

MILITARY SPECIFICATION

SYNCHRO, DIFFERENTIAL RECEIVER, TYPE 23TDR6b

This specification has been approved by the Bureau of Naval Weapons, Department of the Navy.

1. SCOPE

1.1 This specification covers the detail requirements for differential receiver synchro type 23TDR6b, 90 volt, 60 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.

STANDARDS

MILITARY

MIL-STD-8

BUREAU OF NAVAL WEAPONS

NAVORD OSTD 600, Page 7-55.16.20 (INT) - 12-Z-7001-2813
Lug, Terminal

DRAWINGS

BUREAU OF NAVAL WEAPONS

- 1869563 - Clamp Assembly.
- 813820 - Washer, Drive.
- 854949 - Nut.
- LD 255268 - Stock Material for Precision Instrument Components.

(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.)

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 requirements. - 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.

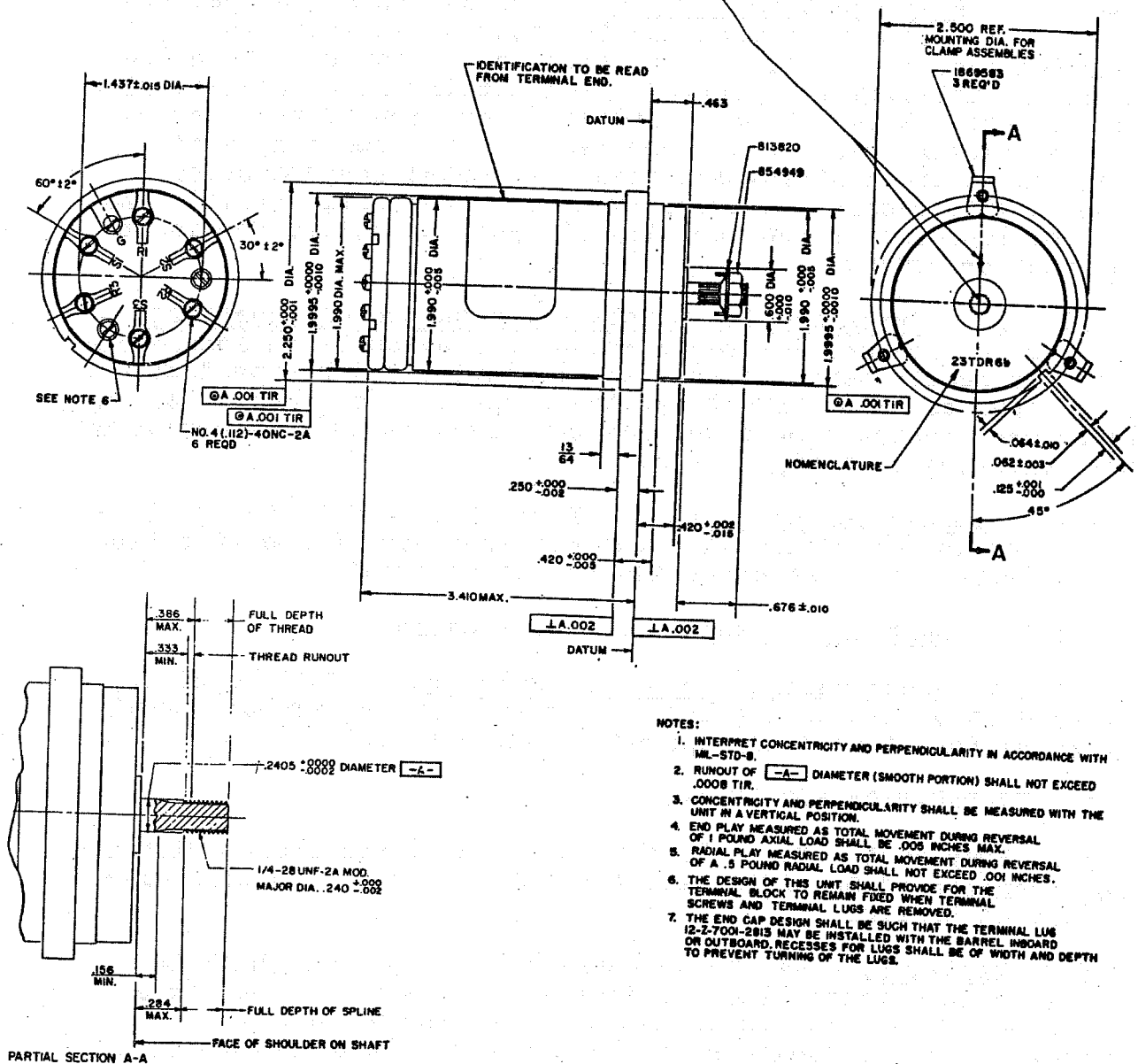
Table I. - Synchro, Differential Receiver, Type 23TDR6b

