

DIVISIONAL STANDARDIZATION DEPARTMENT RGT

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MAY 1965



# RADIO COMPONENTS FOR DEVELOPING COUNTRIES

N.V. PHILIPS' GLOEILAMPENFABRIEKEN • EINDHOVEN NEDERLAND





**Divisional  
Standardization  
Office  
R.G.T.**

**UNIFORM SET OF RADIO COMPONENTS  
FOR FACTORIES  
IN THE DEVELOPING COUNTRIES**

**AW3-9000**  
sheet 1 of 3  
1st JUNE 1965

**1. INTRODUCTION**

In this document have been established:

- 1.1 the scope and the background which have resulted into the composition of a set of standard components, which are to be used by the designer of radio apparatus destined for manufacture in the developing countries.
- 1.2 A survey of the standards pertaining to the selected elements.
- The various subjects have been specified in the following paragraphs:
- |  |            |
|--|------------|
| scope  | see para.2 |
| directives applied by the committee              | see para 3 |
| area of application                              | see para 4 |
| stabilization period                             | see para 5 |
| directives for deviation from this standard      | see para 6 |
| justified selection of components and techniques | see para 7 |
| survey of standards                              | see para 8 |

**2. SCOPE**

In view of the increasing industrial activities in the developing countries, an urgent need is felt to develop a clear and realistic approach with regard to the future plans for the manufacture of radio apparatus and the relevant components.

In order to study all aspects connected with this fast industrialization process in the developing countries, the RGT management has appointed a committee that will occupy itself with the various problems concerned.

As the problems encountered are not of a purely technical nature but also have commercial aspects, it was decided that besides product engineers representatives of the commercial sector should participate.

**3. DIRECTIVES APPLIED BY THE COMMITTEE**

In selecting the set of standard components the committee has followed the following directives:

- 3.1 Transfer of knowledge to outside factories must be possible; the technical assistance to be based on own experience.
- 3.2 Supply of the selected elements, complete or in piece parts, must be possible from Europe.
- 3.3 The selected elements must link up with future European developments as much as possible.
- 3.4 In principle no product modifications will be introduced; however in cases where product modifications are unavoidable, a solution will be worked out in close co-operation with the relevant developing groups and factories.
- 3.5 Adaptations for mechanised or complicated production techniques, requiring large investments will be studied at the Pilot plant at Utrecht, in close co-operation with the responsible production centres.

**4. AREA OF APPLICATION**

- 4.1 When an order is issued for development it should be clearly indicated if this order applies to developing countries.
- 4.2 Independent of the phase of development of the outside factory in question, the design must always be based on the standard set of components, as mentioned in para 8. The reason for this is that during production of a certain design, the factory may be compelled to switch over from import of piece parts to local manufacture of same.

The degree of integration of the outside factory varies from one factory to another, whereby the following phases can be distinguished.

- a. phase I - Assembly of radio receivers  
For this activity components are supplied by the main centre.
- b. phase II- Super assembly  
Besides assembly of apparatus, also assembly of components takes place.
- c. phase III- Manufacture  
The factory is now to a great extent self-supporting.  
A large number of components and piece parts are made in own factory or by second suppliers.

**5. STABILIZATION PERIOD**

The committee has decided that the selected components are to be produced in the outside factories during a period of at least 5 years.

Arguments for this decision are:

Use with:

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**PHILIPS INDUSTRIES**

**AW3-9000**  
sheet 1 of 3

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- 5.1 For such a stabilization period larger investments are acceptable and a reasonable depreciation on the investments can be realised.
- 5.2 This stabilization period promotes an efficient production process, during which there is sufficient time to make the necessary arrangements for introducing the technique for the following periods.
- 5.3 Such a policy of stabilization also results in a more efficient rendering of technical assistance. As there is no need to concentrate on a great number of techniques, assistance can be given more directly, more adaptable and hence much more intensive.

6. DIRECTIVES FOR DEVIATION FROM THIS STANDARD

It is visualized that there may be certain designs which for reasons of size or other requirements, may make the application of the components mentioned in para 8 rather difficult. In such circumstances permission to deviate from this standard can be granted only under the authority of the highest responsible management member of the organisation ordering the design. A note containing the reasons for deviation from the standard component should be sent to the Divisional Standardization Department RGT, for the attention of the secretary of the committee "Components selection for Developing Countries".

7. SELECTION OF COMPONENTS AND TECHNIQUES

7.1 Taking into account an economical investment and the technical possibilities, the committee has come to the conclusion that for the time being the designs must be based on one of the following techniques:

7.1.1 The A-technique, under which are classified all those components which can be applied to the printed boards with a grid pitch of 2.54 mm (e-grid).

7.1.2 The B-technique, under which are ranged all those components linking-up with the miniature technique with a grid pitch of 0.635 mm (E-grid).

7.2 The selection of these elements is primarily directed to the production of apparatus which are in highest demand in the developing countries, viz. battery-fed transistor apparatus, for medium wave and short wave.

Components for other apparatus in A-technique:  
Under consideration.

7.3 Components for B-technique

Technological, material and investment problems, linked up with the B-technique, are of such a nature that a quick introduction in the factories as yet is not justified.

This has led to the decision of abandoning for the next few years a miniature technique for the developing countries.

8. SURVEY OF STANDARDS FOR A- TECHNIQUE

8.1 Set of standards for battery-fed transistor apparatus for medium wave and short wave:

- AW3-9010 - Variable capacitors
- AW3-9020 - Trimmers
- AW3-9030 - Fixed capacitors
- AW3-9040 - Fixed resistors
- AW3-9050 - Potentiometers
- AW3-9060 - Wave length switches
- AW3-9070 - Loudspeakers
- AW3-9080 - Coils
- AW3-9090 - Ferroceptors
- AW3-9100 - Transformers ( under consideration)

8.2 Set of standards for mains-fed transistor apparatus

- AW3-9010 - Variable capacitors
- AW3-9020 - Trimmers
- AW3-9032 - Fixed capacitors (under consideration)
- AW3-9042 - Fixed resistors (under consideration)
- AW3-9052 - Potentiometers (under consideration)
- AW3-9060 - Wave length switches
- AW3-9070 - Loudspeakers
- AW3-9080 - Coils
- AW3-9090 - Ferroceptors
- AW3-9102 - Transformers (under consideration)

8.3 Set of standards for transistor apparatus for long wave

- AW3-9010 - Variable capacitors
- AW3-9020 - Trimmers
- AW3-9030 - Fixed capacitors
- AW3-9040 - Fixed resistors
- AW3-9050 - Potentiometers
- AW3-9060 - Wave length switches
- AW3-9070 - Loudspeakers
- AW3-9082 - Coils (under consideration)
- AW3-9092 - Ferroceptors (under consideration)
- AW3-9100 - Transformers (under consideration)

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## 8.4 Set of standards for transistor apparatus for F.M.

- AW3-9012 - Variable capacitors (under consideration)
- AW3-9020 - Trimmers
- AW3-9030 - Fixed capacitors
- AW3-9040 - Fixed resistors
- AW3-9050 - Potentiometers
- AW3-9060 - Wave length switches
- AW3-9070 - Loudspeakers
- AW3-9084 - Coils (under consideration)
- AW3-9100 - Transformers (under consideration)

## 8.5 Set of standards for car radio's

(Under consideration)

## 8.6 Set of standards for valve sets

(Under consideration)



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VARIABLE CAPACITORS  
for application and manufacture in  
developing countries

AW3-9010

sheet 1 of 4

1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic the procedure to be followed and a survey of relevant standards AW3-9000

dimensions in mm

1. INTRODUCTION

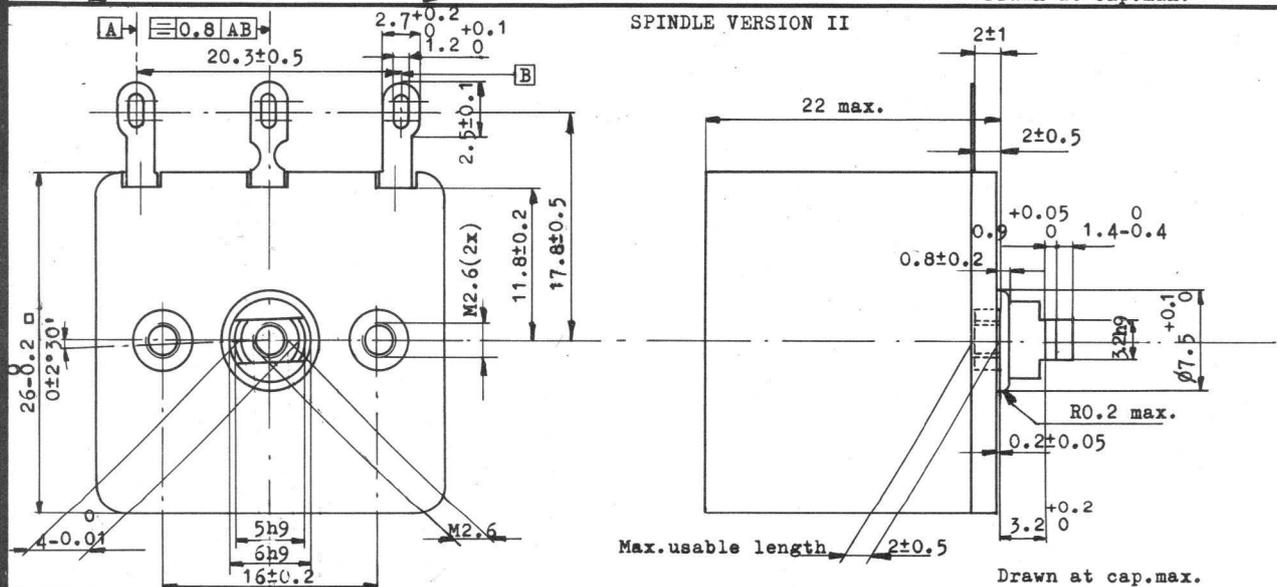
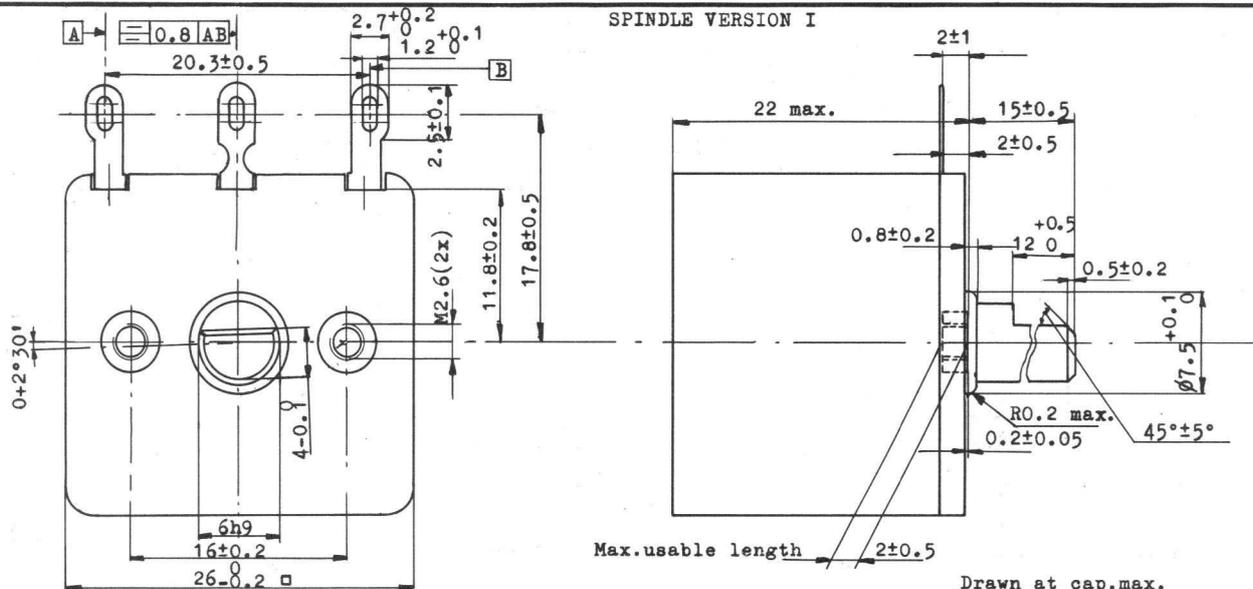
In this document data regarding development, manufacture and application of the variable capacitor Y2U have been established.

Only this variable capacitor may be applied in apparatus destined for manufacture in developing countries.

With the aid of the set of standard components (see AW3-9011), 9 types of capacitors can be made, viz. with 3 different capacitances: 180 pF, 270 pF and 370 pF, each with three different spindle versions. Further data are given in the following paragraphs:

dimensioned sketch	see para 2
code numbers	see para 3
specification	see para 4
directions for application	see para 5
standard piece parts	see para 6
motivation of selection	see para 7
other standards	see para 8

2. DIMENSIONED SKETCH



Use with: AW3-9000, AW3-9011

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AW3-9010

sheet 1 of 4

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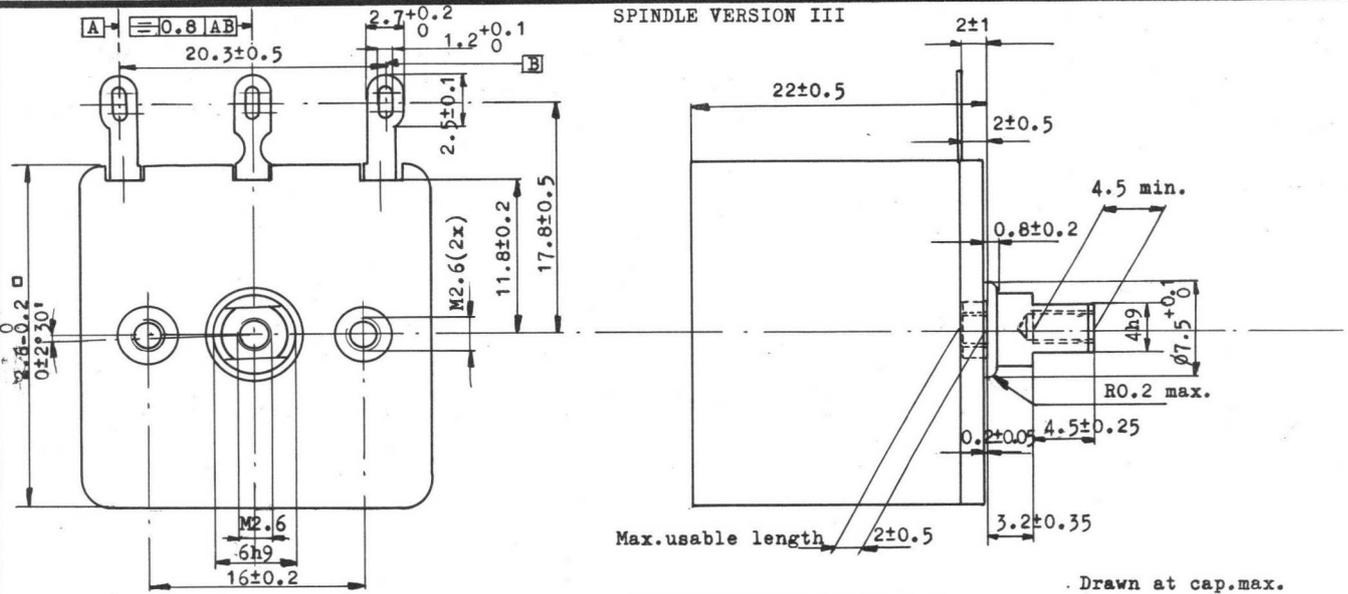
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SPINDLE VERSION III



3. CODE NUMBERS

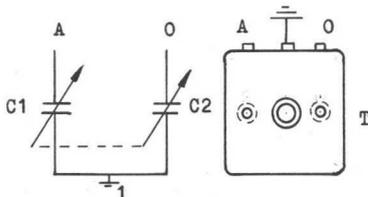
table 1

type	spindle version		
	I	II	III
Y2U-180	49 003 08	49 003 13	49 003 03
Y2U-270	49 003 06	49 003 11	49 003 01
Y2U-370	49 003 04	49 003 09	49 002 99

4. SPECIFICATION

Circuit diagram Connections

Definitions



The reference point is the point reached after turning-in the rotor against stop at max. capacitance. The corresponding angle of rotation is assumed to be 180°. The reference point serves as the point of departure for plotting the law of the variable capacitance  $C_v$  corresponding to the values mentioned in table 2.

Direction of rotation of drive spindle at increasing capacitance: clockwise.

