIOR STOP SCREWS FOR THE CONDYULAR SPHERES AND BASIC POSITION OF ARTICULATOR

1. Set Screw for Horizontal Condylar Inclination (HCI)
2. Condylar Track
3. Lock Screw for Condylar Sphere
4. Condylar Sphere
5. Auditory Pin
6. Condylar Axis with Axis Pin
7. Centerpunched Calibrated Condylar Axis Pin
8. Condylar Track Assembly
9. HCI Calibration (see 1).
10. Larger Anterior Stop Screw for Condylar Sphere
10b. Lock Screw for Larger Anterior Stop Screw for Condylar Sphere.
11. Smaller Anterior Stop Screw for Condylar Sphere
12. Condylar Assembly Holder

The Condylar Spheres (4) should both be placed and locked in their BASIC POSITION during routine work with the Articulator.

It is practical after adjustment of Condylar Spheres in their Basic Position: (see also pages 18 and 23):

1) to lock the Set Screw for HCI (1) when the HCI Calibration (9) is adjusted and set at 40°

2) to lock the Condylar Assembly Holder (12) with a Bennett-Angle reading of 20° on its Calibration (33) by tightening its Lock Nut (15)

3) to lock Condylar Sphere (4) with its Lock Screw (3) turning it all the way clockwise.

Figure 2
Condylar Sphere in Basic Position in Condylar Track.

The Condylar Sphere (4) is in its BASIC POSITION when both the Larger Anterior Stop Screw (10) and the Smaller Stop Screw (11) for Condylar Sphere are turned as far as possible in a clockwise direction.
The Condylar Sphere (4) with its contained Condylar Axis (6) can be moved anteriorly and posteriorly from its Basic Position by adjusting the Anterior Stop Screws for Condylar Spheres (10 & 11). This adjustment enhances the reproduction of individual jaw movements. It is furthermore a valuable adjunct to studies in occlusion especially in advanced mouth rehabilitation.

NOTE: Condylar Spheres MUST always be FULLY UNLOCKED during any adjustments of their Anterior Stop Screws (Lock Screws for Condylar Spheres (3) should be turned all the way counter-clockwise).

ADJUSTMENT OF THE LARGER ANTERIOR STOP SCREW (10) FOR CONDYLAR SPHERE.

The Condylar Sphere (4) can slide anteriorly from its Basic Position when its Larger Anterior Stop Screw (10) is turned counter-clockwise (shown in Figure 3). The Amount of anterior movement can be read on the mm-Calibration (10-a). Its use is described under the heading of Adjustments for individual lateral movements etc. See page 39.

Note: Condylar Sphere (4) has been moved forward by turning its Larger Anterior Stop Screw (10) counter-clockwise. Amount visible on the millimetre Calibration (10 a) of Larger Anterior Stop Screw. This adjustment imitates a retractive movement of the Condyle. It is practical if a bilateral retraction should be desired to adjust the Bennett-Angles to zero degrees.

Figure 3
Condylar Sphere (4) moved Anteriorly in Condylar Track (2)
Adjustment of the smaller anterior stop screw for condylar sphere

The amount of posterior condylar movement can be read in millimeters on the Calibration (11-a) which becomes visible as the Smaller Anterior Stop Screw projects into the Condylar Track. The Condylar Sphere has contact with its Smaller Anterior Stop Screw's Endplate (11-b).

Important: As described above the Anterior Stop Screws can be adjusted so as to imitate any protrusive, lateral protrusive or pure lateral position of the mandible. This is a very important factor in the Articulator's construction which allows the study and/or correction of any such imitated and maintained tooth contact relation.

Thus entire series of lateral or protrusive tooth contact relations from 7–8 mm excursions and then step by step in decreased mm increments to the basic centric occlusal position can be individually studied and corrected. The Anterior Stop Screws can consequently also provide and determine a minute area (distance) of "Freedom from Centric", when this is desired in reconstructions.
DENTATUS ARTICULATOR ARH, SPECIFICATIONS

DIAGNOSTIC SPACE BETWEEN CONDYLAR SPHERE AND ANTERIOR STOP SCREWS' ENDPLATES

When casts of natural dentitions are correctly mounted on the Articulator in Centric Relation and subsequently placed together in maximum intercuspsation (Intercuspal Position I.P.) a Space (S) between the Condylar Spheres and their Anterior Stop Screws is frequently observed. It is a most IMPORTANT FEATURE in this type of Articulators that above mentioned area can be clearly observed. Therefore minor discrepancies of this nature are frequently concealed to the eye and the elimination of them becomes difficult and dubious. Due to the visibility and easy access to this area it becomes possible on both sides diagnostically to observe and with a feeler gauge to measure the Space (S) between the Condylar Spheres (4) and their Anterior Stop Screws’ Endplates (11b). In reconstructions and full dentures it becomes immediately visible if the Intercuspal Position I.P. coincides with Centric Relation C.R. because the simultaneous bilateral contacts between the Endplates (11 b) and the Condylar Spheres (4) can be observed clearly.

Note: Above mentioned feature with a clear view of this area is extremely important and it is also found in the New DENTATUS ARCON ARTICULATOR (type ARA).
ADJUSTMENTS TO TAKE UP LATERAL SIDE-PLAY IN THE UPPER JAW MEMBER (34).

TESTING OF LATERAL SIDE-PLAY

It is MANDATORY that no lateral side-play be present in the Upper Jaw Member. During testing for lateral side-play the following 4 points must be observed:
1. Horizontal Condylar Inclinations (HCI) set at 40° (9).
2. Bennett-Angles set at 20° (33).
3. Lock Screws for Condylar Spheres (3) must be completely loosened (turned all the way counter-clockwise).
4. Condylar Spheres (4) must be in their Basic Position with both Anterior Stop Screws (10 & 11) turned firmly all the way clockwise.

The Lower Jaw Member (16) is held firmly on the table with the left hand and the Upper Jaw Member (34) is moved with the right hand from side to side while in its most anterior position. This means pulling forwardly on the Upper Jaw Member, while making above described movement.

No lateral play, whatsoever, should be noticeable.

ARH CONDYLAR AXIS

![Image of ARH Condylar Axis]

Figure 6.
7. Calibrated Condylar Axis Pins
6. Condylar Axis
A1. Condylar Axis Shoulder
A2. Condylar Axis Perforation

A3. Condylar Axis Set Screws
A4. Condylar Shaft
A5. Condylar Axis Thread
34. Upper Jaw Member.

Figure 7.

ADJUSTMENT OF LATERAL SIDE-PLAY

1. The Articulator with its Long Support Rod (28) in place is opened and the small Set Screws (A3) in the Condylar Shaft (A4) are loosened with a small screw driver or in the newer Articulator types with an Allen wrench (see Figure 7).
2. The Calibrated Condylar Axis Pins (7) are removed.
3. A pointed instrument is inserted into the Condylar Axis Perforations (A2). This instrument is used as a wrench to turn the Condylar Axis (6).
4. The Condylar Axis (6) has a normal Thread (A5) which holds it into the Condylar Shaft (A4). Turn the Condylar Axis counter-clockwise until the side-play is taken up. Be sure to make equal amount of adjustment on either side.
5. Tighten the Condylar Axis Set Screws (A3).
6. Close Articulator and retest for the lateral side-play which by now should be eliminated.
7. IMPORTANT: Over-adjustment must be avoided. It is present if both Condylar Spheres are NOT simultaneously in contact with their respective Anterior Stop Screws. If any space between these parts is noticed the Articulator has been over-adjusted and must be readjusted.

