NOTICE
OF VALIDATION

MIL-S-20708/39A
NOTICE 1
15 September 1987

MILITARY SPECIFICATION

SYNCHRO, CONTROL TRANSFORMER, TYPE 19CTB4B

MIL-S-20708/39A has been reviewed and determined to be valid for use in acquisition.

Custodians:
Navy-AS

Review Activities:
Air Force-99
DLA-ES

User Activities:

Preparing Activity:
Navy-AS

(Project 5990-0334-37)

AMSC - N/A

FSC 5990

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SUPERSEDING
MIL-S-20708/39(NORD)
31 March 1959

MILITARY SPECIFICATION

SYNCHRO, CONTROL TRANSFORMER, TYPE 19CTB4b

1. SCOPE

1.1 This specification covers the detail requirements for control transformer synchro, type 19CTB4b, 90 volt, 400 cycle.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, standards and drawings of the issue in effect on date of invitation for bids form a part of this specification.

SPECIFICATIONS

MILITARY

MIL-I-16557 - Ink, Marking, quick-drying (for non-porous surfaces).
MIL-S-20708 - Synchros, 60 and 400 cycles, General Specifications for.

DRAWINGS

BUREAU OF ORDNANCE

643019 - Clamp Assembly.
643090 - Washer, Drive.
644594 - Nut.
LD 255268 - Stock Material for Precision Instrument Components.
SA 2412503 - Gage, Spline.

(Copies of specifications, standards and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

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3. REQUIREMENTS

3.1 Qualification. - Except as specified in par. 3.1.1, synchros covered by this specification shall be a product which has been tested and qualified in accordance with Specification MIL-S-20708.

3.1.1 Preproduction sample. - Pending issuance of a Qualified Products List (Q.P.L.), a sample (see 4.1.1.1) of the synchros to be furnished under this specification shall be subjected to the preproduction tests as specified in Specification MIL-S-20708.

3.2 Requirements. - All requirements shall be in accordance with Specification MIL-S-20708 except as otherwise specified herein.

3.2.1 Salt spray requirement. - Not applicable.

3.2.2 Design and construction. - The synchro shall be of the design, construction and physical dimensions specified in Figure 1, and shall be complete, including all hardware shown and identified thereon.

3.2.3 Performance requirements. - The values applicable to the synchro shall be as specified in Table I.

Table I. - Synchro, Control Transformer, Type 19CTB4b

Requirement	Unit	Value
Frequency	Cycles	400
Primary voltage (nominal)	Volts	90
Primary current (maximum)	Milliamps	7.0
Primary power (maximum)	Watts	0.25
Transformation ratio ±2%		0.735
Electrical error (maximum)	Minutes	8.0
Null voltage total (maximum)	Millivolts	65
Fundamental component of null voltage (maximum)	Millivolts	35
Friction torque (maximum)	Ounce-inches	0.1
Phase shift	Degrees	3.0 (lead)
Primary impedance (Zp)	Ohms	1/
Secondary impedance (Zs)	Ohms	1/