$C_1 C_2$  : Sections numbered in sequence, seen from drive side

$C_v$  : Variable capacitance

$C_{min.}$  : Minimum capacitance  
This is the capacitance of a section when the rotor is turned out against stop

$C_{par.}$  : Total capacitance at an angle of 174° from reference point used during determination of the disparity of law

$D_a$  : Absolute disparity for a section C expressed in % of the low of capacitance +  $C_{par.}$

Nominal increase of capacitance

table 2

$C\alpha$	6	10	20	40	60	90	120	150	180	
Y2U-180	$C_{v2}$	0							180	
	$C_{v1}$	with respect to $C_{v2}$								
Y2U-270	$C_{v2}$								270	
	$C_{v1}$	with respect to $C_{v2}$								
Y2U-370	$C_{v2}$	0	1.25	6.35	20.0	39.65	88.4	166.4	268.0	370
	$C_{v1}$	with respect to $C_{v2}$								

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table 3

	Y2U-180	Y2U-270	Y2U-370
TEMPERATURE COEFFICIENT $\times 10^{-6}$ pF/pF°C			-200 $\pm$ 200
WORKING TEMPERATURE	-25°C +70°C	-25°C +70°C	-25°C +70°C
MAX.TORQUE AGAINST STOP	5 kg.cm	5 kg.cm	5 kg.cm
DRIVE TORQUE	max.400 gr.cm	max.400 gr.cm	max.400 gr.cm
RADIAL SPINDLE LOAD	0.4 kg.cm	0.4 kg.cm	0.4 kg.cm
MAX.AXIAL SPINDLE LOAD	1 kg	1 kg	1 kg
TEST VOLTAGE - measured between A,0-1	300 V---	300 V---	300 V---
INSULATION RESISTANCE - measured between A,0-1	$\geq 10^4$ Mohm	$\geq 10^4$ Mohm	$\geq 10^4$ Mohm
PARALLEL DAMPING at 1.5 Mc/s	$\geq 3$ Mohm	$\geq 3$ Mohm	$\geq 3$ Mohm
ACCURACY OF ADJUSTMENT			
C <sub>min.</sub>	-	-	$\geq 4.5 \pm 1$ pF
C <sub>par.</sub>	25 pF	35 pF	50 pF
Da	$\pm 2\%$	$\pm 2\%$	$\pm 2\%$
ANGLE OF ROTATION	174° + 5°	174° + 5°	174° + 5°

5. DIRECTIONS FOR APPLICATION

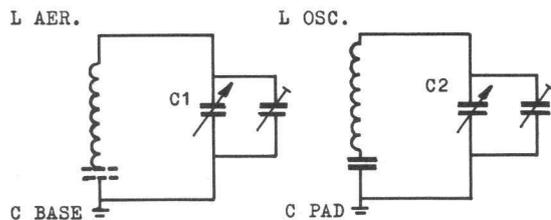


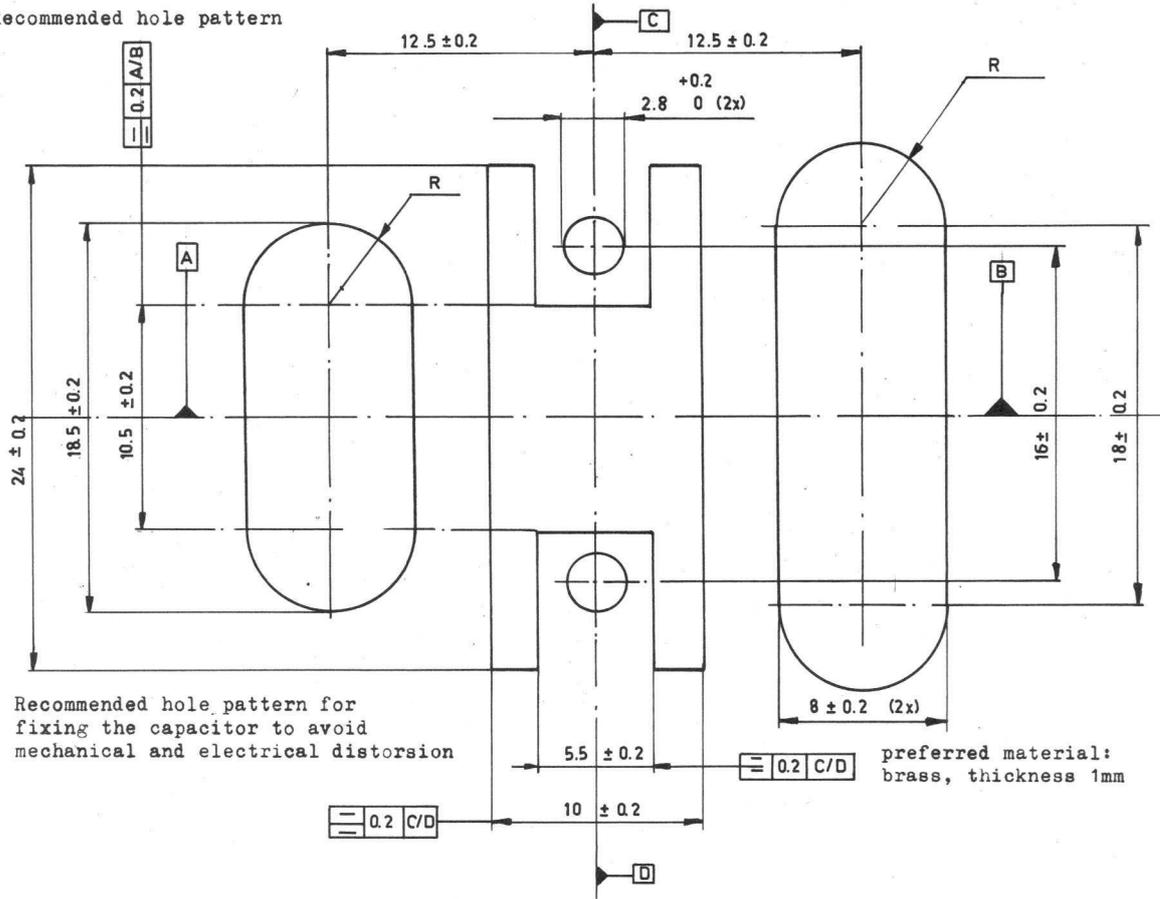
table 4

	Y2U-180		Y2U-270		Y2U-370	
BASE COUPLING CAPACITANCE in pF	none	3000	none	3000	none	3000
PADDING CAPACITANCE in pF					384	300
Co AERIAL CIRCUIT in pF					39.0	34.4
Co OSCILLATOR CIRCUIT in pF					48.1	42.3
INDUCTANCE AERIAL COIL in $\mu$ H					240	275
INDUCTANCE OSCILLATOR COIL in $\mu$ H					136	157
FREQUENCE RANGE MW in kHz	512 - 1635		512 - 1635		512 - 1635	
INTERMEDIATE FREQUENCY MW in kHz	452		452		452	

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(5.) Recommended hole pattern



Recommended hole pattern for fixing the capacitor to avoid mechanical and electrical distortion

preferred material: brass, thickness 1mm

6. STANDARD PIECE PARTS

The standard parts for the variable capacitors have been listed in AW3-9011.

7. MOTIVATION OF SELECTION

7.1 Advantages of the variable foil capacitors over the variable air dielectric capacitor.

- a. The foil capacitor is considerably smaller.
- b. The electrical properties are comparable; the disparity of law of the foil capacitor remains within the required 2% tolerance.
- c. The foil capacitor links up with future developments in the field of variable capacitors.

7.2 Motivation of the selection of the Y2U range

- a. The Y2U capacitors have such a construction that with the aid of a set of standard components various versions with different capacitances and spindle types can be realised.
- b. With the selected capacitances 180, 270 and 370 pF, an adequate AM radio production programme can be realised.
- c. In the cost of the Y2U range the labour component is predominant.
- d. The assembly tools are rather simple and do not require large investments.
- e. The dimensions (26 mm square, 22 mm high) are still suitable for application in camera size apparatus and portables.

7.3 Notes

- a. The standard components of the foil capacitor require in respect to capacitors with air as dielectric a higher accuracy. The manufacture of the parts requires large investments.
- b. Supply of the foil may cause difficulties; at the moment only a few suppliers are known who are able to comply with the specification and quality requirements of this material.
- c. A higher capacitance than 370 pF cannot be realised for these dimensions.

8. OTHER STANDARDS

AW3-9011 Standard components for Y2U variable capacitors.



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**PIECE PARTS FOR VARIABLE CAPACITORS**  
for application and manufacture in  
developing countries

**AW3 - 9011**  
sheet 1 of 4  
1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries.  
See for the entailing problematic, the procedure to be followed and a survey of relevant standards AW3-9000.

**1. INTRODUCTION**

In this standard the piece parts for the variable capacitors Y2U have been listed.  
No parts other than those specified on this sheet may be used for the assembly of Y2U- capacitors.  
For more detailed information see AW3-9010.  
The following subjects are specified in the paragraphs mentioned:

standard piece parts	see para 2
exploded view and piece parts Y2U-180	see para 3
exploded view and piece parts Y2U-270	see para 4
exploded view and piece parts Y2U-370	see para 5

**2. STANDARD PIECE PARTS**

In this paragraph the code numbers of the standard piece parts have been listed.  
The item numbers in the table below refer to the drawings of the piece parts around the exploded views.

1	cap	4322 090 00550	13	nut	2522 401 05005
2	solder tag	4322 090 04060	14	insulator plate	49 111 76
3	solder tag	4322 090 04070	15	nut	2522 401 05003
4	shaft (version I)	4322 090 04050	16	fixing bush	4322 090 00480
5	shaft (version II)	4322 090 04000	17	earth tag	4322 090 04080
6	shaft (version III)	4322 090 00460	18	backplate	4322 090 00580
7	rotor plate	4322 090 00520	19	ring	4322 090 00510
8	corrector plate	4322 090 00440	20	ring	49 110 52
9	stator plate	4322 090 00430	21	ring	4322 090 04020
10	front plate assy	4322 090 00530	22	ring	4322 090 04010
11	nut	49 110 33	23	bush	4322 090 04030
12	stator support	4322 090 00540	24	bush	4322 090 04040

**3. EXPLODED VIEW AND PIECE PARTS Y2U-180**

See sheet 2.

**4. EXPLODED VIEW AND PIECE PARTS Y2U-270**

See sheet 3.

**5. EXPLODED VIEW AND PIECE PARTS Y2U-370**

See sheet 4.

Use with: AW3 - 9000, AW3 - 9010

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**AW3 - 9011**

sheet 1 of 4

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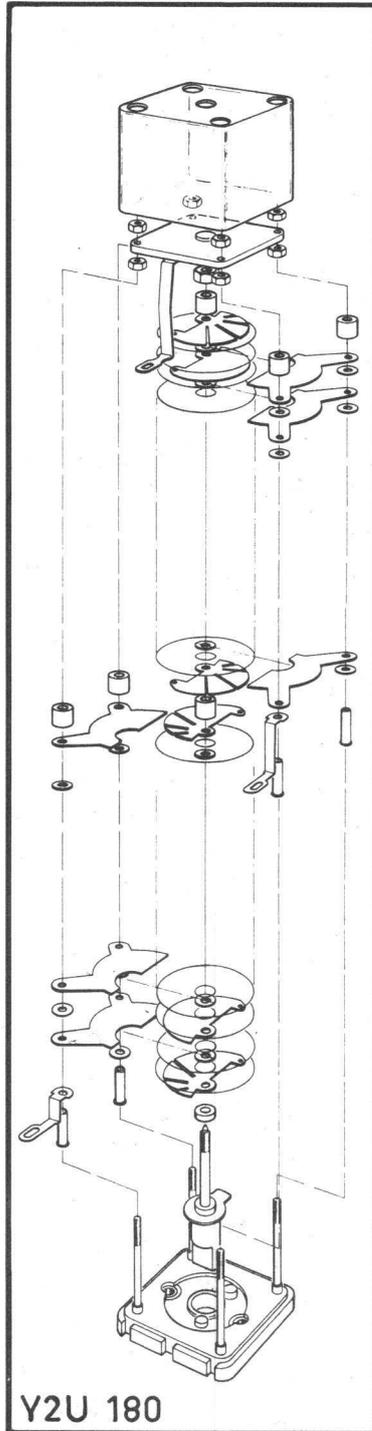
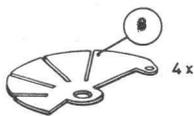
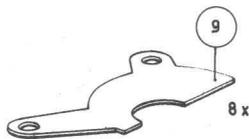
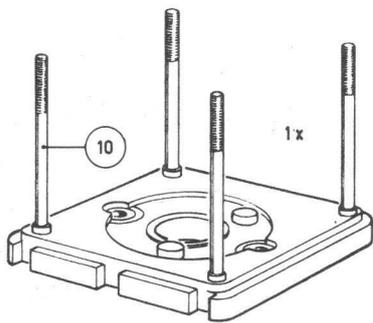
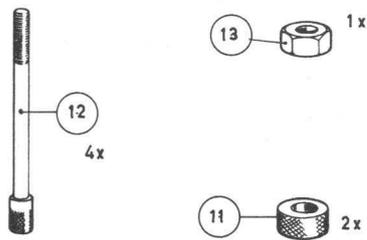
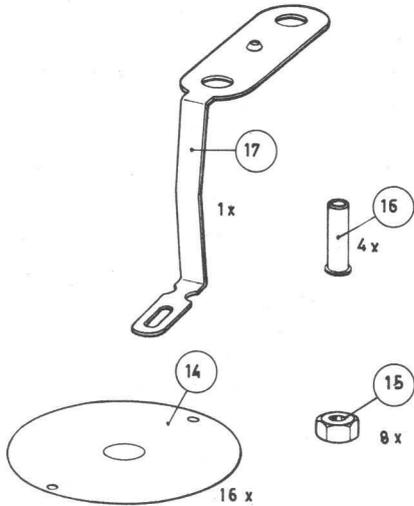
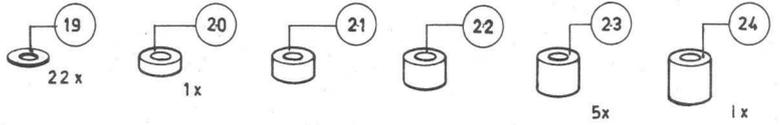
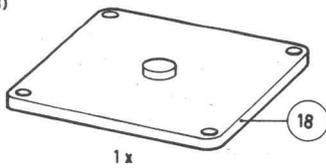
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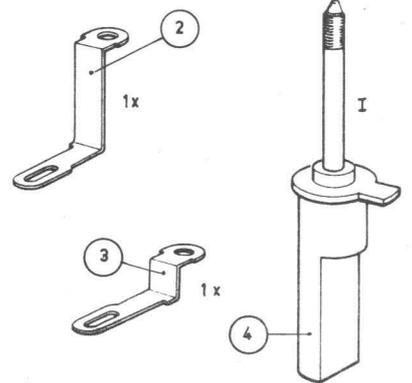
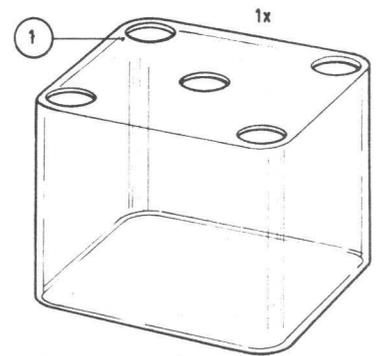
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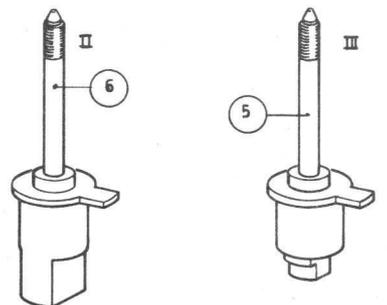
(3)



Y2U 180



1x shaft I, II or III

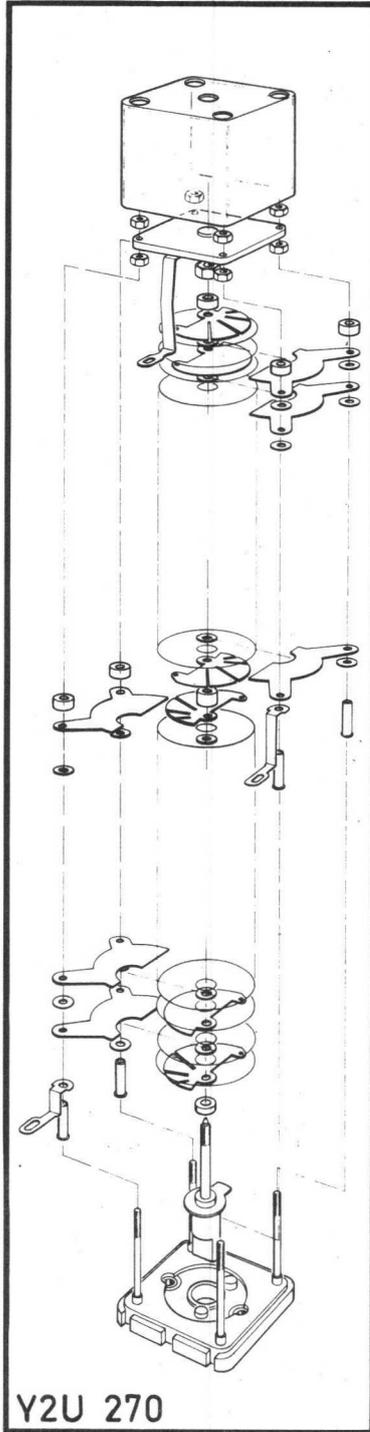
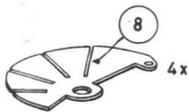
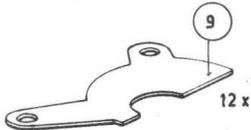
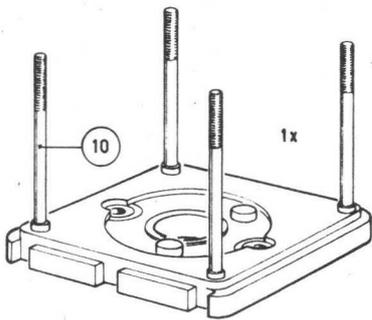
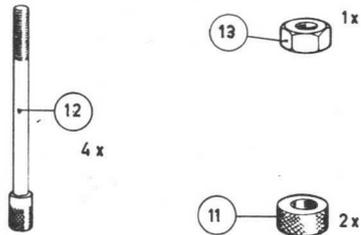
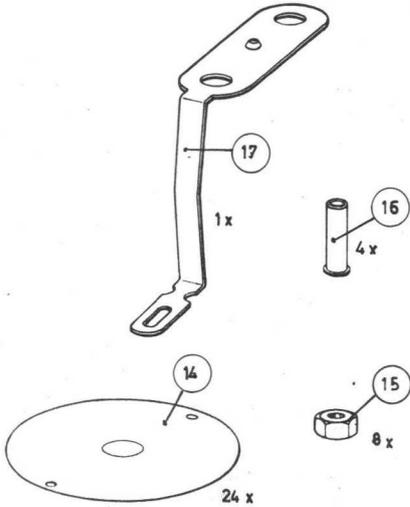
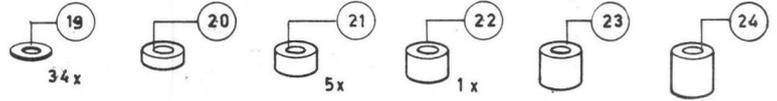
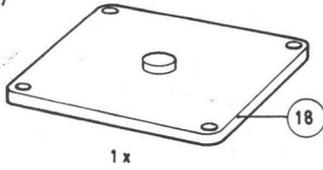