8. Testing for Over-adjustment: Close the Articulator with a gentle anterior pull on the Incisal Pin. Release the pull and check visually the contact of the Condylar Spheres (4) against the Anterior Stop Screws (see Figure 2, page 6). Both Condylar Spheres MUST by this inspection simultaneously remain in contact with their respective Anterior Stop Screws.

9. The Articulator is now PROPERLY ADJUSTED and ready for use.

NOTE again: The Condylar Spheres must NEVER be locked with their Lock Screws during any of these procedures.

USE OF ADJUSTMENT WHEEL TO ELIMINATE LATERAL SIDE-PLAY AND/OR OVER-ADJUSTMENT OF UPPER JAW MEMBER IN THE TYPE ARH ARTICULATOR SHOWN BELOW. SEE PAGES 48–50

USE OF ADJUSTMENT WHEEL TO OBTAIN VARIOUSLY Sized IMMEDIATE SIDE-SHIFT (BENNETT-SHIFT). SEE PAGE 50

Figure 8
THE SOLID DETACHABLE INCISAL TABLE (23)
The Incisal Table (23) can be tilted anterior-posteriorly. The Lock Screw (21) is loosened and the Incisal Table can be adjusted to the desired inclination. The degree of inclination is indicated on the Calibration (22). The Table is detachable and can be interchanged with the fully adjustable Incisal Table shown in figure 10.

The detailed influence of the inclination of the incisal guidance upon the other factors of articulation will not be discussed here. It is, however, practical and advantageous in full denture construction both from a mechanical and functional point of view to set the Incisal Table flat or very slightly inclined.

If an individual acrylic anterior guidance is desired it can be suitably formed on the Solid Incisal Table (23). Its Groove (20) for Positioning of the Individual Anterior Guidance will secure a correct and accurate placement on the Incisal Table.

THE INTERCHANGEABLE SEGMENTED INCISAL TABLE

The Interchangeable Segmented Incisal Table is adjustable with Special Set Screws (I) and can be locked in the desired positions with its Lock Nuts (II) for lateral movements in the horizontal plane. It is delivered with a Special Incisal Pin with a broad tip (III), which allows for immediate rise in any lateral movements.

The Incisal Table can be tilted anterior-posteriorly in the horizontal plane and can be locked in the desired position by its Lock Screw (21). The setting of the Incisal Table can be noted on its Calibration (22).
DENTATUS ARTICULATOR ARH, SPECIFICATIONS

INCISAL PIN

The Curved, Calibrated Incisal Pin (25) is used with the Solid Detachable Incisal Table (23). The Pin is calibrated from +5 to −5 mm (27). The lightly loosened Curved Incisal Pin remains in the same position on the Incisal Table (23) during opening and closing of the Upper Jaw Member (34). This is a significant feature, among others, by the use of an Individual Anterior Guide Table (acrylic).

When the Incisal Pin (25) is set at 0 on its calibration (27) the Upper and Lower Jaw Member will be parallel to each other when the Articulator is closed. In this position the underside of the inserted Orbital Axis Plane Indicator (30) is at the same horizontal level as the Centerpunched Indentations in the Condylar Axis Pins (7).

When the Long Support Rod (28) is used, the opening of the Articulator standing on a table will make the Upper Jaw Member horizontal.

When Orbital Axis Plane Indicator (30) is in place the distance from the underside of it to the underside of the Upper Jaw Member measures 8 mm.

MOUNTING PLATE TYPE ARH-Z

The Mounting Plate ARH-Z (31) is cast of zinc and is of a simple design. On the under surface (A) of the Zinc Mounting Plate, the Positioning Hole (IV) and the Guide Slot (V) secure precise alignment against the Upper and Lower Jaw Members with their two Positioning Pins (17 and 19). This means that the Mounting Plate can be removed and accurately replaced on the Articulator. The Threaded Center Bushing (VI) is made of brass to prevent galling.

On the superior surface (B) the Threaded Center Bushing is covered (VII) as a protection against plaster entry during mounting procedures.

Figure 11
25. Curved Incisal Pin
27. Calibration of Incisal Pin
28. Long Support Rod
30. Orbital Axis Plane Indicator

Figure 12
Zinc Mounting Plate
DENTATUS FACE BOWS

Figure 13.
A. Calibrated Condylar Rod
B. Set Screw for Calibrated Condylar Rod
C. Orbital Pointer Pin
D. Locking Clamp for Orbital Pointer Pin
E. Bite Fork
F. Locking Clamp for Bite Fork
G. Anterior Jack Screw
H. Support Rod for Bite Fork
I. Calibrated Condylar Rods, AEB-NO with extendible pins

DENTATUS FACE BOW TYPE AEB

Accurate registrations obtained from the patient must be transferred to the Articulator with precision in order to fully utilize the scientifically designed DENTATUS Articulator. Only then is the precision Articulator used at greatest advantage. Calibrated Condylar Rods (AEB-NO) with extendible pins for a more exact positioning of the Face Bow on the patient are available on demand.

The DENTATUS Face Bow is designed for obtaining precise data from the patient and accurately feed this information into the Articulator. The Locking Clamps are made with tempered steel bushings. The pitch of their thread is such that it permits secure locking with minimum force. A light preliminary tightening with the fingers on the small part of their knurled heads suffices to obtain the registration. Before the Face Bow is removed from the patient the Locking Clamps must be firmly tightened using their larger knurled heads. This will not change the originally obtained exact position. All surfaces exposed to wear are anodized or reinforced with tempered steel. To accommodate extreme cases the DENTATUS Face Bow has been made somewhat larger than ordinary face bows.

The new Locking Clamps on the Face Bow have increased the locking quality considerably. This is important for handling and transportation.

An additional ordinary Locking Clamp with a special Lateral Support Rod (H) for the Bite Fork is available on demand.

NOTE: When using the Face Bow as a condylar Face Bow the calibrated Condylar Rods should be locked with B (Set Screw) at a calibration of 6,5 during mounting on the Articulator.
DENTATUS EAR-BOW
TYPE AEE

By the use of the Ear-Bow the procedures for mounting of upper cast are similar to the diagrams depicting the face bow registration (Page 16, Figures 15 and 16). The difference is that the Blue Ear Rods (l) are placed in the external auditory meatus of the patient during the Ear Bow Registration. Afterwards the Blue Ear Rods (l) are attached to the Auditory Pins (5) on the Condylar Track Assembly (8). For this procedure it is IMPORTANT that the HCl is set to 40° and the Bennett-Angles to 20° to ensure the prescribed 12 mm distance from the Auditory Pins to the Centerpunched Condylar Axis Pins (7). See page 22 C.2.

NOTE: When using Dentatus Face Bow as an Ear Bow the calibrated Blue Condylar Ear Rods should be locked with B (Set Screw) at a calibration of 7.2 during mounting on the Articulator.
MOUNTING OF CASTS IN ROUTINE PROCEDURES

TECHNIQUE FOR MOUNTING OF CASTS IN ROUTINE PROCEDURES STEPS I-III

The following technique (steps I, II, III) is formulated in order to show the use of the individually adjustable Articulator in simple routine work. Special procedures for more detailed adjustments are described in chapter "SPECIAL PROCEDURES" A, B, C and D — pages 35 - 47.