Requirement	Unit	Value
Frequency	Cycles	60
Primary voltage (nominal)	Volts	90
Primary current (maximum)	Milliamps	200
Primary power (maximum)	Watts	5
Transformation ratio $\pm 2\%$		1.154
Electrical error (maximum)	Minutes	6
Torque gradient (minimum)	Oz. in./Deg.	0.03
Receiver error (maximum)	Minutes	60
Synchronizing time $30^\circ \pm 2^\circ$	Seconds	1
(maximum) $177^\circ \pm 2^\circ$	Seconds	2
Phase shift (maximum)	Degrees	22 (lead)
Primary impedance (Z_p)	Ohms	$\frac{1}{1}$
Secondary impedance (Z_d)	Ohms	$\frac{1}{1}$

1/ As specified by Bureau of Naval Weapons (see 6.1).

INVOLUTE SPLINE DATA	
TEETH	22
PITCH	96
PITCH DIAMETER	229 ^{+0.0000} _{-0.0020}
OUTSIDE DIAMETER	2405 ^{+0.0000} _{-0.0020}
PRESSURE ANGLE	20°
ROOT DIAMETER MAX.	205
TOOTH FORM	FULL DEPTH INVOLUTE

NOTE: INVOLUTE SPLINE BASED ON 250 NOMINAL SHAFT DIAMETER WITH REDUCED ADDENDUM. THE END FUNCTION OF THIS SPLINE IS FOR POSITIVE ROTATIONAL FASTENINGS. IT IS NOT TO BE USED AS A GEAR.



- NOTES:
1. INTERPRET CONCENTRICITY AND PERPENDICULARITY IN ACCORDANCE WITH MIL-STD-8.
 2. RUNOUT OF ---A DIAMETER (SMOOTH PORTION) SHALL NOT EXCEED .0008 TIR.
 3. CONCENTRICITY AND PERPENDICULARITY SHALL BE MEASURED WITH THE UNIT IN A VERTICAL POSITION.
 4. END PLAY MEASURED AS TOTAL MOVEMENT DURING REVERSAL OF 1 POUND AXIAL LOAD SHALL BE .008 INCHES MAX.
 5. RADIAL PLAY MEASURED AS TOTAL MOVEMENT DURING REVERSAL OF A .5 POUND RADIAL LOAD SHALL NOT EXCEED .001 INCHES.
 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 GAP DESIGN SHALL BE SUCH THAT THE TERMINAL LUG 12-77001-2B15 MAY BE INSTALLED WITH THE BARREL INBOARD OR OUTBOARD. RECESSES FOR LUGS SHALL BE OF WIDTH AND DEPTH TO PREVENT TURNING OF THE LUGS.

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS & DECIMALS ±.005 ANGLES ± 1'

FIGURE 1-SYNCHRO, DIFFERENTIAL RECEIVER, TYPE 23TDR6b

4. QUALITY ASSURANCE PROVISIONS

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 production 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. - Not applicable.

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 the rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