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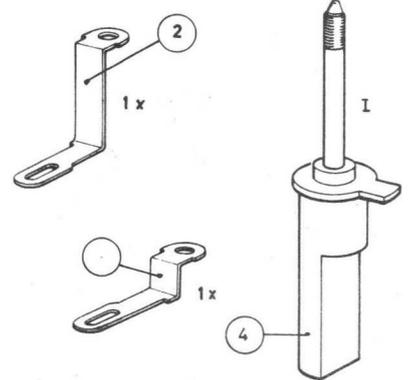
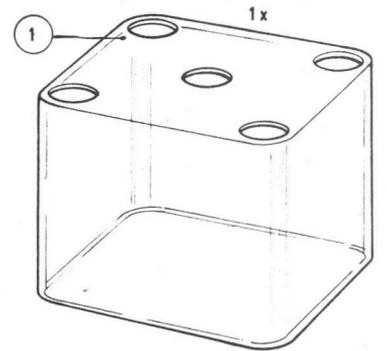
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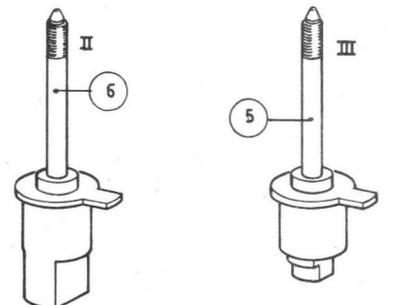
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Y2U 270



1x shaft I, II or III

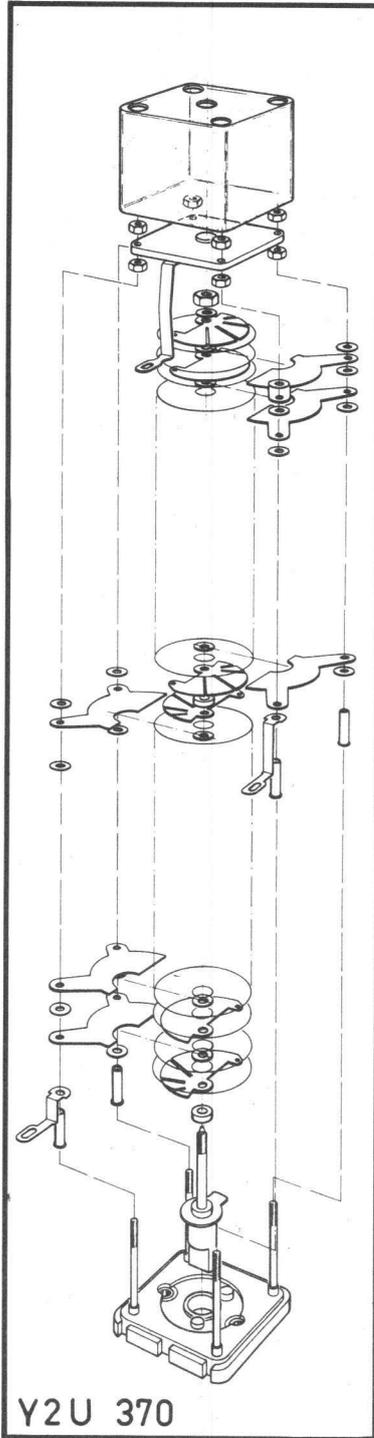
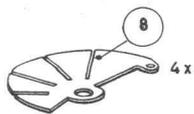
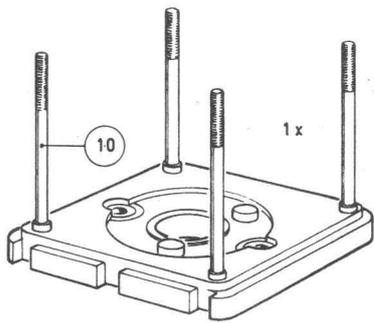
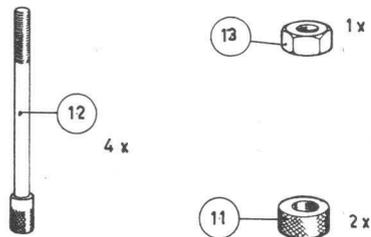
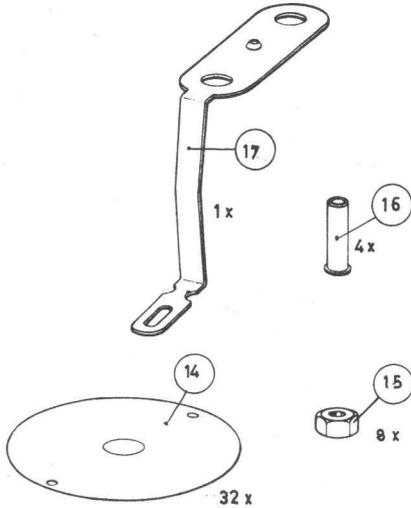
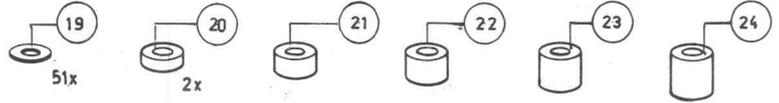
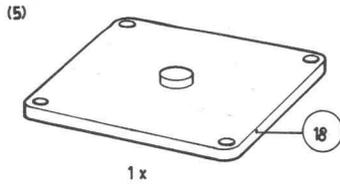


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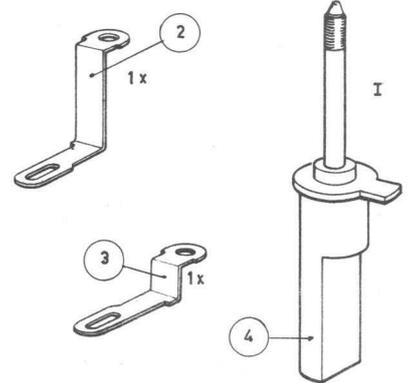
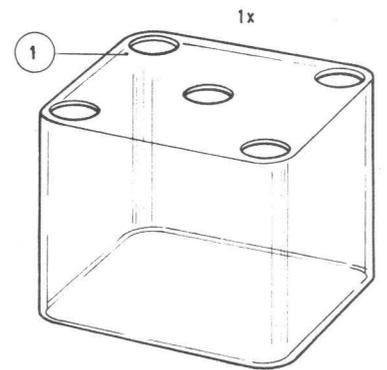
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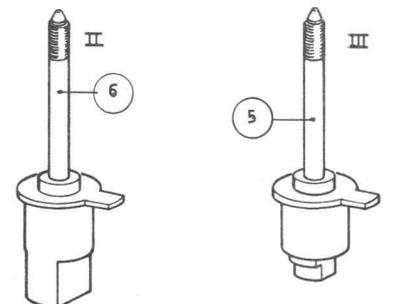
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Y2U 370



1x shaft I, II or III





dimensions in mm

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic, the procedure to be followed and a survey of relevant standards AW3-9000.

1. INTRODUCTION

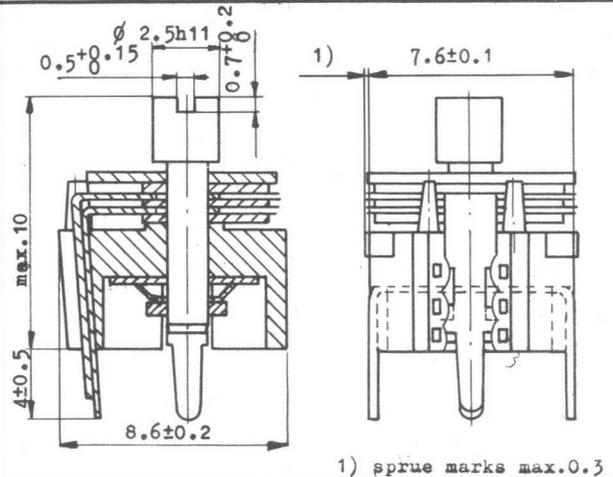
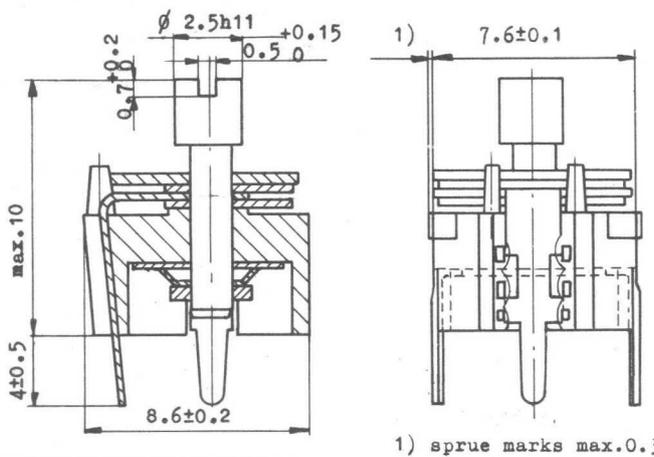
In this document data regarding development, manufacture and application of trimmers with solid dielectric for printed wiring type A, have been established. Only these trimmers may be applied in apparatus destined for manufacture in developing countries. With the aid of the set of standard piece parts (see AW3-9021) two type of trimmers can be made, with nominal values of 10 and 20 pF. Further data are given in the following paragraphs:

dimensioned sketch	see para 2
code numbers	see para 3
specification	see para 4
directions for application	see para 5
standard components	see para 6
motivation of selection	see para 7
other standards	see para 8

2. DIMENSIONED SKETCH

Fig. 1

Fig. 2



3. CODE NUMBERS

fig.	value	code number	denomination
1	10 pF	C 010 EA/10E	foil dielectric trimmer $\phi$ 7.5 mm
2	20 pF	C 010 EA/20E	for printed wiring type A

4. SPECIFICATION

	10 pF	20 pF
Working temperature	-40°C+70°C	-40°C+70°C
Temp. coefficient	$-450 \pm 500 \cdot 10^{-6} \text{ pF/p}^\circ\text{C}$	$-450 \pm 500 \cdot 10^{-6} \text{ pF/p}^\circ\text{C}$
Max. working voltage	50 V top	50 V top
Axial spindle load $\Delta C$ at $K = 200 \text{ gr}$	$\leq 0.1 \text{ pF}$	$\leq 0.1 \text{ pF}$
Minimum drive torque	10 gram	10 gram
Maximum drive torque	150 gram	150 gram
Test voltage	300 V $\overline{\text{--}}$	300 V $\overline{\text{--}}$

	10 pF	20 pF
Maximum capacitance	$\cong 8.5 \text{ pF}$	$\cong 18.5 \text{ pF}$
Minimum capacitance	$\cong 1.5 \text{ pF}$	$\cong 1.5 \text{ pF}$
Accuracy of adjustment	$\cong 0.1 \text{ pF}$	$\cong 0.1 \text{ pF}$
Continuity	$\cong 0.02 \text{ pF}$	$\cong 0.02 \text{ pF}$
Insulation resistance S-R - S-H - R-H	$\cong 10^4 \text{ M}\Omega$	$\cong 10^4 \text{ M}\Omega$
Parallel damping 1.5 Mc/s	$\cong 10 \text{ M}\Omega$	$\cong 10 \text{ M}\Omega$
Contact resistance	$\cong 10 \text{ m}\Omega$	$\cong 10 \text{ m}\Omega$

Use with: AW3-9000, AW3-9021

Replaces NEW

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PHILIPS INDUSTRIES

AW3-9020

sheet 1 of 2

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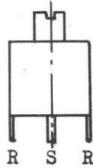


Fig. 3

Direction of rotation arbitrary  
Maximum capacitance is obtained when the rotor and stator  
vanes cover each other entirely

5. DIRECTIONS FOR APPLICATION

The trimmers are provided with tags for mounting them to printed boards type A.  
For hole pattern see fig. 4

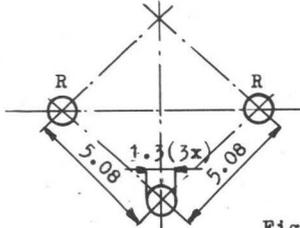


Fig. 4

The foil dielectric trimmer can be used as a  
variable capacitance in radio circuits

6. STANDARD COMPONENTS

The standard piece parts for the foil dielectric trimmers have been listed in AW3-9021.

7. MOTIVATION OF SELECTION

- .1 Comparison between foil dielectric trimmer, tubular ceramic trimmer and air gap trimmer.
  - a. The foil dielectric trimmer is considerably smaller.
  - b. The electrical properties are comparable.
  - c. The foil trimmer links up with future developments in the field of trimmers.
- .2 Selection of foil dielectric trimmer
  - a. The trimmer is built up from a set of standard components; with a small extension of the set of standard components the trimmer can be made suitable for application to printed boards type B.
  - b. In the cost of the foil dielectric trimmer the labour component is great.
  - c. The assembly tools are not complicated and do not require large investments.
  - d. The dimensions (7.5 mm  $\phi$ , approx. 10 mm high) are suitable for application in camera-size and pocket apparatus.
- .3 Notes
  - a. The standard components are difficult to be manufactured; they require skill and much experience.
  - b. The supply of foil may cause difficulties; at the moment only a few manufacturers are known who are able to comply with the consumer's material specification and quality requirements.

8. OTHER STANDARDS

AW3-9021 Standard components for foil dielectric trimmers.

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PIECE PARTS FOR TRIMMERS  
for application and manufacture in  
developing countries

AW3 - 9021  
sheet 1 of 3  
1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic, the procedure to be followed and a survey of relevant standards AW3-9000.

1. INTRODUCTION

In this standard piece parts for the trimmers have been listed. No parts other than those may be used for the assembly of trimmers for developing countries. For more detailed information see AW3-9020.

The following subjects are specified in the paragraphs mentioned

standard piece parts see para 2  
exploded view and piece parts 10 pF trimmer see para 3  
exploded view and piece parts 20 pF trimmer see para 4

2. STANDARD PIECE PARTS

In this paragraph the code numbers of the standard piece have been listed.