The DENTATUS Articulator with all its possibilities for adjustment and with its many calibrations, adapts itself perfectly to functional analysis and oral rehabilitation using even more advanced and sophisticated techniques than those described in the following Steps I-III.

The described technique for mounting of casts is primarily based upon the method of intraoral registrations with wax records. Reference is also given to certain details of the Articulator procedure when other techniques are used.

DIAGRAMS DEPICTING PATIENT PROCEDURES AND CORRESPONDING STEPS IN THE MOUNTING OF CASTS ON ARTICULATOR.

Figure 15
Face Bow registration

Figure 16
Mounting of upper cast from Face Bow registration
MOUNTING OF CASTS IN ROUTINE PROCEDURES

Figure 17
Registration of centric jaw relation

Figure 18
Mounting of lower cast from centric jaw relation record

Figure 19
Registration of protrusive jaw relation

Figure 20
Adjustment of Horizontal Condylar Track Inclination from protrusive jaw relation record
I MOUNTING OF UPPER CAST FROM FACE BOW REGISTRATION

A. PRELIMINARY BASIC SETTING OF THE ARTICULATOR.

1. The Condylar Axis (6) with its Condylar Spheres (4) should be in their Basic Position (see pages 6 and 7). First loosen Lock Screws (3) for Condylar Spheres. Both Anterior Stop Screws (10 and 11) must be solidly tightened (turned firmly all the way clockwise). This procedure should always precede the locking of the Condylar Spheres. Now the Condylar Spheres should be locked by tightening their Lock Screws (3) turning them solidly clockwise.

2. On general principles the Articulator controls are set and locked in their basic position. The Horizontal Condylar Inclination of the Condylar Tracks (2) are set at 40° and the Set Screws (1) for HCl tightened. The Bennett-Angles are set at 20° and their Lock Nuts (15) tightened.

3. The Orbital Axis Plane Indicator (30) is placed in the Articulator.

4. The Incisal Pin is locked with its Lock Screw (26) at a reading of zero on its Calibration (27). The Incisal Table (23) is set horizontally. Tighten its Lock Screw (21).

5. The Zinc Mounting Plate (31) is attached to the Upper Jaw Member (34) and solidly tightened by its Attachment Screw (32).

B. MOUNTING OF UPPER CAST USING DENTATUS STANDARD FACE BOW TYPE AEB

Figure 21

A. Calibrated Condylar Rod
B. Set Screw for Calibrated Condylar Rod

For detailed description of DENTATUS Face Bow see pages 14 and 15.
1. The Calibrated Condylar Rods (A) are adjusted and locked with their Set Screws (B) at the same reading of 6.5 cm on both sides. This will produce a slight spring effect when the Face Bow is placed over the ends of the Condylar Axis Pins (6). Thus the Face Bow will be held in place on the Articulator for the mounting of the upper cast.

2. The Incisal Pin is set and locked at zero on its Calibration and the Articulator is closed. The Face Bow is lowered or raised by means of the Anterior Jack Screw (G) until the Orbital Pointer Pin (C) touches the underside of the Orbital Axis Plane Indicator (30). (Figure 22).

When the Incisal Pin is set at zero on its calibration the Upper and Lower Jaw Member will be parallel to each other when the Articulator is closed. In this position the underside of the inserted Orbital Axis Plane Indicator is at the same horizontal level as the Centerpunched Indentations in the Condylar Axis Pins.

The above described adjustment will therefore always make the Upper Jaw Member parallel to the patient's orbital axis plane.

When the Orbital Axis Plane Indicator is inserted the distance from the underside of it to the underside of the Upper Jaw Member measures 8 mm.

3. It is practical to use the Spring-Loaded, Tilting, Telescopic Bite Fork Support with Long Release and Set Screw. The Bite Fork Support is attached to the Lower Jaw Member and the spring is released turning the Long Set Screw counter-clockwise. As the Tilting Support Bar (I) contacts the underside of the Bite Fork it is locked with its Set Screw (III Figure 23).

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![Figure 22]

**Figure 22**

- C: Orbital Pointer Pin
- G: Anterior Jack Screw
- 30: Orbital Axis Plane Indicator

![Figure 23]

**Figure 23**

1. Tilting Support Bar
2. Spring-Loaded Body
3. Long Release and Positioning Set Screw
4. The Articulator is opened and the upper cast, the upper full denture with its mounting cast or the upper bite rim with its base plate and cast is placed into the indentations in the wax or compound covering the Bite Fork. (Figure 24).

5. The Articulator is closed and it is observed how much space there is between the upper mounting plate and the cast. Always be sure that there is no contact between the cast and the mounting plate. (Figure 25).
6. A good quality of plaster like for instance Kerr’s Snow White Impression Plaster No. 2 should, because it has minimal setting expansion, be used for the mounting of the casts on the Articulator. The plaster is placed on the moistened cast which should have undercuts for mechanical retention. The Articulator is closed and the plaster projecting through the openings in the Mounting Plate should be smoothed off while still soft. As soon as the plaster has started its setting unlock the Condylar Spheres with their Lock Screws and remove the Mounting Plate carefully from the Articulator to facilitate trimming.

7. The upper cast has now been mounted on the Articulator from the Face Bow registration.
1. The insertion of the Calibrated Condylar Rods with the Special Blue Rounded Ear Pieces (I) permits the use of the Face Bow as an Ear Bow. The Blue Rounded Ear Pieces are then placed in the patient's right and left auditory meatus. In this way the Bow is held in place during the registration. The openings in the ear pieces permit their subsequent placing on the Auditory Pins (5) positioned on the Articulator's Condylar Track Assemblies. NOTE: The Calibrated Condylar Rods with their Ear Pieces are detachable and can thus easily be removed and sterilized.

2. It is important when using the Ear-Bow that the Condylar Track Assemblies' Auditory Pins are correctly positioned during mounting procedures on the Articulator. The Articulator ARH must therefore be adjusted and locked at the following settings: Horizontal Condylar Inclinations at 40° and Bennett-Angles at 20° to obtain the prescribed 12 mm distance from the center of the Condylar Axis. (See page 15 Figure 14).

3. The Calibrated Condylar Rods are adjusted and locked with their Set Screws (B) at the same reading of 7.2 cm on both sides. This will produce a slight spring effect when the Ear-Bow is placed over the Auditory Pins. Thus the Ear-Bow will be held in place on the Articulator for the mounting of the upper cast. (See Figures 28 and 29).

4. After steps Nos. 1—3 have been completed the mounting procedures for the upper cast are identical to the just described step by step procedures for mounting from the Standard Face Bow. Therefore these steps namely No. 2 (page 19) to and included step No. 7 (page 21) should be executed.
MOUNTING OF THE LOWER CAST FROM A CENTRIC JAW RELATION RECORD

A. BASIC SETTING OF THE ARTICULATOR

An absolute precise BASIC SETTING of the Articulator is MANDATORY for the exact and accurate mounting of the lower cast in centric relation.