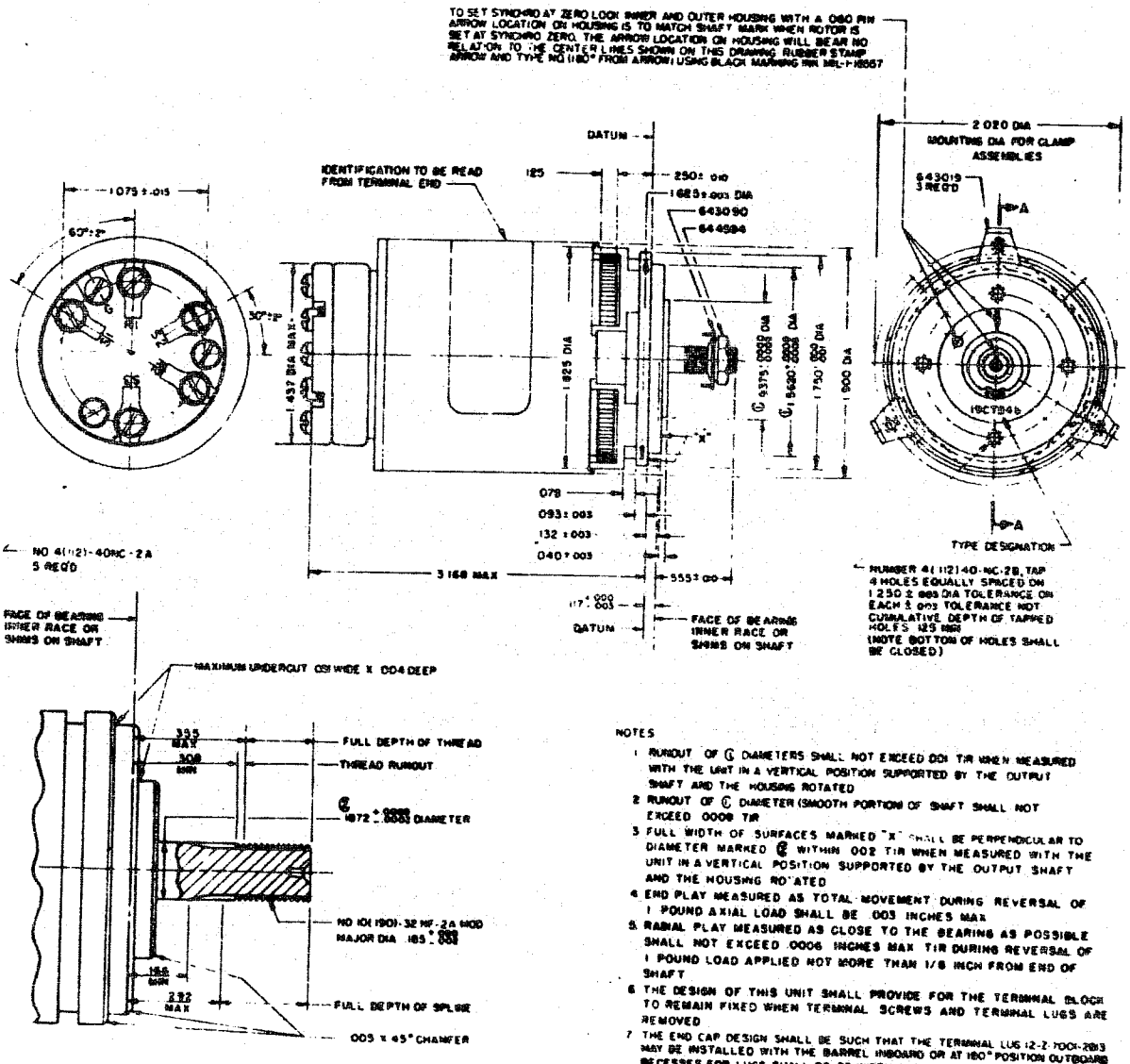
1/ As specified by BUORD (see 6.1)

SPLINE DATA	
TEETH	27
PITCH	20
PITCH DIAMETER	1.375 +.000 −.002
OUTSIDE DIAMETER	1.872 +.0000 −.0005
PRESSURE ANGLE	20°
ROOT DIAMETER MAX	.153
TOOTH FORM	FULL DEPTH INVOLUTE

NOTE THE END FUNCTION OF THIS SPLINE IS FOR POSITIVE ROTATIONAL FASTENINGS IT IS NOT TO BE USED AS A GEAR THIS SPLINE SHALL BE INSPECTED BY GO, NO GO SPLINE RING GAGE SA 241250-3

GEAR DATA	
TEETH	20
PITCH	72
PITCH DIAMETER	.6666 +.0001 −.0004
OUTSIDE DIAMETER	.6944 +.0003 −.0004
PRESSURE ANGLE	20°
ROOT DIAMETER MAX	.1628
TOOTH FORM	FULL DEPTH INVOLUTE

NOTE O.D. OF GEAR TO BE CONCENTRIC TO .5620 DIAMETER COLLAR WITHIN .003 SHAFT TO BE LOCKED TO OUTER HOUSING AND SHAFT MARK TO BE IN LINE WITH OUTER HOUSING ARROW