The item numbers in the table below refer to the drawings of the piece parts around the exploded views.

		old code number	new code number
1	shaft	XB 311 95	4322 092 04840
2	cover plate	XB 614 17	4322 092 04850
3	ring	XB 808 18	4322 090 00130
4	stator vane		4322 090 00810
5	insulator	XB 614 18	4322 092 04860
6	ring	XB 808 19	4322 090 00190
7	spring	XB 540 92	4322 090 00180
8	rotor contact plate		4322 090 00800
9	casing(colour cream)		4322 090 05950
	casing(colour green)		4322 090 05960
10	rotor vane	XB 661 55	4322 092 04890

3. EXPLODED VIEW AND PIECE PARTS 10 pF TRIMMER  
See sheet 2.

4. EXPLODED VIEW AND PIECE PARTS 20 pF TRIMMER  
See sheet 3.

Use with: AW3 - 9000, AW3 - 9020

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AW3 - 9021  
sheet 1 of 3

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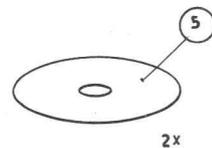
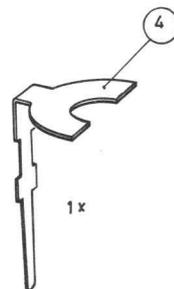
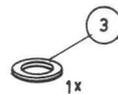
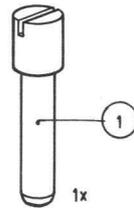
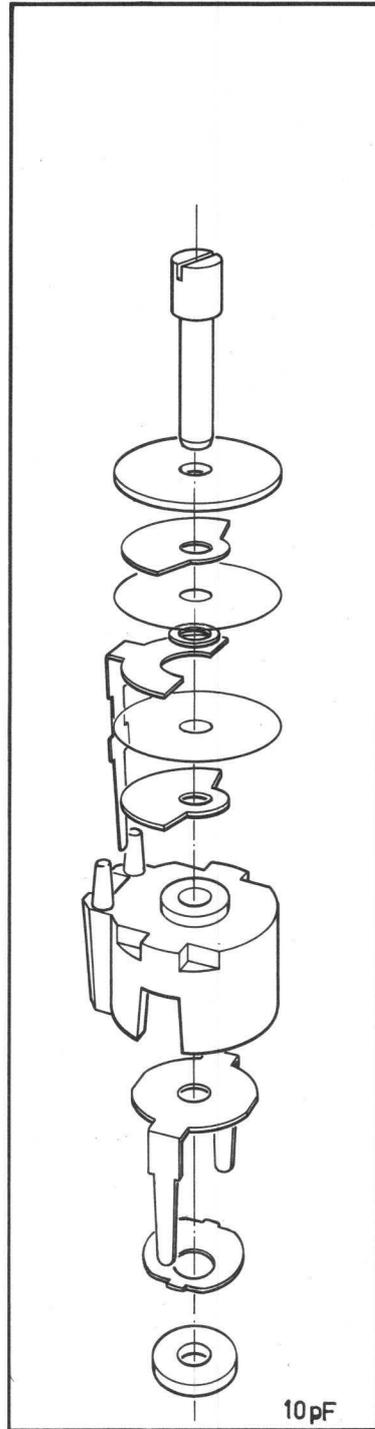
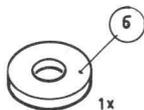
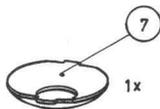
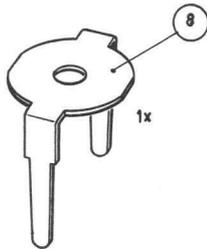
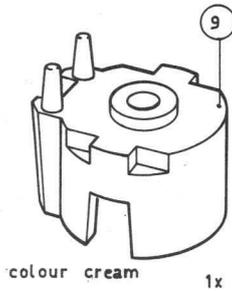
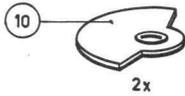
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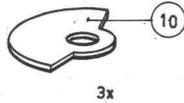


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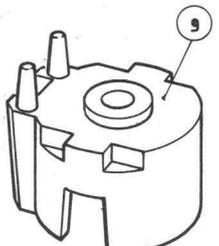
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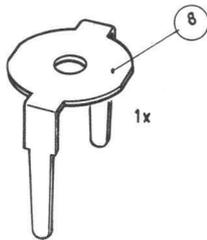
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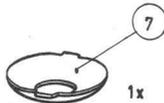
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colour green 1x



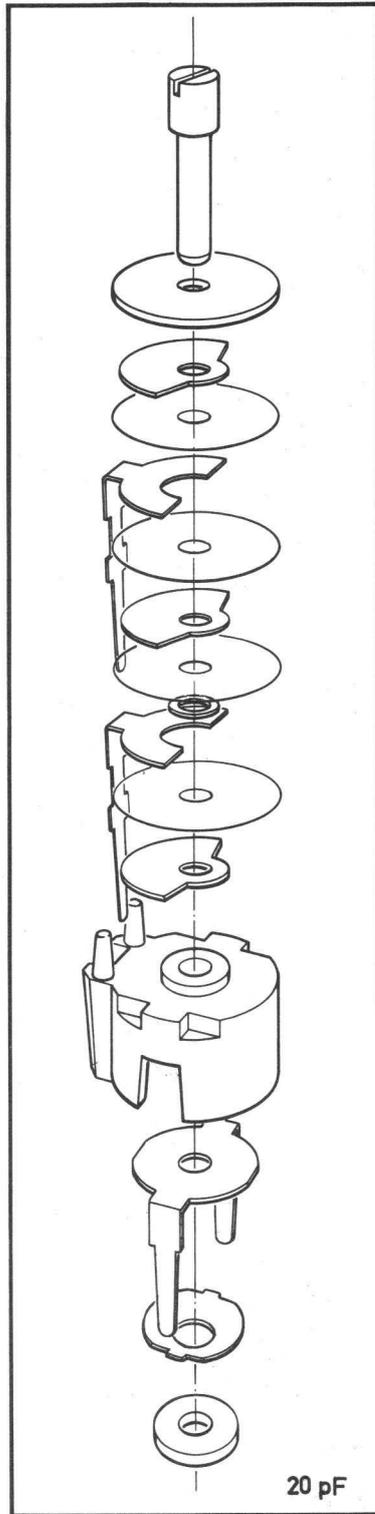
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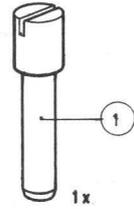
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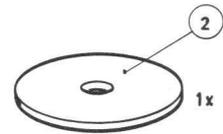
1x



20 pF



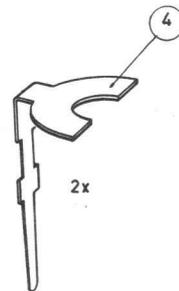
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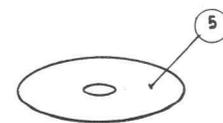
1x



2x



2x



4x



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**FIXED CAPACITORS**  
for application and manufacture in  
developing countries

**AW3 - 9030**  
sheet 1 of 2  
1st JUNE 1965

This document gives direction to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic, the procedure to be followed and a survey of the relevant standards AW3-9000.

**1. INTRODUCTION**

In this document a selection is made from the total ICOMA range of capacitors. Only the capacitors mentioned in this directive, are to be applied in apparatus destined for manufacture in developing countries.

Further data are specified in the following paragraphs

polyester capacitors	see para 2
polystyrene capacitors	see para 3
ceramic capacitors	see para 4
electrolytic capacitors	see para 5
motivations of this selection	see para 6
survey of capacitances	see para 7

**2. POLYESTER CAPACITORS**

Selection: POLYESTER capacitor  
for further specification: see PRT-C 296  
Application: on printed boards type A (e = 2.54 mm)

**3. POLYSTYRENE CAPACITORS**

3.1 Selection: STYROFLEX capacitor  
for further specification: see PRT-C 285  
Restriction: only the AA (63 V---) and the AB (400 V---) are to be applied

3.2 Selection: MINIPOCO capacitor  
for further specification: see PRT-C 295  
Application: on printed boards type A (e = 2.54 mm)

**4. CERAMIC CAPACITORS**

4.1 Selection: CERAMIC capacitor type 1 class 1B  
for further specification: see PRT-C 304  
Restriction: only the range C 304 GB/... (NPO) and the range C 304 GH/... (N750)  
Application: on printed boards type A (e = 2.54 mm)

4.2 Selection: CERAMIC capacitor type 2  
for further specification: see PRT-C 322  
Application: on printed boards type A (e = 2.54 mm)

4.3 Selection: MINIKERCO capacitor  
for further specification: see PRT-C 302  
Restriction: Only to be applied in coils

**5. ELECTROLYTIC CAPACITORS**

5.1 Selection: ELECTROLYTIC capacitor C 426  
for further specification: see PRT-C 426  
Restriction: only the insulated and printed wiring versions in economy range may be applied.  
Application: on printed boards type A (e = 2.54 mm)

5.2 Selection: ELECTROLYTIC capacitor C 437  
for further specification see PRT-C 437  
Restriction: only the insulated and printed wiring versions in the preferred range may be applied  
Application: in apparatus with printed wiring type A

**6. MOTIVATION OF SELECTION**

6.1 POLYESTER capacitors  
The POLYESTER capacitor is manufactured in several developing countries; the MEPOLESCO and PLACO (flat foil) capacitors are not yet suitable for manufacturing in rather small series in developing countries.

6.2 POLYSTYRENE capacitors  
The MINIPOCO and STYROFLEX capacitor are the only representatives in the polystyrene capacitor range of ICOMA.

6.3 CERAMIC capacitors  
C 304 (NPO and NP 750) and C 322 have been selected in consultation with ICOMA, in view of the possibility of manufacture in other countries.

Use with: AW3-9000

Replaces NEW

**N.V. PHILIPS' GLOEILAMPENFABRIEKEN EINDHOVEN-NEDERLAND**  
**PHILIPS INDUSTRIES**

**AW3 - 9030**  
sheet 1 of 2

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6.4 ELECTROLYTIC capacitors

The ELECTROLYTIC capacitors C 426 and C 437 (the continuation of the C 426 range) are selected from the most economical range. This selection means a complete electrical range with a minimum of tools and code numbers.

7. SURVEY OF CAPACITANCES

MATERIAL DIELECTRIC	SELECTION acc. to PRT-	VERSION	CAPACITANCE	INTERMEDIARY VALUES (....) acc. to	CAPACITANCE TOL. / VOLTAGE	PROPERTIES APPLICATION	
Polyester	C 296	AA/: 160 V---	10K ..... 1M	E12 range	../A: ±10%	coupling and decoupling capacitance	
		AC/: 400 V---	1K ..... 470K				
Poly-styrene	C 285	AA/: 63 V---	4E, 5E, 6E etc. till 47E ..... 22K	E12 range	../A: ±10 % ../B: ± 5 % ../S: ±2.5% ../D: ±1 %	small dimensions large stability small losses e.g. tuning in high frequency circuits	
		AB/: 125 V---	2E, 3E, etc. till 47E ..... 22K				
	C 295	AH/: 63 V---	3K6 ..... 160K	E24 range	../A: ±10 % ../B: ± 5 % ../C: ± 2 % ../D: ± 1 %		
		AA/: 125 V---	1K5 ..... 82K				
AB/: 250 V---		1K3 ..... 47K					
Ceramic	C 304	GB/: temperature coefficient NPO	1E8 ..... 2E2	E24 range	../N:±0.25pF	small losses large stability linear temperature dependence e.g. tuning purposes + temperature compensation	
			2E4 ..... 10E	E24 range	../L:±0.5 pF		
			5E1 ..... 10E	E24 range	../M:±1 pF		
			11E ..... 220E	E24 range	../B:±5 %		
			12E ..... 220E	E12 range	../A:±10 %		
			15E ..... 220E	E6 range	../P:±20 %		
		GH/: temperature coefficient N 750	27E ..... 220E	E24 range	../C:±2 %		
			51E ..... 220E	E24 range	../D:±1 %		
			E8 ..... 2E2	E24 range	../N:±0.25pF		
			2E4 ..... 10E	E24 range	../L:±0.5 pF		
			5E1 ..... 10E	E24 range	../M:±1 pF		
			11E ..... 820E	E24 range	../B:±5 %		
	C 322	⊗ D/ Δ C / C < 10%	1E5, 2E, 3E, 4E.....10E	E12 range	../M:±1 pF ../P:±20 %	coupling and decoupling capacitor, generally for high frequencies	
			12E ..... 39E				
		⊗ C/ Δ C / C < 25%	47E ..... 10K	E12 range	../P:±20 %		
			⊗ A/ Δ C / C < 40%	1K ..... 10K	E12 range		../H:-20+50%
		⊗) not bent on pitch of e-grid: B, bent on pitch of e-grid:D					
		Electro-lytes	C 426	AR/ insulated version or CB/ printed wiring version	can size 4		can size 6
160 μF	500 μF				../A: 2.5 V		
8, 125 μF	400 μF				../B: 4 V		
32, 100 μF	320 μF				../C: 6.4 V		
25, 64 μF	200 μF				../D:10 V		
2.5, 16, 40 μF	125 μF				../E:16 V		
1.6, 10, 25 μF	80 μF				../F:25 V		
1, 6.4, 16 μF	50 μF				../G:40 V		
0.32, 0.64, 4, 10 μF	32 μF		../H:64 V				
C 437	AR/ insulated version or CB/ printed wiring version		can size 00: 640 μF	can size 01: 1000 μF	../C: 6.4 V		
			can size 00: 400 μF	can size 01: 640 μF	../D:10 V		
			can size 02: 1000 μF	can size 02: 640 μF	../E:16 V		
			can size 00: 250 μF				
			can size 03: 1000 μF	can size 00: 160 μF	../F:25 V		
		can size 00: 64 μF	../H:64 V				

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FIXED RESISTORS  
for application and manufacture in  
developing countries

AW3 - 9040

sheet 1 of 1

1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic, the procedure to be followed and a survey of the relevant standards AW3-9000.

1. INTRODUCTION

In this document a selection is made from the total ICOMA-range of resistors. Only the resistors mentioned in this directive are to be applied in apparatus destined for manufacture in developing countries.

Further data are specified in the following paragraphs:

selection see para 2.  
motivation of selection see para 3.

2. SELECTION

Selection: "ISOKOWEE" resistor

For further specification see PRT-1112.

Restriction: only the 1/4 W resistor may be applied.

Application: on printed boards type A (e = 2.54 mm).

Remark : within a few months the range will be extended to 1 ohm.

3. MOTIVATION OF SELECTION

3.1 Wire resistors are not required for battery sets.

3.2 In order to realise a very limited programme of resistors in developing countries only the use of one range of resistors is allowed.

3.3 For 1/8 W resistors no local equivalents can be obtained.

3.4 In transistorised apparatus a power of 1/4 W will generally be sufficient; if, however, 1/2 W is required, two resistors must be prescribed.

9-1-7 rubr.

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Use with: AW3-9000

Replaces NEW

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PHILIPS INDUSTRIES

AW3 - 9040

sheet 1 of 1



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POTENTIOMETERS  
for application and manufacture in  
developing countries

AW3-9050  
sheet 1 of 1  
1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic, the procedure to be followed and a survey of the relevant standards AW3-9000.

1. INTRODUCTION

In this document a selection is made from the total ICOMA range of potentiometers. Only the potentiometers mentioned in this directive are to be applied in apparatus destined for manufacture in developing countries. Further data are specified in the following paragraphs:

selection potentiometer : see para 2.  
selection trimming potentiometer: see para 3.  
motivation selection : see para 4.

2. SELECTION POTENTIOMETER

A proper selection has not yet been made. The workgroup prefers:

- a) a 23 mm potentiometer with single pole switch and flat end spindle
- b) a 23 mm potentiometer without switch and provided with plug-in spindle

3. SELECTION TRIMMING POTENTIOMETER

Selection: carbon trimming potentiometer  
For further specification see: PRT-E 097  
Restriction: only the version for printed wiring (C) may be prescribed  
Application: on printed boards type A

4. MOTIVATION OF SELECTION

- 4.1 Under consideration
- 4.2 Only suitable trimming potentiometer for printed boards type A.

Use with: AW3-9000

Replaces NEW

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AW3-9050  
sheet 1 of 1

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WAVE-LENGTH SWITCHES  
for application and manufacture in  
developing countries

AW3 - 9060  
sheet 1 of 1  
1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for entailing problematic, the procedure to be followed and a survey of the relevant standard AW3-9000.

1. INTRODUCTION

In this document a selection is made from the RGT range of wave length switches. Only this switch may be used in apparatus destined for manufacture in developing countries. Further data are specified in the following paragraphs:

selection see para 2.  
motivation of selection see para 3.

2. SELECTION

Selection: S6 slide switch acc. to AN-D 610  
For further data see: AW3-0099  
Restriction: No interconnection over top of the slide may be electrically used.  
Application: on printed boards type A

3. MOTIVATION OF SELECTION

1. The switches are not applicable due to their large dimensions and many versions.
- 3.1 S6 switch has small dimensions
- 3.2 S6 switch can easily be assembled
- 3.3 Switch can be applied on B board on a limited scale
- 3.4 S6 switch links up with Eindhoven development

Use with: AW3 - 9000

Replaces NEW

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AW3 - 9060  
sheet 1 of 1

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**LOUDSPEAKERS**  
for application and manufacture in  
developing countries

**AW3 - 9070**  
sheet 1 of 4

1st JUNE 1965

dimensions in mm

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for entailing problematic, the procedure to be followed and a survey of the relevant standard AW3-9000.

**1. INTRODUCTION**

In this document data regarding development, manufacture and application of loudspeakers have been established. Only these loudspeakers are to be applied in apparatus destined for manufacture in developing countries. With the aid of the set of standard piece parts (see AW3-9071) nine basic types of loudspeakers can be made.

Further data are given in the following paragraphs:

- type numbers basic types      see para 3
- standard piece parts            see para 4
- motivation of selection        see para 5
- other standards                 see para 6

**2. DIMENSIONAL SKETCH**

For dimensional sketches see sheet 2 and 3.

**3. TYPE NUMBERS BASIC TYPES**

Dimensions	3" dia	4" dia		5" dia	4" x 6"	7" dia	8" dia
		flat	deep				
Type number	AD2319	AD2419					
basic types			AD3409	AD3506	AD3466	AD3706	AD3806
	AD3319	AD3419					

The basic type is the type serving as a basis for the development and as such it indicates a mechanical version.