1. Be sure the Condylar Axis (6) with its Condylar Spheres (4) are in their Basic Position (see pages 6 and 7). First loosen Lock Screws (3) for Condylar Spheres. Both Anterior Stop Screws (10 and 11) must be thoroughly tightened (turned firmly all the way clockwise). This procedure should always precede the locking of the Condylar Spheres.

2. Now lock the Condylar Spheres in their centric position by tightening their Lock Screws (3) Turn them solidly all the way clockwise.

NOTE: It is IMPERATIVE that both above mentioned procedures are executed in the prescribed manner and order because otherwise the Condylar Spheres could be locked in excursive positions.

3. On general principles the Articulator controls are set and locked in their basic position. The Horizontal Condylar Inclination (HCI) of the Condylar Tracks (2) are set at 40° and the Set Screws (1) for the HCI tightened. The Bennett Angles are set at 20° and their Lock Nuts (15) tightened.

However, step No. 3 does not apply when AXIOGRAPHY or similar other techniques are utilized. In these techniques a determination of the HCI and Bennett-Angles have already been made prior to the mounting of the lower cast. In such cases the setting of the Articulator controls for HCI and Bennett-Angles should consequently be set to the previous findings of their degrees.

4. NOTE: The Orbital Axis Plane Indicator (30) should not be placed in the Articulator when mounting the lower casts.

5. In cases where the correct occlusal vertical dimension has been incorporated the Incisal Pin is set to 0° on its Calibration (27). It is, however, practical when an interocclusal centric jaw relation record is used to set this calibra-
tion to a reading of five millimeters opening because a subsequent closure of the Articulator into occlusion is required. Reason: After the mounting the wax record is removed and the Articulator is closed to the first tooth contact. A reading on the Incisal Pin Calibration will indicate the thickness of the recording material.

6. The Zinc Mounting Plate is attached to the Lower Jaw Member (16) and solidly tightened with its Attachment Screw (18).

7. A piece of waxed paper with a special cut out to accommodate the Mounting Plate is placed around the firmly attached Lower Mounting Plate for protection of the Lower Jaw Member against plaster contact. NEVER place the paper between the Mounting Plate and the Lower Jaw Member. (Figures 30 and 31, page 24).

8. A tongue blade may be placed in front of the Condylar Posts (13) bending the waxed paper upwards. This will help carrying the plaster up behind the lower cast while mounting it.

9. The Long Support Rod (28) may be replaced with a short Support Rod, which will permit an increase in the opening of the Articulator’s Upper Jaw Member from 180 to 225 degrees. (Figure 30, page 24).

B. MOUNTING OF THE LOWER CAST

1. Natural Dentitions

Be positive that the centric jaw relation record fits both upper and lower casts accurately. Cut away any part of the record which touches any area of soft tissue. The record should touch only tooth substance. Note that the record should show only light cusp indentations because the cusp tips are most accurately reproduced on the casts.

Artificial Dentures.

Check that bite rims or finished full dentures fit precisely in the centric jaw relation records.

2. To help execute proper finger pressures for mounting the lower cast, place the record on the lower cast and make pencil marks on the side of the cast corresponding to most anterior and most posterior imprints in the record.
Now extend the lines from the sides of the lower cast to its base and make lines to the distal forming a triangle as shown in Figure 30.

This forms the best place for the special finger grip which affords the ideal method of holding the two casts together while mounting the lower cast. See Figure 31.

3. Make a trial closure of the Articulator with the special finger grip. There should be full clearance for the fingers between the lower cast and the Mounting Plate. Note that the thumbs are gripping on the upper Mounting Plate centered between the index and third fingers which are holding the lower cast (see Figure 32).
4. After the trial closure the Articulator is opened and Kerr Snow-White Impression Plaster No. 2 is mixed with 100 cc of water to assure a sufficient quantity for the mounting.

5. The operator should stand behind the Articulator and hold the casts together with the previously described grip and close the Articulator bringing the lower cast into the soft plaster placed on the Lower Jaw Member. The tongue blade which was used to pack the plaster behind the lower cast MUST always be removed at this time otherwise it might set up a tension. The finger grip is maintained while the plaster sets (see Figure 32).
MOUNTING OF CASTS IN ROUTINE PROCEDURES

III ADJUSTMENT OF THE INCLINATION OF THE CONDYLAR TRACK FROM PROTRUSIVE JAW RELATION RECORD

A. SETTING OF THE HORIZONTAL INCLINATION OF THE CONDYLAR TRACK

(Inclination in relation to the horizontal plane)

1. The Bennett-Angles are set to $20^\circ$ on their Calibrations (33). The Condylar Spheres (4) should be unlocked by loosening their Lock Screws (3). The Incisal Pin should be lifted before the setting is done.

2. The protrusive jaw relation record is checked for accurate fit as described under the heading: B. Mounting of the lower cast (page 23, B.1.) It is important that the protrusive record is extended to cover the most posterior part of the dentition or bite rim. The protrusive jaw relation wax record is placed between the teeth or the bite rims, thus moving the Condylar Axis posteriorly, corresponding to the recorded amount of protrusion. The distance between the Condylar Spheres and their Anterior Stop Screws indicates the amount of protrusion, the optimum being 5 millimeters.

3. The Articulator is held firmly, for instance, against the chest, and pressure is applied on the Upper Jaw Member above the center (IMPORTANT) of the area, where the recording material is located between the casts. The Set Screws for the Horizontal Condylar Inclinations (1) are loosened and lightly moved back and forth; do not use any force. Thus the Horizontal Condylar Inclinations are adjusted until it is observed that the upper and lower casts are in accurate and uniform contact with the record. (Figure 33). If the Set Screws (1) are

Figure 33
MOUNTING OF CASTS IN ROUTINE PROCEDURES

moved too far to either side an opening anteriorly or posteriorly will be noticed between the teeth or the bite rims and the record. The right and the left Horizontal Inclination of the Condylar Track (2) are adjusted separately and the respective Set Screw is tightened after each adjustment. The procedure is repeated as a check. The readings on the Calibrations for Horizontal Condylar Inclinations (9) are written on the plaster mounting and on the patient’s record chart.

B. LATERAL SETTING OF CONDYLAR TRACKS BY ADJUSTMENT OF CONDYLAR ASSEMBLY HOLDERS. (Inclination to the sagittal plane or Bennett-Angle).

In ordinary routine procedures the Calibration on the Condylar Posts (33) for lateral inclination of Condylar Tracks (Bennett-Angles) are set arbitrarily to 20°. This adjustment is made by turning both the right and left Condylar Assembly Holders (12) to this Calibration. The Condylar Assembly Holders are locked in this position by tightening the Lock Nuts (15) for Bennett-Angle Setting.