NOTES

1. RUNOUT OF Ⓒ DIAMETERS SHALL NOT EXCEED .001 TIR WHEN MEASURED WITH THE UNIT IN A VERTICAL POSITION SUPPORTED BY THE OUTPUT SHAFT AND THE HOUSING ROTATED
2. RUNOUT OF Ⓒ DIAMETER (SMOOTH PORTION OF SHAFT SHALL NOT EXCEED .0008 TIR
3. FULL WIDTH OF SURFACES MARKED "X" SHALL BE PERPENDICULAR TO DIAMETER MARKED Ⓒ WITHIN .002 TIR WHEN MEASURED WITH THE UNIT IN A VERTICAL POSITION SUPPORTED BY THE OUTPUT SHAFT AND THE HOUSING ROTATED
4. END PLAY MEASURED AS TOTAL MOVEMENT DURING REVERSAL OF 1 POUND AXIAL LOAD SHALL BE .003 INCHES MAX
5. RADIAL PLAY MEASURED AS CLOSE TO THE BEARING AS POSSIBLE SHALL NOT EXCEED .0006 INCHES MAX TIR DURING REVERSAL OF 1 POUND LOAD APPLIED NOT MORE THAN 1/8 INCH FROM END OF SHAFT
6. THE DESIGN OF THIS UNIT SHALL PROVIDE FOR THE TERMINAL BLOCK TO REMAIN FIXED WHEN TERMINAL SCREWS AND TERMINAL LUGS ARE REMOVED
7. THE END CAP DESIGN SHALL BE SUCH THAT THE TERMINAL LUG (2-2-700) (-2013 MAY BE INSTALLED WITH THE BARREL INBOARD OR AT 180° POSITION OUTBOARD RECESSES FOR LUGS SHALL BE OF WIDTH AND DEPTH TO PREVENT TURNING OF THE LUGS

PARTIAL SECTION A-A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± 1°

FIGURE 1 - SYNCHRO, CONTROL TRANSFORMER, TYPE 19CT84b

4. QUALITY ASSURANCE PROVISIONS AND TEST REQUIREMENTS

4.1 Sampling, inspection and tests. -

4.1.1 Sampling. - Except as specified in 4.1.1.1, sampling shall be in accordance with the requirements of Specification MIL-S-20708.

4.1.1.1 Preproduction samples. - Unless otherwise specified (see 4.1.1.1.1) and pending the issuance of a Q.P.L. (see 3.1.1), four (4) synchros shall be furnished by the contractor to the procuring activity for preproduction testing in accordance with Specification MIL-S-20708. Further productions of the item by the contractor prior to the approval of the procuring activity shall be at the contractor's risk. Accepted preproduction samples will become the property of the procuring activity and will be included in the quantity of synchros called for in the contract or order.

4.1.1.1.1 Preproduction sample for a subsequent contract. If a contractor has delivered synchros previously in accordance with the requirements of this specification and his product has been found to be satisfactory, the preproduction sample for any subsequent contract or order may be waived at the discretion of the procuring activity (see 6.1).

4.1.2 Inspection and tests. - Inspection and tests shall be conducted in accordance with the requirements of Specification MIL-S-20708 except as otherwise specified herein.

4.1.2.1 Salt spray test. -

4.1.2.2 Preproduction rejection criteria. - Failure of any preproduction sample synchro in any test or requirement shall be cause for withholding approval (see 4.1.1.1).

5. PREPARATION FOR DELIVERY

5.1 Preparation for delivery shall be in accordance with the requirements of Specification MIL-S-20708 except as otherwise specified herein.

5.2 Hardware. - All loose hardware (see 3.2.2) shall be packaged in a ventilated envelope made of material having a PH value of 6-8 that is compatible with the weight of the contents. The packaged hardware shall be placed in the unit synchro package.

6. NOTES

6.1 All notes specified in Specification MIL-S-20708 are applicable to this specification and in addition, under ordering data, should specify the following:

a. If preproduction samples are not required (see 4.1.1.1).

b. Impedance (see Table I).

6.2 Stock material. - Miscellaneous stock materials not shown on Figure 1 which may be required for use with synchros, should be selected from LD 255268.

Notice. - When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.