The type number of the proper loudspeaker will be completed by adding after the basic type number a letter indication denoting the frequency response curve and nominal impedance of the coil. Loudspeakers applied in apparatus destined for manufacture in developing countries are ONLY TO BE PRESCRIBED IN THE IMPEDANCES 4, 8, 15, 25 AND 50  $\Omega$ , this in connection with the adapted manufacture methods of the coil in these countries.

**4. STANDARD PIECE PARTS**

The standard piece parts for these loudspeakers have been listed in AW3-9071..

**5. MOTIVATION OF THE SELECTION**

**.1 Advantages**

- a. With a minimum numbers of techniques and piece parts, loudspeakers in all acoustical characteristics and classes of sensitivity can be assembled.
- b. The selected loudspeakers link up with future developments in the field of loudspeakers.
- c. In the cost of the loudspeaker the labour component is great.

**.2 Disadvantages**

- a. The magnetic material and cones must be imported.
- b. Restriction of the impedance range up to 50  $\Omega$

**6. OTHER STANDARDS**

AW3-9071 - Piece parts for loudspeakers (for manufacture and application in developing countries).

Use with: AW3 - 9000

Replaces NEW

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**PHILIPS INDUSTRIES**

**AW3-9070**

sheet 1 of 4

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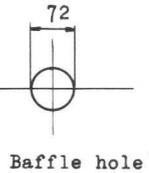
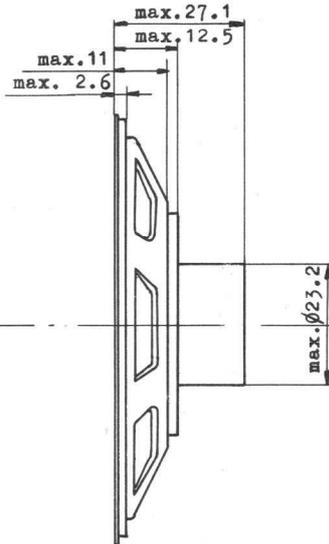
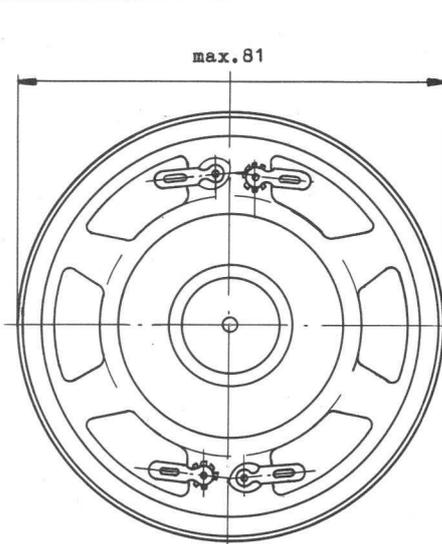
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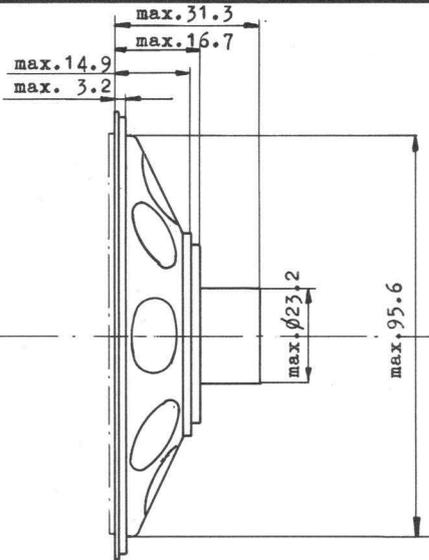
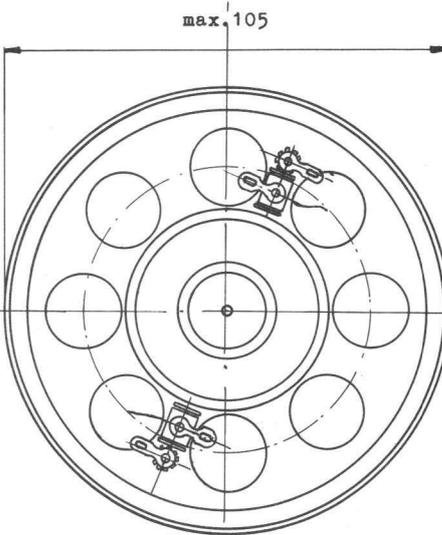
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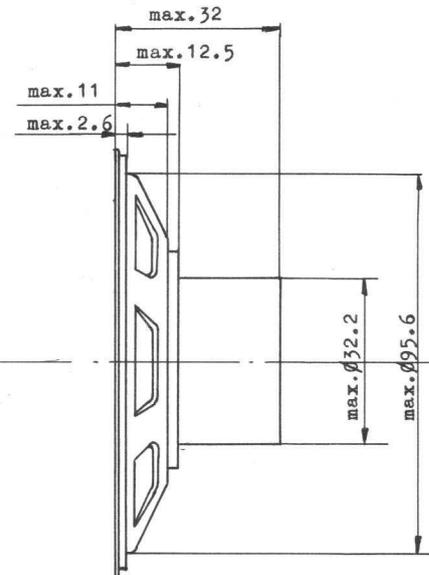
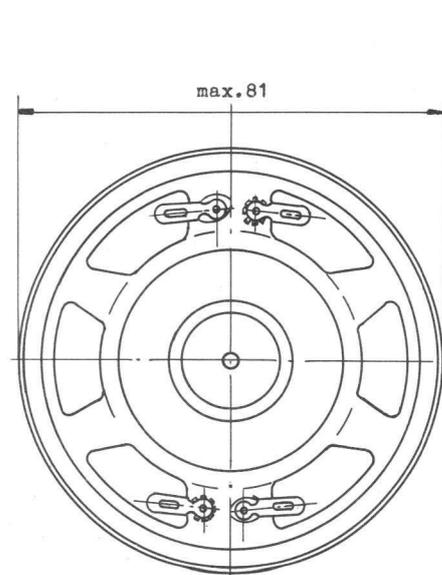


Baffle hole

AD2319



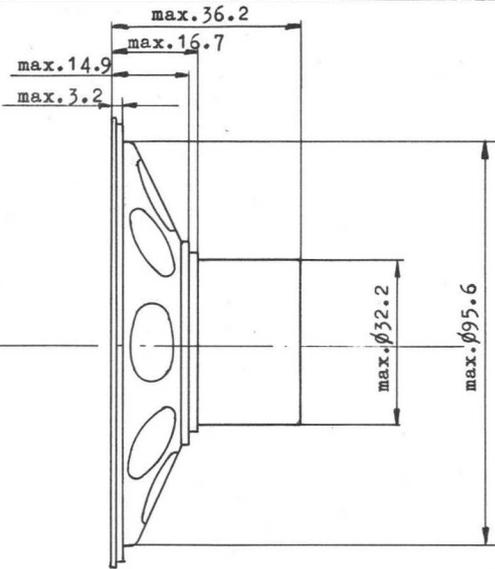
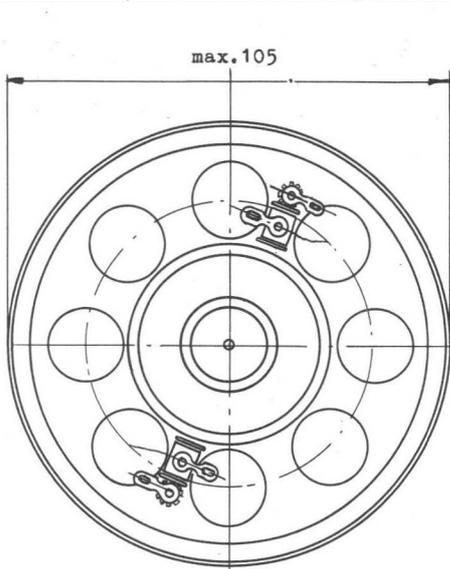
AD2419



AD3319

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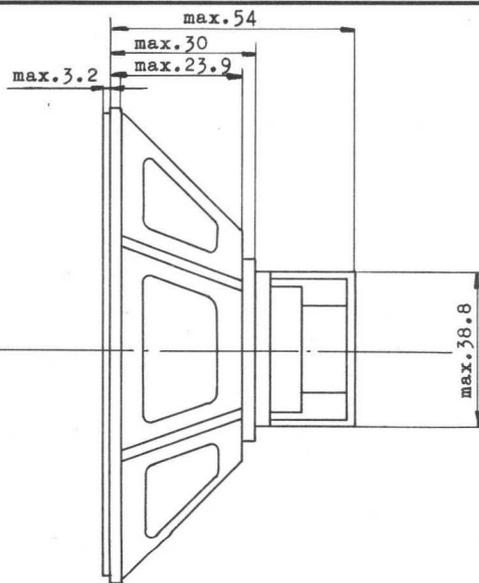
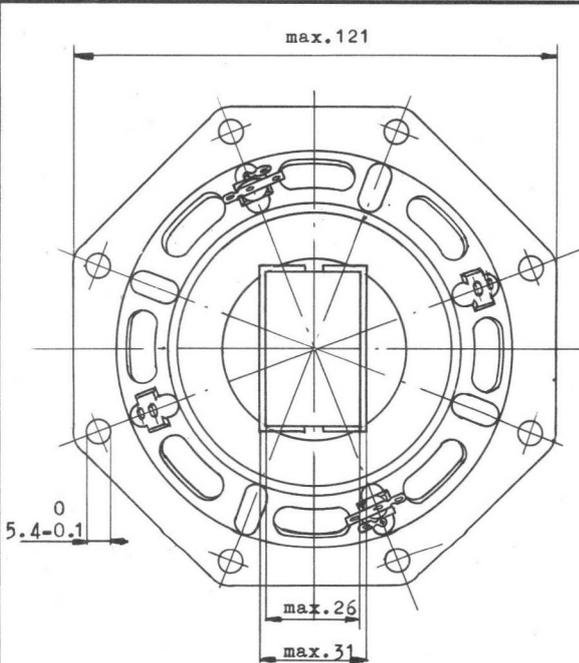
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AD 3419

UNDER CONSIDERATION

AD 3409



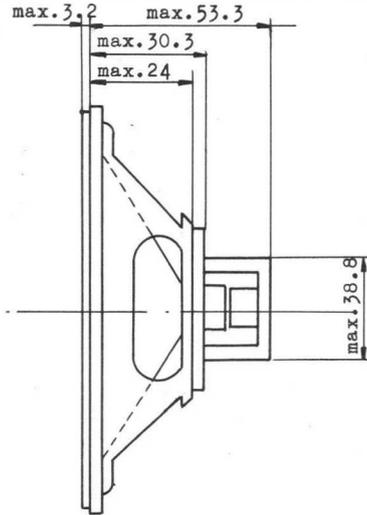
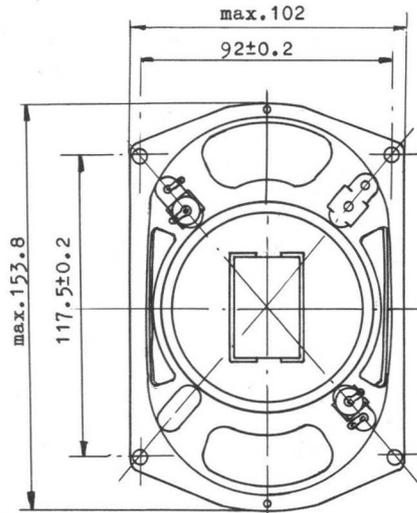
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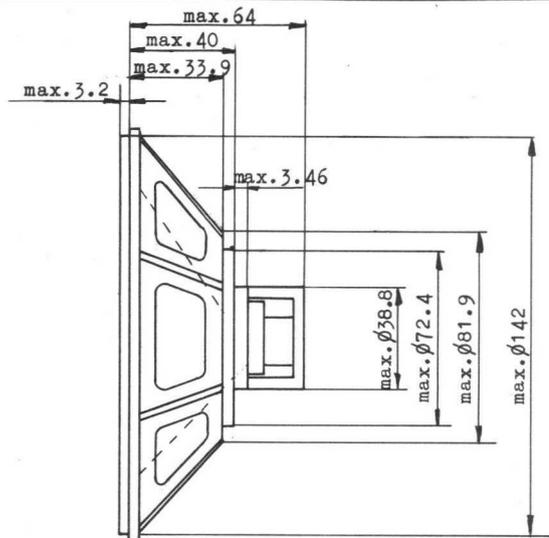
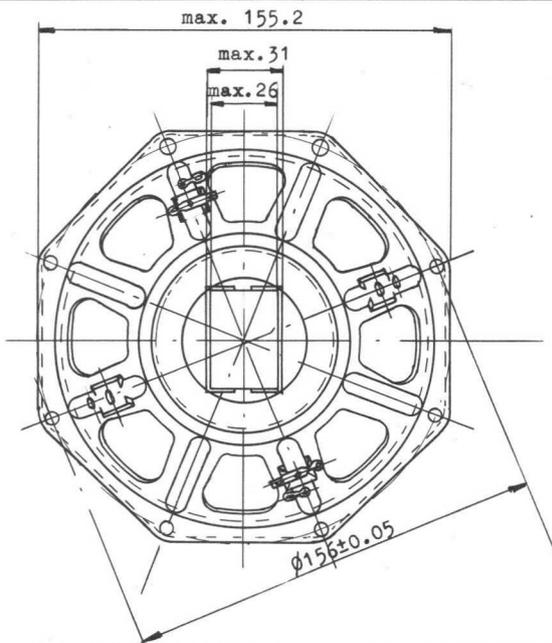
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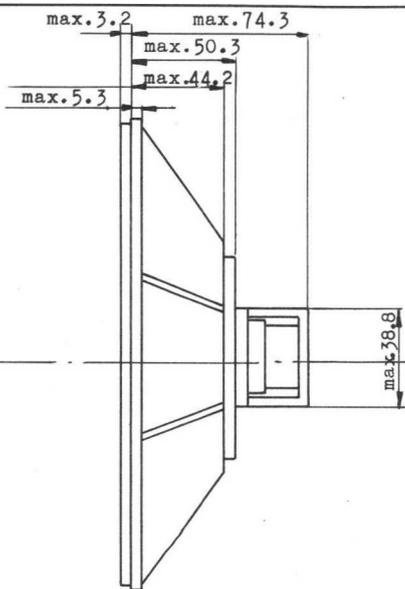
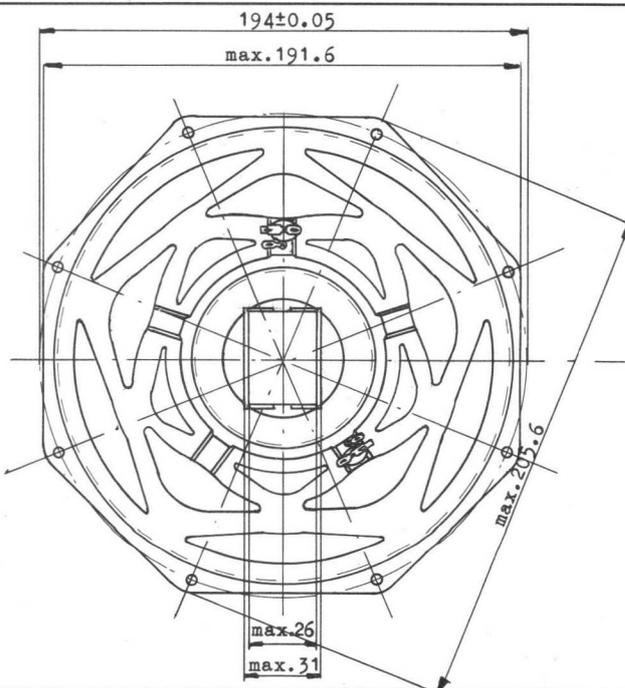
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AD 3466



AD 3706



AD 3806

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COILS

for application and manufacture in  
developing countries

AW3-9080

sheet 1 of 2

1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for entailing problematic, the procedure to be followed and a survey of the relevant standard AW3-9000.

dimensions in mm  
e = 2.54 mm

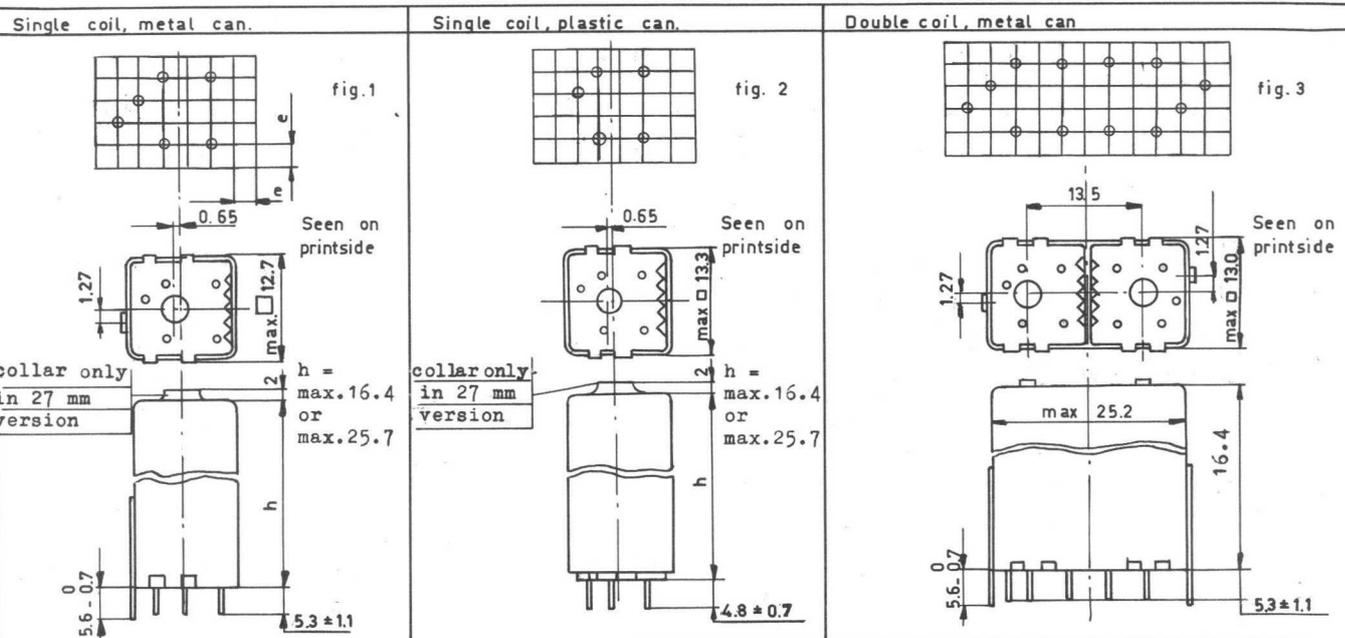
1. INTRODUCTION

In this document data regarding development, manufacture and application of NOVA coils (type LN000) for printed wiring type A have been established. This NOVA coil family has also been standardized in UAN-D 650, only the additions to UAN-D 650 will be stated in this document.