For special setting from Lateral Jaw relation records, see page 39.
DENTATUS ARTICULATOR ARL
1. Set Screw for Horizontal Condylar Inclination (HCI)
2. Condylar Track
3. Lock Screw for Condylar Sphere
4. Condylar Sphere
5. Auditory Pin
6. Condylar Axis with Axis Pin
7. Centerpunched Calibrated Condylar Axis Pin
8. Condylar Track Assembly
9. H C I Calibration (see 1.)
10. Larger Anterior Stop Screw for Condylar Sphere
11. Smaller Anterior Stop Screw for Condylar Sphere
12. Condylar Assembly Holder
13. Condylar Post
14. Threaded Holes for Special Leveling Screws
15. Lock Nut for Bennett Angle Setting
16. Lower Jaw Member
17. Posterior Positioning Pin for Mounting Plate
18. Attachment Screw for Lower Mounting Plate
19. Anterior Positioning Pin for Mounting Plate
20. Incisal Table Groove for Positioning of Individual Incisal Guide
21. Lock Screw for Incisal Table
22. Note: Calibration for Incisal Table Setting is not shown as it is engraved on opposite side
23. Solid Detachable Incisal Table
24. Incisal Groove
25. Calibrated Curved Incisal Pin
26. Lock Screw for Incisal Pin
27. Incisal Pin Calibration
28. Support Rod for Upper Jaw Member
29. Lock Nut for Orbital Axis Plane Indicator
30. Orbital Axis Plane Indicator
31. Gauge Block
32. Attachment Screw for Upper Mounting Plate
33. Bennett-Angle Calibration
34. Upper Jaw Member
35. Universal Joint Lock Screw
36. Allen Wrench for Universal Joint Lock Screw
This Articulator has another unique feature which is not found in any other Articulator. ARL is identical with the Dentatus ARH Articulator, however, with the exception that the ARL Articulator has an adjustable Upper Jaw Member. The ARL Articulator can thus be adjusted to relatively accurate mutual conformity of the Upper and Lower Jaw Members by means of the Gauge Block. This means that casts mounted on one Articulator can be transferred to another Articulator and the original mounting is thus closely approximated. (The identity, however, is not absolute and this procedure should only be used during the construction of artificial dentures. The mounting of the finished dentures and the final occlusal adjustment should be made on the same Articulator).

The Gauge Block is also a protective measure and should be in place when the Articulator is transported between the dental office and the dental laboratory. The mounted casts should be detached and wrapped separately. This will prevent the Articulator and casts from being damaged by rough handling during the transit.

An Articulator will in practical work be subject to gradual changes either by wear or accident. When such changes occur, checking and adjustment of the Articulator's accuracy are necessary. The Gauge Block is an efficient adjunct to the Articulator for the solution of this problem.
INSTRUCTIONS FOR USE OF DENTATUS ARTICULATOR ARL WITH GAUGE BLOCK

MOST INSTRUCTIONS FOR THE USE OF THE ARH ARTICULATOR IN THIS BOOK ALSO APPLY FOR THE ARL ARTICULATOR.

ADJUSTMENTS BY MEANS OF GAUGE BLOCK.
Adjustments for lateral play etc. as described on Pages 10 and 11 for the ARH Articulator MUST PRECEDE subsequent adjustments by means of Gauge Block.

Adjustments:

1. Set and lock calibrations for HCl (9) at 40° and Bennett-Angle Calibrations (33) at 20°. — Lock Condylar Spheres (4) with their Lock Screws (3) in Articulator’s Basic Position. — See Page 6. Raise the Incisal Pin (25).

2. Clean meticulously the bushings on the Upper and Lower Jaw Members, against which the Gauge Block will be placed.

3. Attach the Gauge Block (31) to the Upper Jaw Member (34) only.

4. Hold Articulator’s Upper Jaw Member by grasping firmly around attached Gauge Block. Insert Wrench (36) in Universal Joint Lock Screw (35) and loosen it, turning the Wrench counter-clockwise.

5. Loosen the Gauge Block from the Upper Jaw Member. Attach it solidly to the Lower Jaw Member (16) observing that the threaded brass spring core is upwards.

6. Seat the Upper Jaw Member against threaded brass spring core in the Gauge Block and attach solidly.

7. Check if lock washer is present between the Universal Joint Connection and the Upper Jaw Member.

8. Check that the space between the two Upper Jaw Member Parts (34) is the same all around.

9. Hold these two parts in the above prescribed position and tighten Universal Joint Lock Screw (35) lightly with Wrench (36).

10. Loosen Condylar Lock Screws (3). Check that the Condylar Spheres are still in their basic position. Otherwise repeat adjustment.

11. Relock Condylar Lock Screws (3) and tighten Universal Lock Screw SOLIDLY. IMPORTANT: THIS TIGHTENING MUST BE MADE EXTREMELY FORCEFULL.

12. The Articulator is now properly adjusted and ready for use.
MOUNTING OF CASTS,
SPECIAL PROCEDURES

A. SPLIT CAST TECHNIQUE (PAGES 36 - 38)
B. LATERAL JAW RELATION RECORDS (PAGE 39)
C. USE OF HINGE AXIS LOCATOR AND HINGE AXIS TRANSFER BOW (PAGES 40 - 47)
D. AXIOGRAPHY (PAGE 47)
A. SPLIT CAST TECHNIQUE

The ABSOLUTE CORRECT MOUNTING of the lower cast in centric relation is one of the MOST IMPORTANT FACTORS in Functional Articulator Analysis in both natural and artificial dentitions. It ought therefore to be MANDATORY always to check this exacting step for precision, accuracy and correctness. *

STEP BY STEP PROCEDURES TO BE FOLLOWED WHEN CHECKING THE CORRECT MOUNTING OF LOWER CASTS ON ARTICULATORS USING SPLIT CASTS

In order to make the test as efficient as possible the following steps should be followed RELIGIOUSLY.

1. Unlock Lock Screw (3) for Condylar Spheres. Raise Incisal Pin and close Articulator. Set and lock Incisal Table at maximum steepness of 40°. Turn Articulator with its right side towards you.

2. In the natural dentition leave the Primary Base Cast (or in the artificial dentition the denture and its Primary Base Cast) seated in the jaw relation record. Open the Articulator.

3. Place left index finger in center of Primary Base Cast and exert a firm uniform pressure.

4. While maintaining this pressure grasp the outer sides of the Primary Base Cast with the right index finger and thumb and hold the Cast securely in a steady position against the jaw relation record (Figure 35).

5. While maintaining the grip with the right hand the left index finger is removed from its position in step No. 3.

6. The Articulator can now be closed (see Figure 36), and the Secondary Base Cast brought in contact with the Primary Base Cast. During this Checking the holding grip on the Primary Base Cast with the right hand must NEVER be released.

7. Examine the fit of the Split Casts carefully. — When checking for correct mounting in Terminal Hinge Relation (Centric Relation) the Upper Jaw Member must be pulled vigorously forward (see Figure 37). It should be noted that the Condylar Spheres on both sides are simultaneously in contact with their Anterior Stop Screws as the Split Casts go together with absolute precision.
8. Use Dental Loupes while studying the fit of the Split Casts at all visible areas most carefully.

9. Note it is MANDATORY to maintain finger grip with the right hand until step No. 8 has been terminated. Now release grip and leave Articulator closed.

10. Turn Articulator with its left side towards you. Open Articulator.

11. Repeat step No. 3 but this time use your right index finger.

12. Repeat step No. 4 but this time use your left index finger and thumb.

13. Steps No. 5 to 9 are repeated but with the fingers as described in steps No. 11 and 12.

14. This checking system should be used not only to check the correct mounting of casts in THR (Terminal Hinge Relation) but also to check each setting of the Articulator controls from excursive jaw relation records. Thus the Articulator acceptance of all excursive jaw relation records also OUGHT to be verified.