Only these coils are to be applied in apparatus destined for manufacture in developing countries. With the aid of the set of standard piece parts (see AW3-9081) all necessary types of coils can be made. Further data are given in the following paragraphs

- dimensional sketch see para 2
- standard piece parts see para 3
- various types of coils see para 4
- winding data see para 5
- motivations of selection see para 6
- other standards see para 7

2. DIMENSIONAL SKETCH



3. STANDARD PIECE PARTS

The standard piece parts for NOVA coil constructions have been listed in AW3-9081.

4. VARIOUS TYPES OF COILS

A limited number of the constructions as shown in UAN-D 650 has been selected for apparatus destined for manufacture in developing countries.

- .1 Aerial coils M.W.  
In battery-fed transistor apparatus as an aerial coil MW a ferroceptor (see AW3-9090) has to be applied. Only in a few cases (e.g. when it must be possible to switch off the ferroceptor) a NOVA coil construction must be built-in. In such cases the NOVA construction LN273 has to be applied (16 mm double coilcan and two frames).
- .2 Aerial coils S.W.
  - .1 Frame aerial in apparatus
    - a) Frame aerial in series with coil: LN 157 (plastic coilcan, 16 mm) or LN 163 (aluminium coilcan 16 mm and frame)
    - b) Frame aerial parallel with coil: LN 117 (plastic coilcan 27 mm) or LN 163 (aluminium coilcan 16 mm and frame)
  - .2 No frame aerial in apparatus  
In connections with desired coupling coil for aerial connection the 27 mm high NOVA version must be prescribed viz.  
Coil with aluminium coilcan 27 mm: LN 113 or  
Coil with plastic coilcan 27 mm: LN 117.

Use with: AW3-9000, AW3-9081

Replaces NEW

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AW3-9080

sheet 1 of 2

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- .3 IF, rejection and absorption coils,  
aluminium coilcan 16 mm and frame: LN 163
- .4 IF, rejection and absorption circuits  
aluminium coilcan 16 mm, frame and capacitors: LN 164
- .5 IF bandpass coil  
aluminium coilcan 16 mm double, frames and turnable disc: LN 263.
- .6 IF bandpass filter  
aluminium coilcan 16 mm double, frames, turnable disc and capacitors: LN 264.

## 5. WINDING DATA

- .1 Winding wire  
All winding wires as stated in UAN-D 650 may be used, only the use of 30  $\mu$ m stranded wire must be avoided.
- .2 Winding methods  
Two winding methods can be applied:
  - a) Universal winding (see fig.1)  
Only winding widths of 2.0, 3.0, 4.0 and 5.0 mm are allowed,
  - b) Single layer winding (see fig.2)
- .3 Winding direction  
The coil must be wound in the left hand direction  
(see figures 1 and 2)

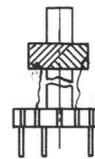


fig.1

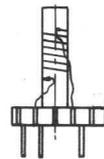


fig.2

## 6. MOTIVATION OF SELECTION

- .1 Comparison with MICRO coil family.
  - a) dimensions of MICRO coils are not suitable for camera size apparatus
  - b) the manufacture is difficult (not suitable for mechanization)
  - c) the MICRO coil has only four connections.
- .2 Comparison with LILLIPUT coil family.
  - a) The LILLIPUT coil family is not suitable for mechanization
  - b) The coil is difficult to be manufactured.
- .3 Advantages of selection of NOVA coil family.
  - a) The NOVA coil is in view of its high degree of suitability for mechanization the coil for the future.
  - b) The NOVA coil serves as an introduction to the next phase of coil development.
  - c) The dimensions 16 mm and 27 mm; especially the 16 mm high version is very suitable for camera size apparatus.

The selection is based on the NOVA coil family with terminals for printed wiring with preference to the 16 mm high version.

## 7. OTHER STANDARDS

AW3-9081 Piece parts of NOVA coils for manufacture and application in developing countries.

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Divisional  
Standardization  
Office  
R.G.T.

PIECE PARTS FOR COILS  
for application and manufacture in  
developing countries

AW3 - 9081  
sheet 1 of 10  
1st JUNE 1965

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic, the procedure to be followed and a survey of relevant standards AW3-9000.

1. INTRODUCTION

In this standard the piece parts for the coils LN000 (Nova) have been listed. No parts other than those specified on this sheet may be used for the assembly of LN000 coils. For more detailed information see AW3-9080. The following subjects are specified in the paragraphs mentioned:

Standard piece parts	see para 2
Cut-away view and piece parts LN113	see para 3
Cut-away view and piece parts LN117	see para 4
Cut-away view and piece parts LN157	see para 5
Cut-away view and piece parts LN163	see para 6
Cut-away view and piece parts LN164	see para 7
Cut-away view and piece parts LN263	see para 8
Cut-away view and piece parts LN264	see para 9
Cut-away view and piece parts LN273	see para 10

2. STANDARD PIECE PARTS

In this paragraph the code numbers of the standard piece parts have been listed. The item numbers in the table below refer to the drawings of the piece parts around the cut-away views.

		old code number	new code number
1	coil former assy		3122 108 18300
	consists of		
	2 printed board	A3 621 61	
	3 wire acc. to AT-K 254		0322 037 21055
	4 printed board assy		3122 108 18320
6	coil former assy		3122 108 18310
	consists of		
	2 printed board	A3 621 61	
	3 wire acc. to AT-K 254		0322 037 21055
	4 printed board assy		3122 108 18320
8	coil former assy		variable per code number coil assy
	9 coil former assy		variable per code number coil assy
	10 frame 4AB		3122 104 92790
	frame 4C5 or		3122 104 92780
	11 core 3B		3122 104 93230
	core 4D		3122 104 93240
	12 coil can assy		3122 108 02830
	13 coil can assy	A3 729 70	
	14 coil can assy	A3 729 68	
	15 coil can	P5 264 20/350LN	
	16 coil can	P5 264 19/350LN	
	17 adjusting disc		3122 108 07320
	18 capacitor	acc.to PRT-C 302	

3. CUT-AWAY VIEW AND PIECE PARTS LN113  
See sheet 3

4. CUT-AWAY VIEW AND PIECE PARTS LN117  
See sheet 4

Use with: AW3 - 9000, AW3 - 9080

Replaces NEW

N.V. PHILIPS' GLOEILAMPENFABRIEKEN EINDHOVEN - NEDERLAND  
PHILIPS INDUSTRIES

AW3 - 9081  
sheet 1 of 10

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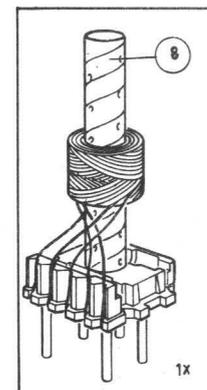
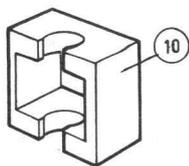
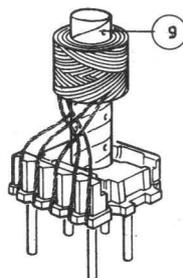
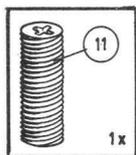
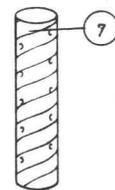
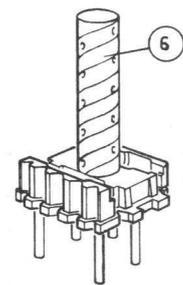
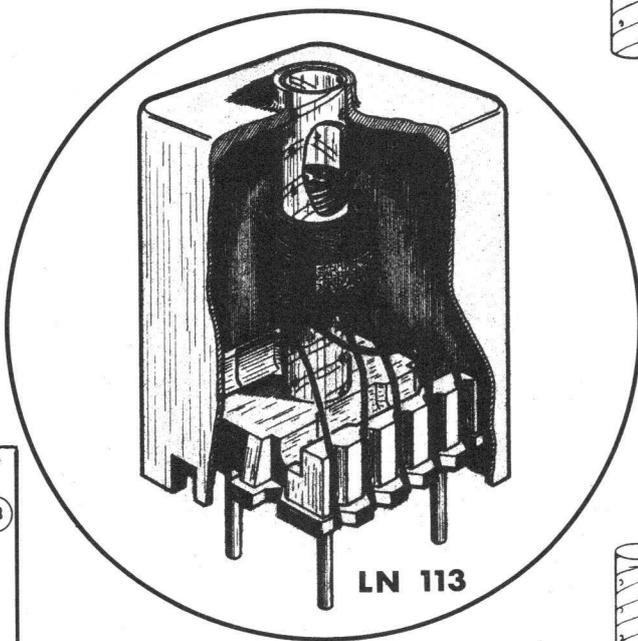
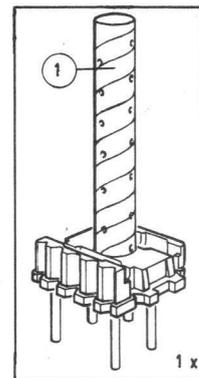
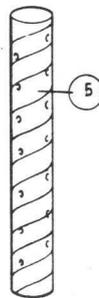
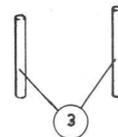
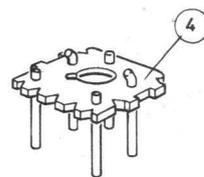
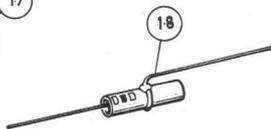
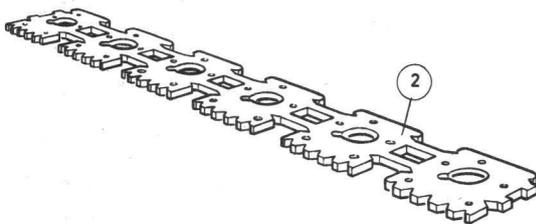
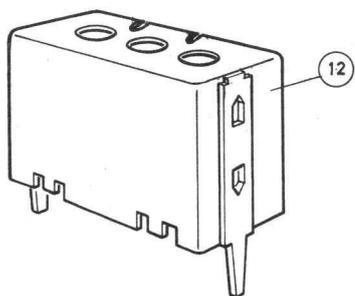
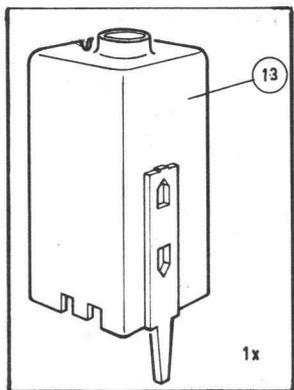
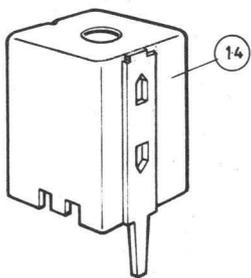
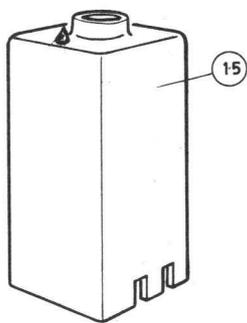
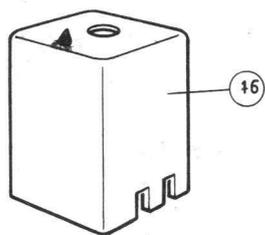
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5. CUT-AWAY VIEW AND PIECE PARTS LN157  
See sheet 5
6. CUT-AWAY VIEW AND PIECE PARTS LN163  
See sheet 6
7. CUT-AWAY VIEW AND PIECE PARTS LN164  
See sheet 7
8. CUT-AWAY VIEW AND PIECE PARTS LN263  
See sheet 8
9. CUT-AWAY VIEW AND PIECE PARTS LN264  
See sheet 9
10. CUT-AWAY VIEW AND PIECE PARTS LN273  
See sheet 10

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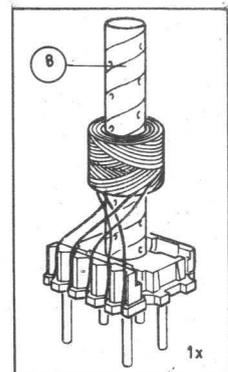
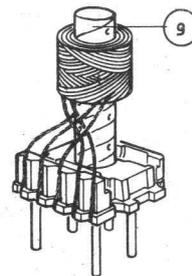
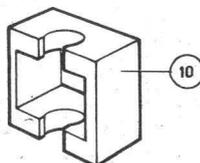
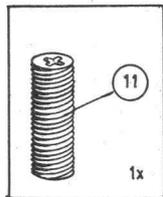
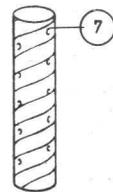
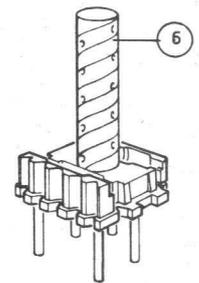
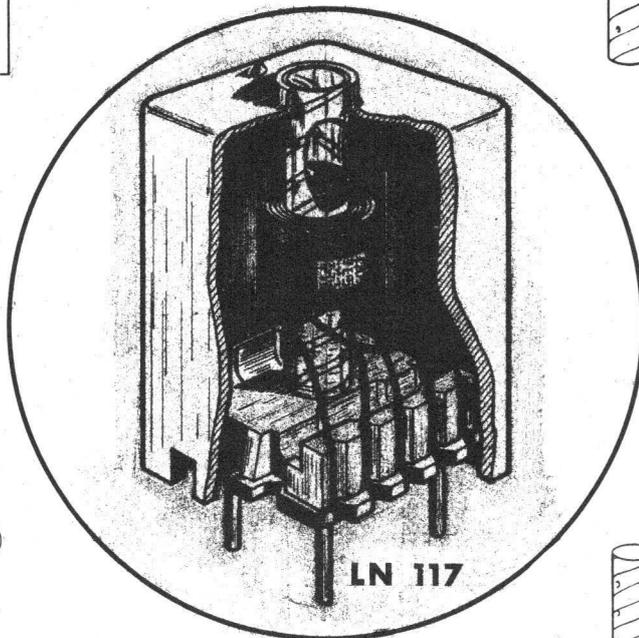
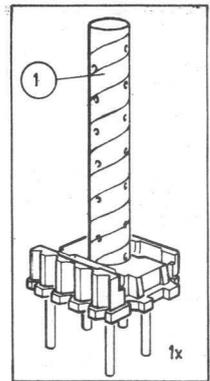
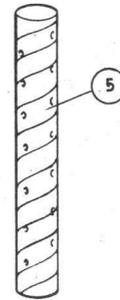
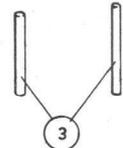
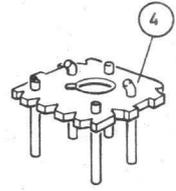
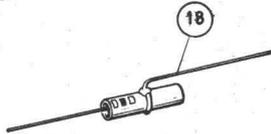
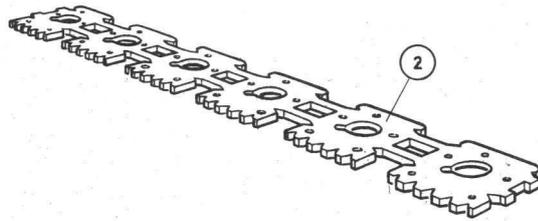
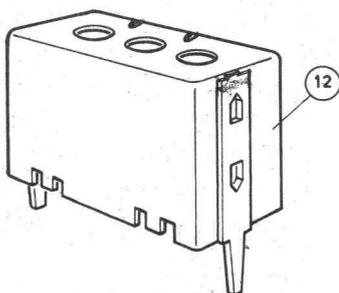
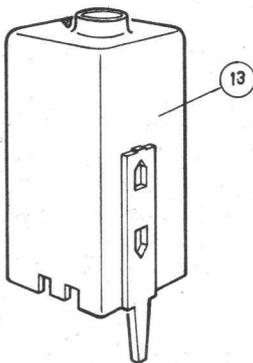
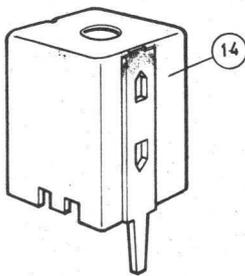
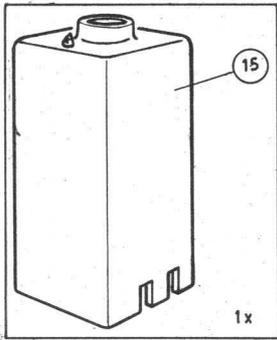
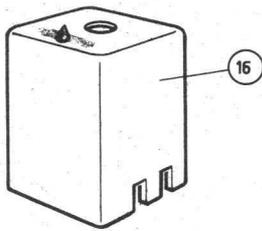