The first Split Cast acceptance and checking will only verify that the lower cast has been mounted with precision from the record which was used. IT IMPLIES IN NO WAY THAT THE RECORD WAS PROPERLY TAKEN.
B. LATERAL JAW RELATION RECORDS

ADJUSTMENTS FOR INDIVIDUAL LATERAL MOVEMENTS (BENNETT-SHIFT) FROM LATERAL JAW RELATION RECORDS.

The registration of right and left lateral jaw relations can be made individually with different types of lateral interocclusal jaw relation records.

Adjustment of both sagittal and horizontal inclinations of the Condylar Track on the left side (balancing side) are made from the right lateral jaw relation record. The similar adjustment on the right side is made from the left lateral jaw relation record. The Lock Nut (15) for the Bennett-Angle Setting on the balancing side is loosened and the Condylar Assembly Holder (12) is turned all the way laterally to the highest possible Bennett-Angle Calibration (33). The lateral record is now placed between the teeth and the Articulator is closed. On the balancing side a space will generally be noticed between the shoulder (A I, see Figure 6 page 10) on the Condylar Axis and the Condylar Sphere (4). The Condylar Assembly Holder (12) is now gently turned towards lower Calibrations (33) until the above mentioned space is closed. The Lock Nut (15) is tightened in this position. After this procedure the Horizontal Condylar Track Inclination (2) is adjusted as described under the heading: Setting of the inclination from protrusive jaw relation record; (III A 3, page 26). If any changes from previously found values occur in the Horizontal Condylar Track Inclination the adjustment with the protrusive records should be rechecked.

It is found in a few cases that the Condylar Sphere (4) on the working side will move anteriorly to its basic position while the Condylar Sphere (4) on the balancing side is moving posteriorly. This type of movement can be reproduced on the Articulator by loosening the Larger Anterior Stop Screw (10). See page 7, Figure 3. The Condylar Sphere will thus move anteriorly seemingly corresponding to a posterior movement of the patient’s condyle. The amount of movement is determined in millimeters by reading the Calibration (10 a) on the larger Anterior Stop Screw (10). This type of individual lateral movement can thus be reproduced on the Articulator. The settings of all calibrations are written on the plaster mounting and on the patient’s record chart.
C. USE OF HINGE AXIS LOCATOR AND HINGE AXIS TRANSFER BOW

The versatility of the DENTATUS ARTICULATORS permits its full use in various techniques employing the hinge axis concept. The majority of hinge axis transfer bows can easily be used with these instruments. The following step by step procedures will describe the use of the DENTATUS ARTICULATOR using the hinge axis equipment designed by Arne G. Lauritzen and manufactured by the Almore International, Inc.

HINGE AXIS LOCATION: Step by step procedures.

a) Edentulous cases: Use the Mandibular Clamp (see Figure 38). It secures the lower denture or bite rim SOLIDLY to the mandible and also leaves the chin free for manipulation.

1. The underside of the Bite Fork is attached directly to the occlusal surface of the lower denture or bite rim with stick compound. The upper side of the Bite Fork has two upright Positioning Pins which fit into the holes located in the Cross Member of Mandibular Clamp.

2. In attaching Bite Fork to lower denture the stick compound is first placed on the underside of the Bite Fork (never directly on the teeth) and pressed firmly onto the teeth. Then a little stick compound may be added for better attachment of Bite Fork to the teeth (during denture construction the Bite Fork would be attached to the bite rim which is made of compound). Lower denture with attached Bite Fork is placed in the mouth. Remember: Upper denture should never be in mouth during hinge axis location.

3. The Mandibular Clamp is then positioned by placing its perforated Cross Member over the two Positioning Pins on the upper side of the Bite Fork.

4. The outer Lock Nuts for vertical adjustment of Pressure Pads are now loosened, allowing the Stainless Steel Springs to push the Pressure Pads up against the mandible.
5. Loosen Lock Nut under Pressure Pad. Adjust the latter to the individual width of the mandible and to the angulation of its lower border. When the Pressure Pad is in the desired position tighten the Lock Nut under it solidly. Repeat the procedure on opposite side (Figure 39).

6. Place index and third finger on the top of Cross Member's right side and the thumb on the Lock Nut of the Pressure Pad, pushing it forcefully against the lower border of mandible. Lock it in this position by tightening the outer Lock Nut SOLIDLY. Repeat procedure on opposite side. (If patient complains of pain, place Xylocaine Ointment on cotton under lower denture and wait five minutes before clamping forcefully).

7. Hinge Axis Locator can now be attached to stem of Bite Fork.

b) Dentulous cases: Use the Rimlock Clutch Tray.

Attach Rimlock Clutch Tray to lower teeth by means of an alginate impression material which sets up VERY HARD. (D.P. Impression Cream). Additional retention can be gained by inserting Stimudents or wooden wedges between lower anterior teeth and cutting them off 2–3 mm from teeth with crown scissors.

IMPORTANT

In placing Clutch Tray, guide patient's mandible into centric jaw relation and have patient bite Tray to place and continue to bite lightly on it until alginate has set. Remove surplus alginate covering teeth posterior to Tray with a cement spatula.

Hinge Axis Locator can now be attached to stem of Clutch Tray.
c) Hinge Axis Location

Note: The following steps for the hinge axis location and transfer bow registration are identical in the edentulous and the dentulous cases.

Figure 40
Hinge Axis Locator with Rimlock Clutch Tray attached

1. Attach Side Arm to end of Anterior Cross Bar. Place Anterior Cross Bar HORIZONTALLY (always closer to the face) by positioning its Locking Clamp with the Handle upwards, on the Stem of the Clutch Tray (see Figure 40) or in the edentulous case to the Stem of the Bite Fork.

2. Position complete Locator Unit so the Steel Needle approximates arbitrarily marked condyle point on right side. Lock SOLIDLY in this position to Stem of Bite Fork.

3. Guide patient to perform opening and closing movements in terminal hinge relation with thumb and index finger on lower border of patient’s chin (Gnathion). Millimeter graph paper should be attached to patient’s skin in hinge area.

4. Note movement at Point of Steel Needle. Needle should never touch graph paper.

5. If an arc is scribed by the Point of the Steel Needle, adjust Needle towards center of arc by means of Hinge Axis Locator Adjustment Screws.

6. Adjustments are continued until ABSOLUTELY NO MOVEMENT is discernible at the Needle Point. MUST be observed under MAGNIFICATION.

7. Have patient sit erect with head out of head rest. BE SURE PATIENT IS NOT IN PROTRUSIVE, and mark hinge axis point on skin.

8. Remove Side Arm. Turn Steel Needle end for end in Sleeve. Attach Side Arm to other side of Anterior Cross Bar and REPEAT procedures Nos. 2–7, this time on the left side of the patient.
THE HINGE AXIS TRANSFER BOW REGISTRATION: STEP 1 TO 6

1. Cover the prongs of the Bite Fork either with compound or preferably with the EXTRA HARD BLUE "DELAB BITE REGISTRATION WAX" warmed at 60°C or 140°F. Insert between teeth or dentures. IMPORTANT: Stem of Bite Fork should project a little laterally towards the patient's right side, NEVER medially. (This will make the Stem clear the Incisal Table of the Articulator). Have patient touch the material covering the Bite Fork prongs very gently. CHILL, REMOVE from mouth. After thorough chilling check upper cast or denture for precise fit into the imprints. Reinsert in mouth and let patient hold Bite Fork by biting into the imprints.

2. IMPORTANT. Use Locking Clamp to patient's right for the Stem of the Bite Fork. The Locking Clamp in the middle is left free and the Clamp to the patient's left is used for the Orbital Pointer Pin.

3. Place Locking Clamp to Patient's right with its Handle upwards on Stem of Bite Fork while holding Transfer Bow with its Side Arms pointing straight down. Raise complete Transfer Bow carefully from this position until the Condylar Needles approximate position of the hinge axis points. Tighten Locking Clamp SOLIDLY.

4. Set Orbital Pointer Pin at Orbitale or corresponding nose point and tighten Locking Clamp solidly. Always do this step at this time.

5. Have patient sit erect - no head rest. Adjust Points of Condylar Needles to coincide with tattooed hinge axis points, barely avoiding contact with the skin, and lock Set Screws at ends of Side Arms.

6. In order to preserve the measurement of facial width, Collett Stops are used. Loosen its knurled metal Nut, which always should be placed towards the Needle Sleeve. The color coded plastic Screws should be placed towards the outside with their markings RH and LH pointing outwardly. The entire Collett Stop is moved toward the Needle Sleeve. The knurled metal Nut is held against the Needle Sleeve and the plastic knurled Collett Screw is screwed into the metal Nut thereby locking the Collet Stop to the Condylar Needle. After the Adjustment Screws of the Side Arms are locked with their Lock Nuts check that Condylar Needle Points coincide with hinge axis points. If desired the Condylar Needles can now be removed and later placed back into the Needle Sleeves in precisely the same position. Be sure not accidentally to reverse right and left side. Remove Condylar Needles; have patient open the mouth and remove Transfer Bow from patient.

MOUNTING OF UPPER CAST FROM HINGE AXIS TRANSFER BOW REGISTRATION: STEP 7 TO 14.

7. Attach Transfer Bow by means of central Locking Clamp to Mounting Column on Mounting Table. Place it vertically. Tighten Locking Clamp.

8. Prepare Articulator. Attach Upper Mounting Plate, Orbital Axis Plane Indicator and the long Support Rod. Attach the adjustable Articulator Leveler to the Lower Jaw Member and set the Calibrated Condylar Axis Pins equidistantly so as to match the facial width. Remember that the minimum width of the Articulator's Condylar Axis is 132 mm. IMPORTANT: The Condylar Needles must NEVER be moved in or out to accommodate the Condylar Axis of the Articulator.
9. Place opened Articulator on Mounting Table. Loosen Locking Clamp on Mounting Column and move Transfer Bow down into position. Try to get Orbital Pointer Pin and Condylar Needle on left side at same horizontal level.


Preferably the orbital axis plane should slant slightly downward in front. Try also to match Condylar Needle Points with Centerpunched Indentations of Calibrated Condylar Axis Pins. Tighten Locking Clamp on Mounting Column SOLIDLY.

Check this CAREFULLY, sighting it in vertically and horizontally. Needle points should not contact Centerpunched holes (See Figure 41).
11. Place two small knobs or Kerr Snow White Impression Plaster No. 2 on Adjustable Parallel before inserting it carefully under Bite Fork for support. When plaster has set, place upper cast of natural teeth or upper cast with its denture in imprints of Bite Fork. (Test for correct seating in wax by firm downward pressure placing three fingers in center part of cast).

Figure 42.
12. Close the Articulator for the first time and lock Incisal Pin when Orbital Pointer Pin contacts underside of Orbital Axis Plane Indicator. (See Figure 42).


14. After initial set loosen Lock Screws for Condylar Spheres (3) and remove upper Mounting Plate with cast to trim plaster while still soft. Clean off the plaster from Upper Jaw Member and remove Articulator Leveller. Replace Upper Mounting Plate on Articulator.

Now to review — what we have done? We do not really know what we have done. We know what we attempted to do. The paramount principle in the steps we have followed was to mount the upper cast in such a way that the opening and closing axis of the Articulator should coincide with the patient’s transverse hinge axis. Just because we have followed a series of steps, however, does not guarantee us that somebody did not step on the Transfer Bow, dropped it on the floor, that all tightening screws were solidly locked, that the cast was properly seated in the imprints, etc., etc. The act of performing the steps alone does not prove that what we have done was done with precision. Discipline demands that we check ourselves for accuracy.
SPECIAL PROCEDURES, HINGE AXIS TECHNIQUE

CHECKING FOR ACCURATE MOUNTING OF UPPER CAST FROM HINGE AXIS TRANSFER BOW REGISTRATION.

There are two parts for this check, first the Articulator Check and secondly the Patient Check.

1. Remove the Transfer Bow from the Mounting Column. Place the Bite Fork with a heavy pressure against the upper cast or upper denture with the Articulator opened. The Orbital Pointer Pin should contact the replaced Orbital Axis Plane Indicator. If the Orbital Axis Plane Indicator cannot be inserted the distance from the underside of the Upper Jaw Member to the Orbital Pointer Pin should amount to measured 8 mm. The Condylar Needle Points should coincide with the center-punched holes in the Calibrated Condylar Axis Pins on the right and on the left sides. If this checks out precisely the first step of the checking has been satisfactory. How much of an error can be tolerated here? It is clear that the more precise this is the better, however, if the Needle Points should be outside the flat endplate of the Condylar Axis Pins a new mounting would be deemed necessary.

2. As step No. 1 has been executed the Condylar Needles are removed from their Sleeves. The Transfer Bow is carefully placed on the patient and the patient asked to hold the Transfer Bow in place by biting on the Bite Fork. The position of the Orbital Pointer Pin is checked and the patient’s head should now be held in the previously mentioned orthostatic position. The Condylar Needles are now inserted and locked into their respective Sleeves. They should barely touch the skin when the Collet Stops contact the Sleeves and of course the Needle Points should correspond to the marked right and left hinge axis points on the patient’s skin. If these two tests check out perfectly you can be positive that the Articulator opening and closing axis corresponds to what you have located as being the transverse hinge axis of the patient.

D. AXIOGRAPHY

HORIZONTAL CONDYLAR INCLINATIONS

Location of transverse hinge axis on maxillary attached “flag bow”. Drawing the movements of the axis on flags (axiography) for determining character and Horizontal Condylar Inclinations (HCIs’) of Condyle Paths.

ADJUSTMENTS OF BENNETT-ANGLES

Use of the special Gauge Meter for measuring the Bennett movements in hundreds of mm at different stations of lateral jaw movements. According to this information computerized tables are used for determining the individual correct setting of the Articulator’s Bennett-Angles.
TESTING AND ADJUSTMENTS TO ELIMINATE LATERAL SIDE-PLAY AND/OR OVER-ADJUSTMENT OF UPPER JAW MEMBER IN THE TYPE ARH ARTICULATORS WHICH ARE EQUIPPED WITH THE ADJUSTMENT WHEEL SHOWN AS B1 IN FIGURE 45. SEE PAGES 48–50.