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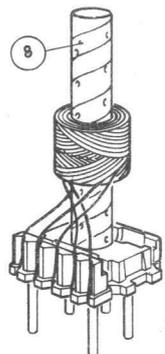
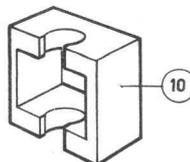
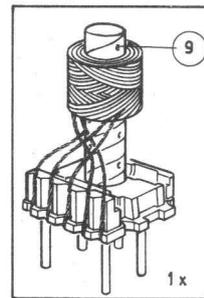
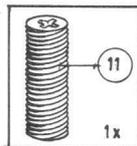
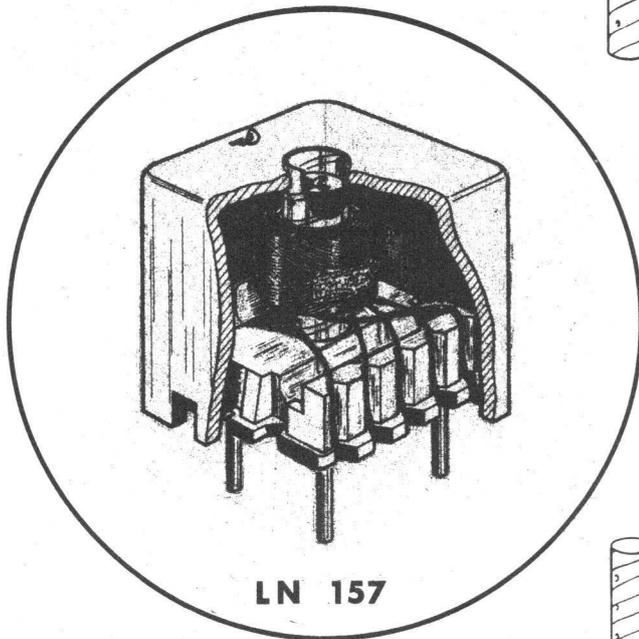
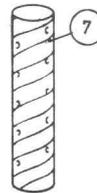
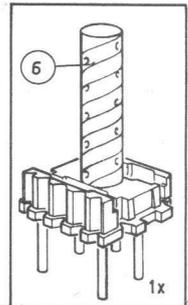
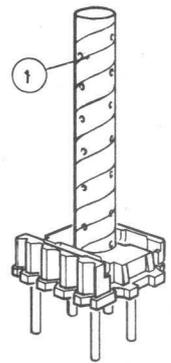
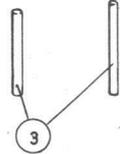
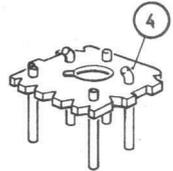
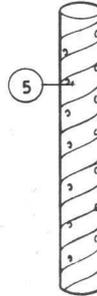
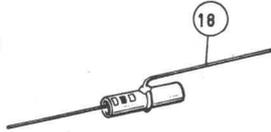
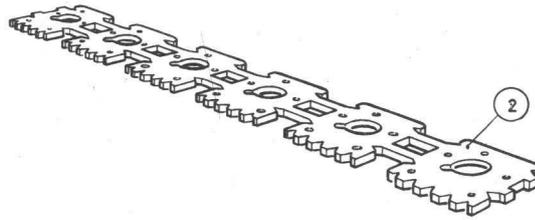
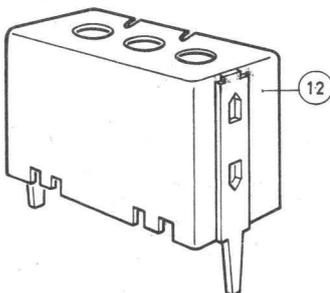
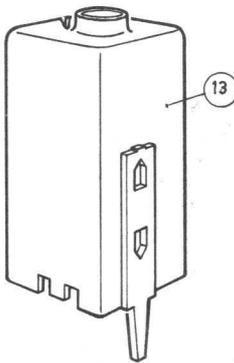
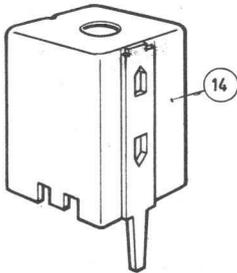
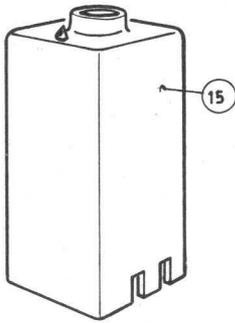
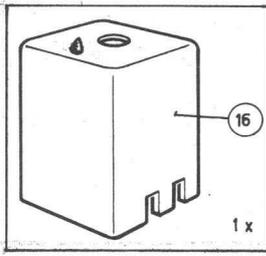


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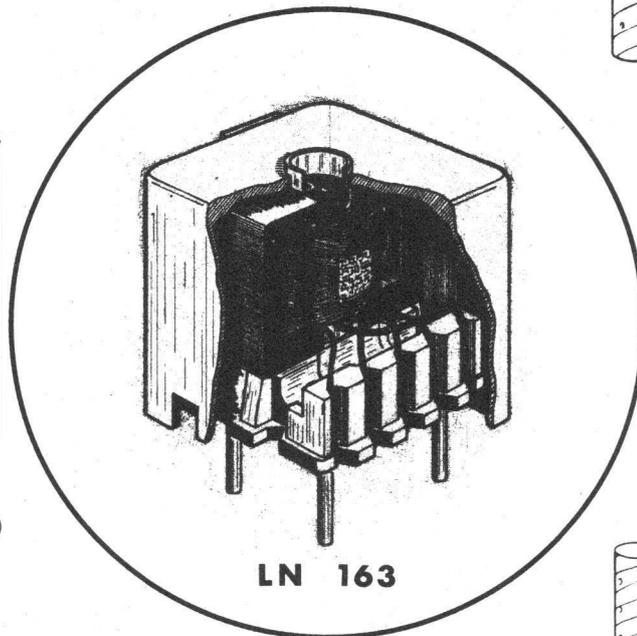
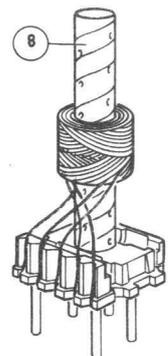
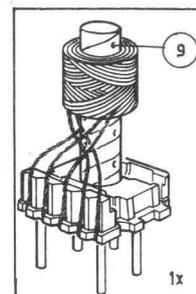
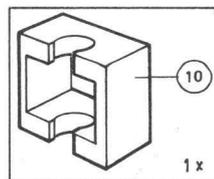
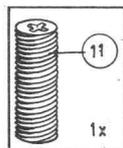
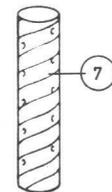
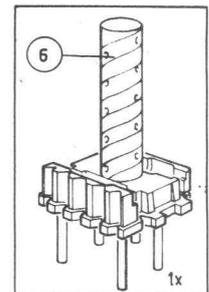
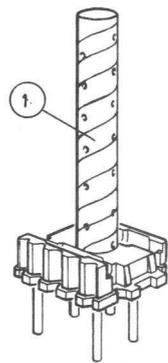
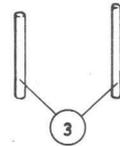
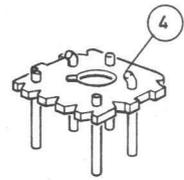
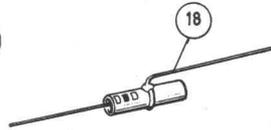
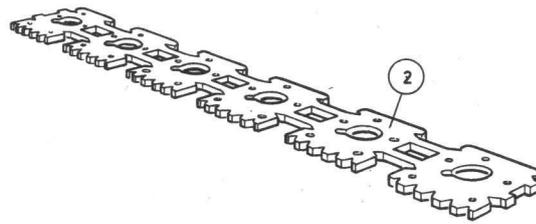
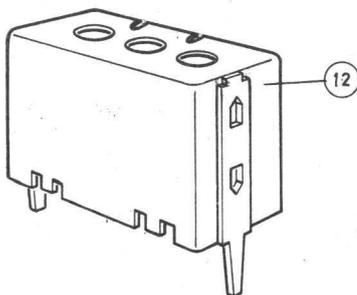
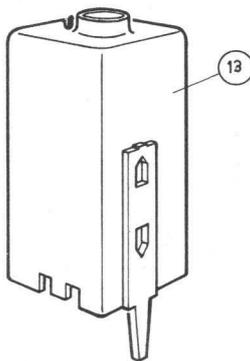
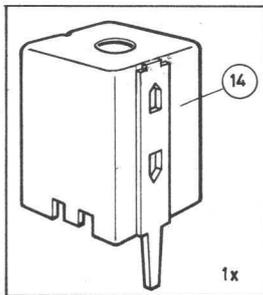
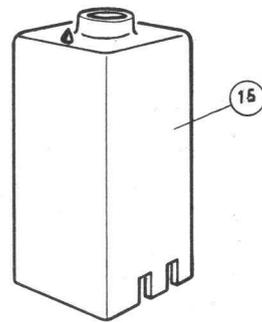
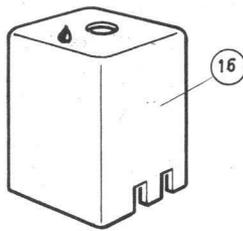


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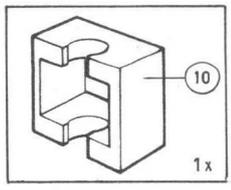
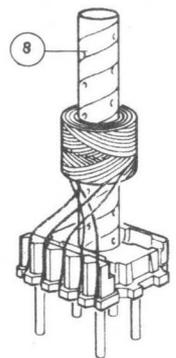
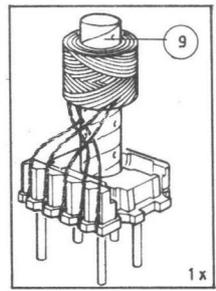
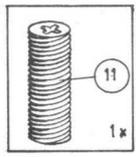
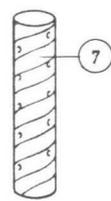
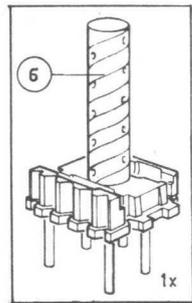
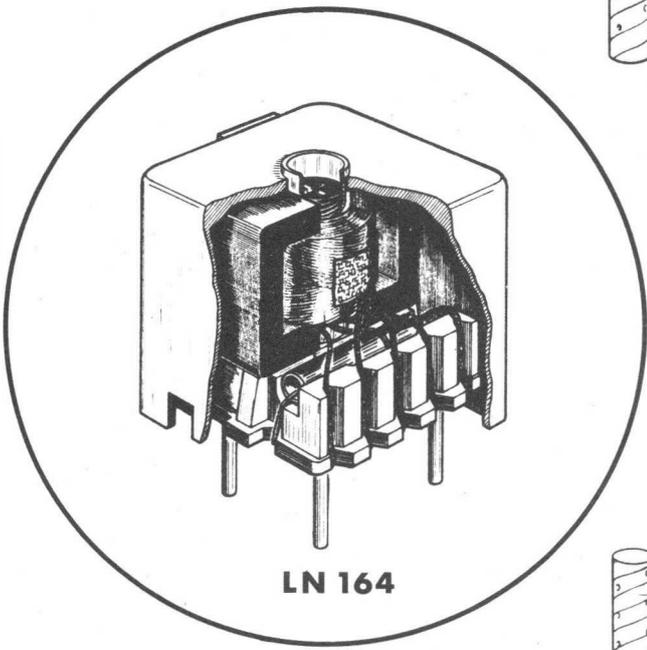
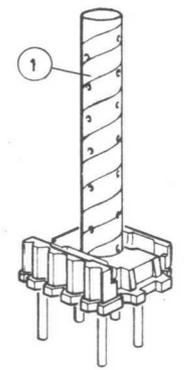
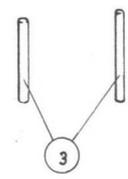
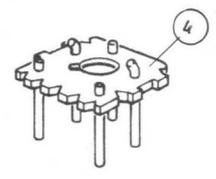
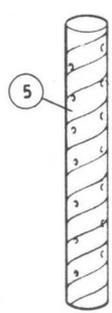
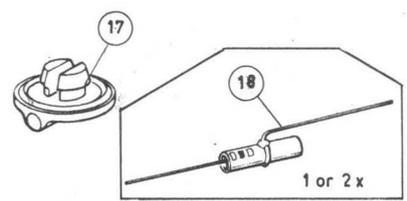
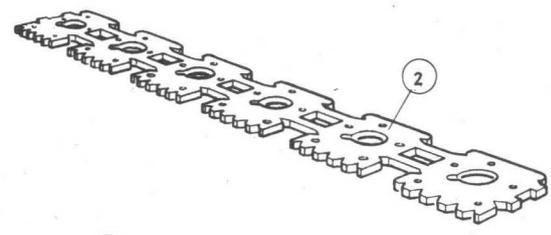
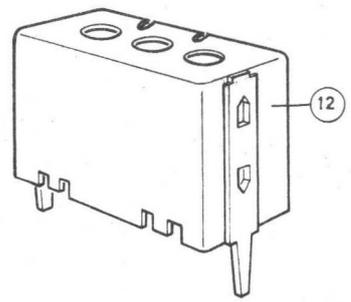
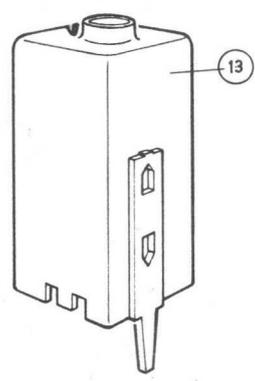
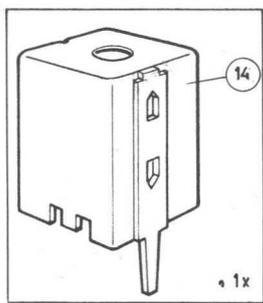
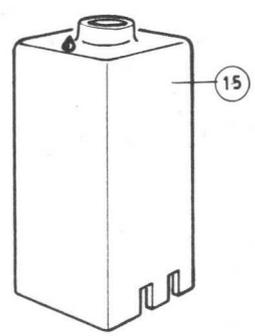
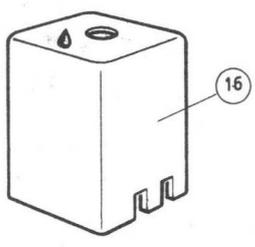
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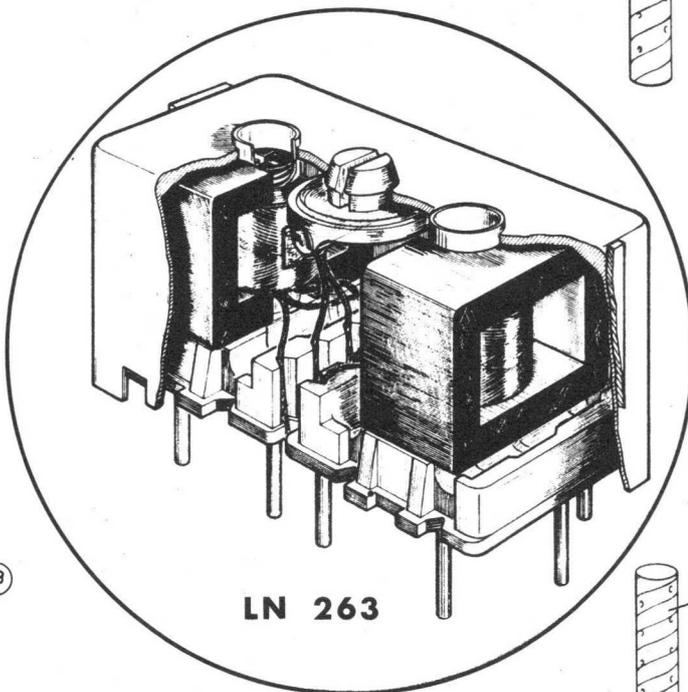
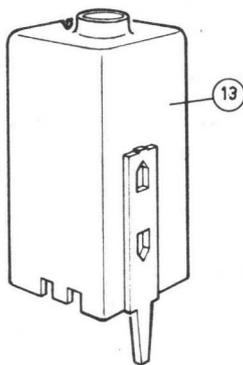
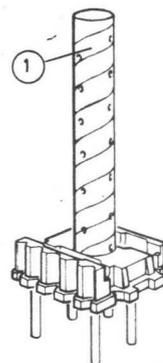
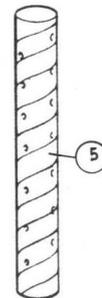
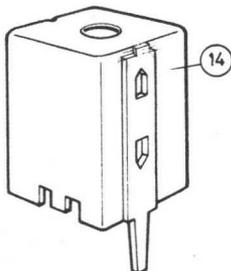
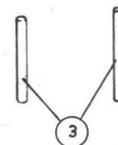
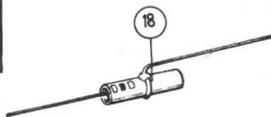
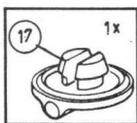
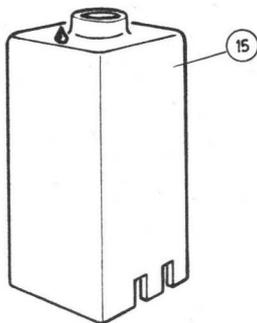
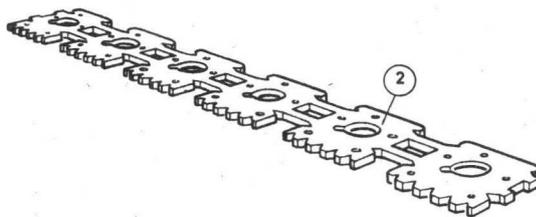
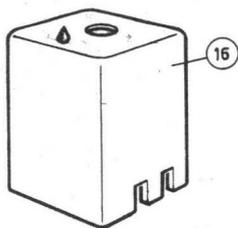
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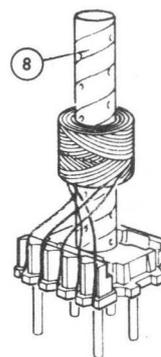
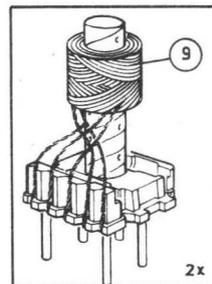
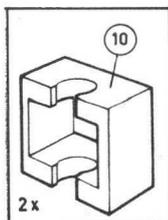
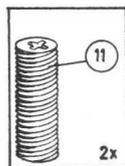
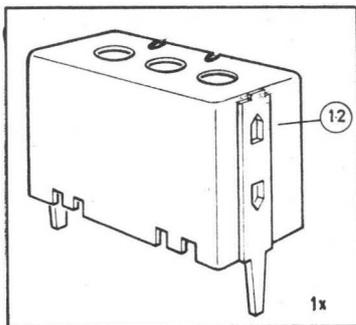
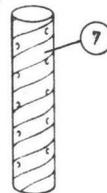
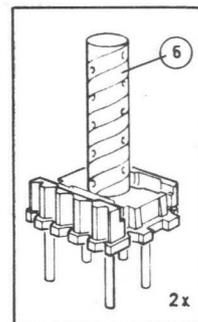