USE OF ADJUSTMENT WHEEL TO OBTAIN VARIOUSLY SIZED IMMEDIATE SIDE-SHIFT (BENNETH-SHIFT). SEE PAGE 50.

It is MANDATORY that absolutely no Lateral Side-Play and/or Over-Adjustment of the Upper Jaw Member is present in the Terminal Hinge or Centric Position.

TESTING
A. Set and lock HClS (Horizontal Condylar Inclinations) at 40° on their Calibrations (9).
B. Set and lock Bennett-Angles at 20° on their Calibrations (33).
C. Loosen Lock Screws (3) for Condylar Spheres completely.
D. Turn both Anterior Stop Screws (10 & 11) all the way clockwise to place both Condylar Spheres in their Basic Position.
E. Pull Upper Jaw Member forwardly and try to move posterior part of it from side to side. No side-play should be noticeable.
F. The Articulator should also be checked visually at the Condylar Spheres (4) which both should be in simultaneous contact with the Endplates (11b) of their Anterior Stop Screws (10 & 11). If not the Articulator is over-adjusted.
MECHANICS IN USE OF THE CALIBRATED ADJUSTMENT WHEEL

Lateral side-play is present when the Condylar Axis Shoulders (A¹) are NOT in intimate contact with the inside of Condylar Spheres (4) in the terminal hinge position.

WARNING: It is MANDATORY, whenever the Adjustment Wheel (B¹) is being used, that both Condylar Axis Set Screws (A³) are loosened and the adjustments following the points A to D above under "Testing" have been executed.

When Articulator is standing with its back towards you, turning the upper part of the Adjustment Wheel (B¹) forwardly away from you or towards smaller No.s on its Calibration (B³) the Condylar Axis Shoulders (A¹) will move away from each other and thereby INCREASE the distance between them.

Turning the upper part of the Adjustment Wheel (B¹) posteriorly towards you or towards larger No.s on its Calibration (B³) will DECREASE the distance between the Condylar Axis Shoulders (A¹).

ADJUSTMENT OF LATERAL SIDE-PLAY

1. Turn the closed Articulator with its back towards you. Loosen the two Set Screws (A³) for Condylar Axis (9). Be sure the Adjustment Wheel Set Screw (B³) is tightened.
2. Turn upper part of Adjustment Wheel (B¹) forwardly away from you or towards smaller No.s on its Calibration (B³) (except from zero, where you would go from zero to 6-5-4 etc.) until the side-play has been eliminated. — Watch that Condylar Spheres are in simultaneous contact with their Anterior Stop Screws.
3. Tighten the two Set Screws (A³) for Condylar Axis.
4. Loosen Adjustment Wheel Set Screw (B³).

NOTE: If this Set Screw (B³) by the adjustment in step No. 2 should have been turned to an unaccessible position the two Condylar Axis Set Screws (A³) are loosened. The Adjustment Wheel is turned until its Set Screw (B³) is at the closest posterior, inferior accessible position. Retighten both Condylar Axis Set Screws (A³) and loosen the Adjustment Wheel Set Screw (B³). — Turn the Wheel 180 degrees and retighten its Set Screw (B³).
Recheck for side-play and/or over-adjustment and continue accordingly from step No. 1, 4, 5 or 8.
5. Turn the Wheel (B') until the zero mark of its Calibration (B^3) is at the Indicator Line (B^4) on the right side of Upper Jaw Member (34).
6. Tighten Adjustment Wheel Set Screw (B^2) and retest for side-play.
7. Check visually for over-adjustment. See paragraph F under the heading TESTING (page 48).
8. **If over-adjusted** loosen both Condylar Axis Set Screws (A^3).
9. Turn upper part of Adjustment Wheel (B') posteriorly towards you, which means towards larger No.s on the Calibration (B^3).
10. When over-adjustment has been corrected repeat steps No.s 3-4-5 and 6.
11. It might be important especially when the Segmented Incisal Table is used to accurately center the Upper Jaw Member and the Incisal Pin on the Incisal Table.
12. The Set Screws (A^3) for the Condylar Axis and (B^2) for the Calibrated Adjustment Wheel are all loosened.
13. The Upper Jaw Member can now be moved from side to side and thus centered.
14. The Three Set Screws which were loosened in step No. 12 are retightened and the Articulator is now ready for use.
15. The Articulator is left like this if no Immediate Bennett Movements are desired. The Articulator now has a POSITIVE CENTRIC LOCK.

**WARNING:** It is MANDATORY, whenever the Adjustment Wheel (B') is being used, that both Condylar Axis Set Screws (A^3) are loosened and the adjustments according to points B and C above under "Testing" (page 48) have been executed. The Set Screw (B^2) of the Calibrated Adjustment Wheel should **ONLY** be loosened when eliminating side-play as described in steps No.s 4, 5, 12 and 13.

**IMMEDIATE BENNETT SHIFT**
The following is important, provided this feature of the Articulator is going to be used.

1. The Calibrated Adjustment Wheel (B') should **ONLY** be turned after both Condylar Axis Set Screws (A^3) are loosened.
2. **NEVER** turn the top part of the WHEEL anteriorly except when going back to the CENTRIC POSITION at 0 on the Calibration.

The amount of Immediate Bennett Shift is adjustable by turning the top of the Adjustment Wheel posteriorly and thus towards larger Calibrations. Each No. on the Calibration Scale produces a Side-Shift of 1/10 of a mm. In this way you would for instance at 6 on the Calibration have 6/10 of a mm Side-Shift. After one total turn of the Wheel the zero mark would correspond to 7 and hence the Side-Shift would be 7/10 of a mm and so on.

**NOTE:** The distance between each Calibration line is 8 mm. Thus it is even possible to evaluate Side-Shifts on the Articulator in the size of 1 to 2/100 of a mm.

**IMPORTANT ADVICE:** For operators who regularly want to use the Immediate Side-Shift Capability of Dentatus Articulators: The Condylar Axis Set Screws (A^3) should **ALWAYS** be kept loose and **NOT** tightened.
CARE OF THE ARTICULATOR

The DENTATUS ARTICULATORS are very carefully machined precision instruments. The demands on their continuous precision can only be fulfilled provided the instruments are given such care as they require. The moving parts must move easily, the calibrations must be accurate etc. in order to give the desired degree of precision. Obviously the Articulators should not be dropped or exposed to other rough and careless treatment.

The different Set Screws and Lock Nuts should be tightened manually and pliers should not be used.

Place plaster only where it belongs on the casts and Mounting Plates. Avoid dropping plaster into any of the moving parts, especially into the Condylar Track. Be careful to protect the Lower Jaw Member during plastering procedures by placing waxed paper around the attached lower Mounting Plate as described on page 23, Step No. 7. Always keep the Articulators meticulously clean. Wipe off plaster immediately after mounting. If the plaster has hardened on the Articulator remove it with a wooden stick, tongue blade or something similar. Never use metal tools.

Clean the Condylar Track and the Condylar Sphere frequently with solvent or similar cleaning fluid and oil these parts subsequently. It is most important that the Condylar Mechanism works freely in order to adjust it properly from the wax records.

All screws and movable parts should be kept lightly oiled. It is also advisable to lightly oil the surfaces of the Articulator which come into contact with the plaster each time the Articulator is going to be used. This will prevent the plaster from adhering to the aluminium and prevent damage by corrosion.