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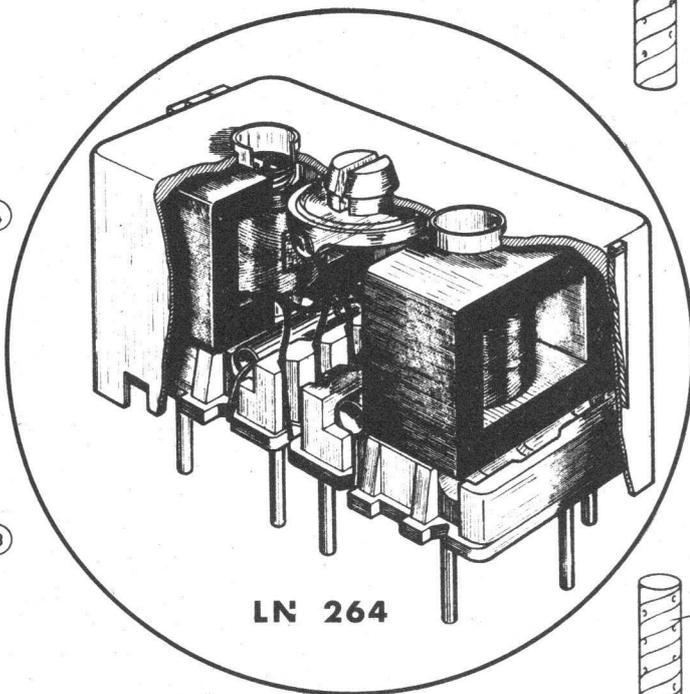
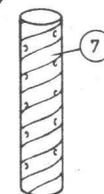
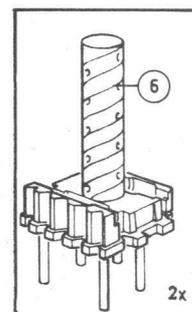
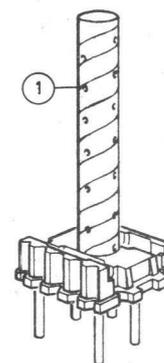
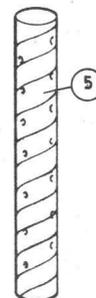
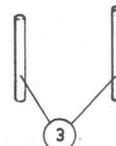
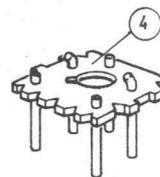
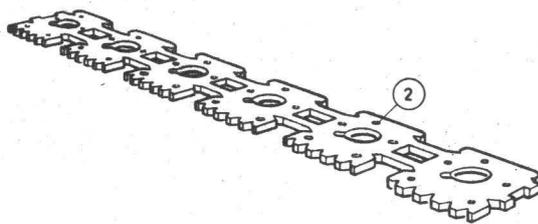
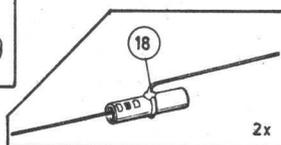
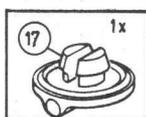
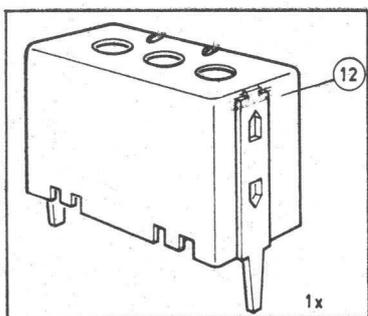
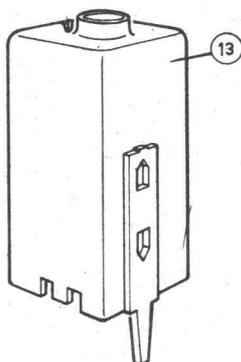
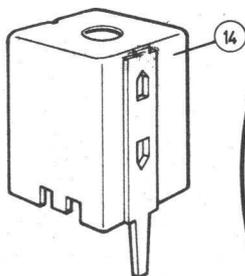
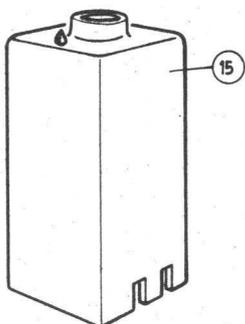
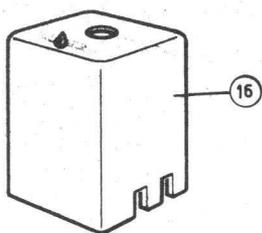


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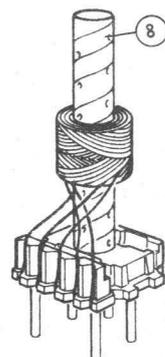
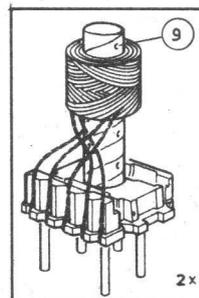
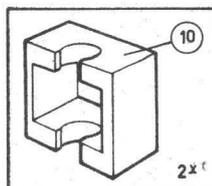
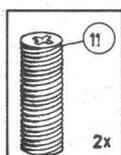
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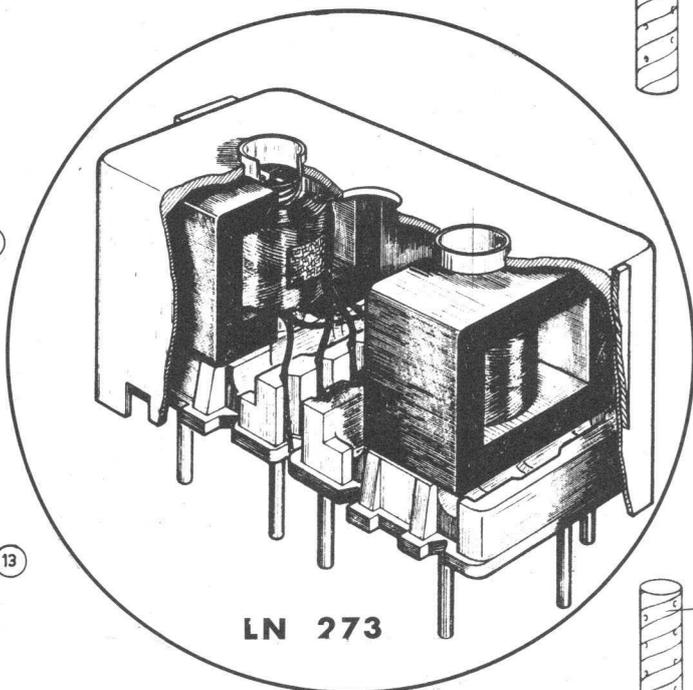
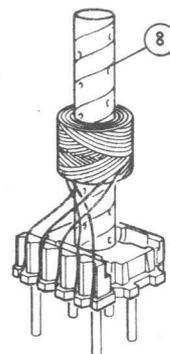
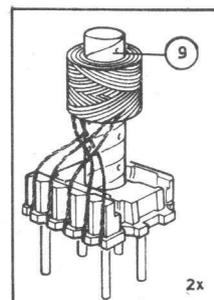
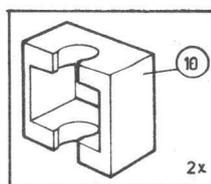
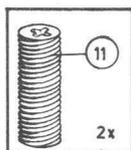
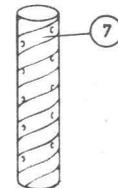
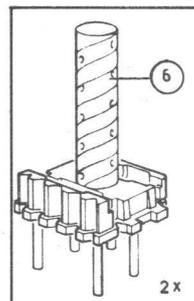
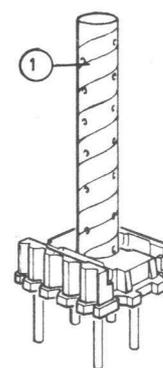
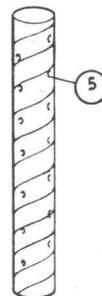
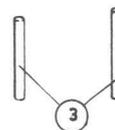
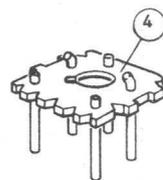
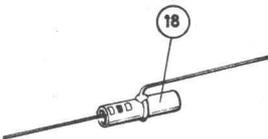
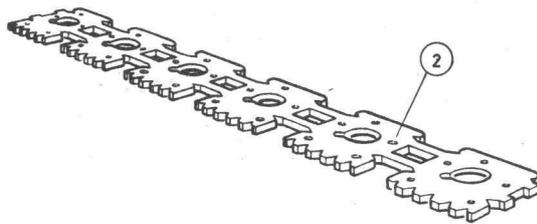
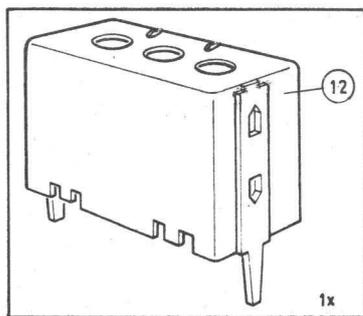
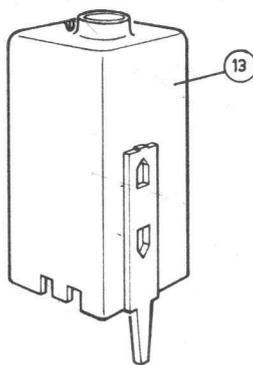
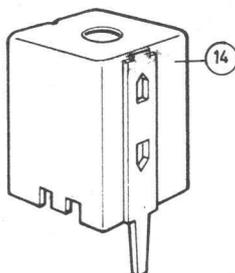
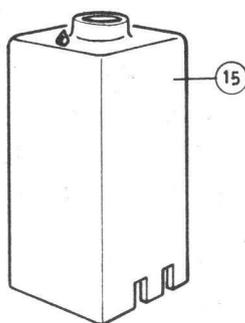
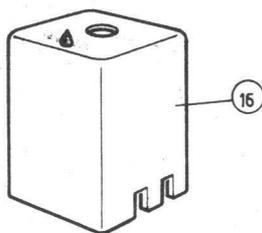


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FERROCEPTORS  
for application and manufacture in  
developing countries

AW3 - 9090  
sheet 1 of 2  
1st JUNE 1965

dimensions in mm

This document gives directions to be followed in the development of apparatus destined to be manufactured in developing countries. See for the entailing problematic, the procedure to be followed and a survey of the relevant standards AW3-9000.

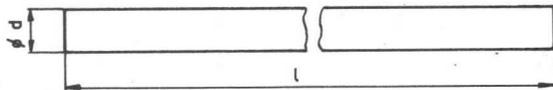
### 1. INTRODUCTION

In this document data regarding development, manufacture and application of ferroceptors have been established. Only the ferroceptors (material rod: 4B) mentioned in this standard are to be applied in apparatus destined to be manufactured in developing countries. With the aid of the standard parts (see AW3-9091) ferroceptors for M.W. application can be assembled. Further data are given in the following paragraphs:

dimensional sketch see para 2  
application data see para 3  
motivation of selection see para 4  
other standards see para 5

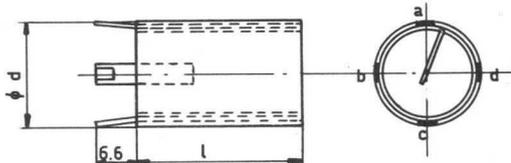
### 2. DIMENSIONAL SKETCH

#### .1 dimensions of aerial rod



diam.	length	code number
10 - 0.6	145 - 10	56 681 22/4B
	180 - 10	56 681 24/4B
	209 - 12	56 681 23/4B
	235 - 14	K5 970 85
6.5 - 0.3	130.5 - 1	K5 970 45

#### .2 dimensions of coil former



diam.	length	tags present on	code number
11	30	a, b, c, d	A3 782 13
		a, b, c	A3 814 58
7	29	-	A3 960 93

### 3. APPLICATION DATA

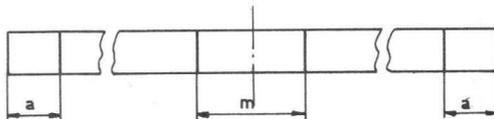
The designer of the apparatus has to indicate beside the normal electrical specification required:

- a. clamping method (see item 3.1)
- b. the number of coil formers (see item 3.2)

#### .1 Clamping method

Two clamping methods are possible:

- a) clamping at the ends of the aerial rod. The available room clamping construction (max. 2x10 mm) is indicated in the figure below by the letter a.
- b) clamping in the middle of the rod. The available room for clamping construction (max. 30 mm) is indicated by the letter m.



#### .2 Number of coil formers

Possibilities for M.W. application

- a) one coil former
- b) two coil formers with the coils in series.

### 4. WINDING DATA

#### .1 Winding wire

Stranded wire 16x0.04; code number R 364 KA/37 or  
stranded wire 24x0.04; code number R 364 KA/39

Use with: AW3-9000

Replaces NEW

N.V. PHILIPS' GLOEILAMPENFABRIEKEN EINDHOVEN-NEDERLAND  
PHILIPS INDUSTRIES

AW3 - 9090

sheet 1 of 2

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## 4.2 Winding method

Only the single layer winding method must be prescribed.

## .3 Winding direction

The coil must be wound in the left-hand direction.

.4 Length of lead-outs (only for  $\varnothing$  7 mm ferroceptors)

The length of the lead-outs must be equal; tolerance on the length  $\pm 2.5$  mm.  
The length of tinned ends must be 5+5 mm.

## .5 Fixing of winding wire

The winding wire must be fixed with tape acc. to AT-K 596.

## .6 Position of coil formers

A coil former with tags must be directed to the middle of the aerial rod.



## 5. MOTIVATION OF SELECTION

## .1 Comparison material 4B to material 3D3.

a) material 4B is the standard material in Eindhoven.

b) the specific resistivity of ferroxcube 4B is about  $10^5$  ohm/cm; the specific resistivity of material 4D3 amount to about 150 ohm/cm.

In order to avoid capacitance effects between coil and rod the material 4B (with respect to the high specific resistivity) is preferred. For the same reason the construction of coil formers for rods 4B can be cheaper and simpler than the coil formers for material 3D3.

## 6. OTHER STANDARDS

AW3-9091 - Piece parts for ferroceptors for manufacture and application in developing countries.



