

MIL-S-20708/53D
30 July 1987

SUPERSEDING
MIL-S-20708/53C
19 December 1968

MILITARY SPECIFICATION SHEET
SYNCHRO, CONTROL TRANSFORMER, TYPE 23CT6D

This specification is approved for use by all Departments and Agencies of the Department of Defense. The requirements for acquiring the Synchros described herein shall consist of this specification and the latest issue of MIL-S-20708.

TABLE I. Requirements.

Requirement	Value	Unit	Tolerance
Frequency	60	Hz	±1%
Primary Voltage	90	volts	±1%
Primary Current	18.5	milliamps	maximum
Primary Power	0.48	watts	maximum
Impedance:			
Z _{so}	4200-5100	ohms	min.-max.
Z _{rs}	1350-1650	ohms	min.-max.
Impedance Angle:			
Z _{so}	70.0-76.0	degrees	min.-max.
Z _{rs}	14.0-20.0	degrees	min.-max.
Transformation Ratio	0.735	-----	±2%
Phase Shift (Lead)	14	degrees	±2.5
Electrical Error	6.0	minutes	maximum
Null Voltage:			
Total	45	millivolts	maximum
Fundamental	30	millivolts	maximum
Friction Torque	0.2	ounce-inches	maximum
Radial Play	0.0010	inches	maximum
End Play	0.0025	inches	±0.0020
Temperature Rise	10	degrees (C)	maximum

MIL-S-20708/53D

TABLE II. Military part number variant characteristics.

Military Part No. 1/	A ±.010	B ±.010	G Maximum	Shaft Style	Terminal End	U +.0000 -.0005
M20708/53-01D	.676	.719	3.160	Splined	Terminal Board	.2405

1/Military part number M20708/53-01D shall be the NATO standard.

1/The suffix letter following the numerical dash number corresponds to the latest modification letter in the type designation.

TABLE III. Military part number cross-references.

SUPERSEDED MILITARY PART NUMBERS		NEW MILITARY PART NUMBERS
MIL-S-20708/53C	MIL-S-20708/53B	
M20708/53C-001	M20708/53-001	M20708/53-01D

NOTE: All line items shown in Table III refer to equivalent and interchangeable synchros of the same type designation modification. Part number changes do not affect form, fit, or function of the synchros listed therein.

Custodians:

Army-AR
Navy-AS
Air Force-85

Preparing Activity:

Navy-AS

(Project 5990-0334-49)

Review Activities:

Army-MI,AV
Navy-OS
Air Force-11,17,99
DLA-ES

User Activities:

Navy-MC,CG

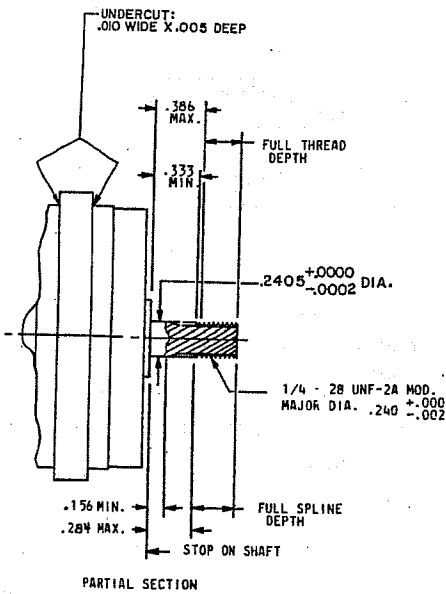
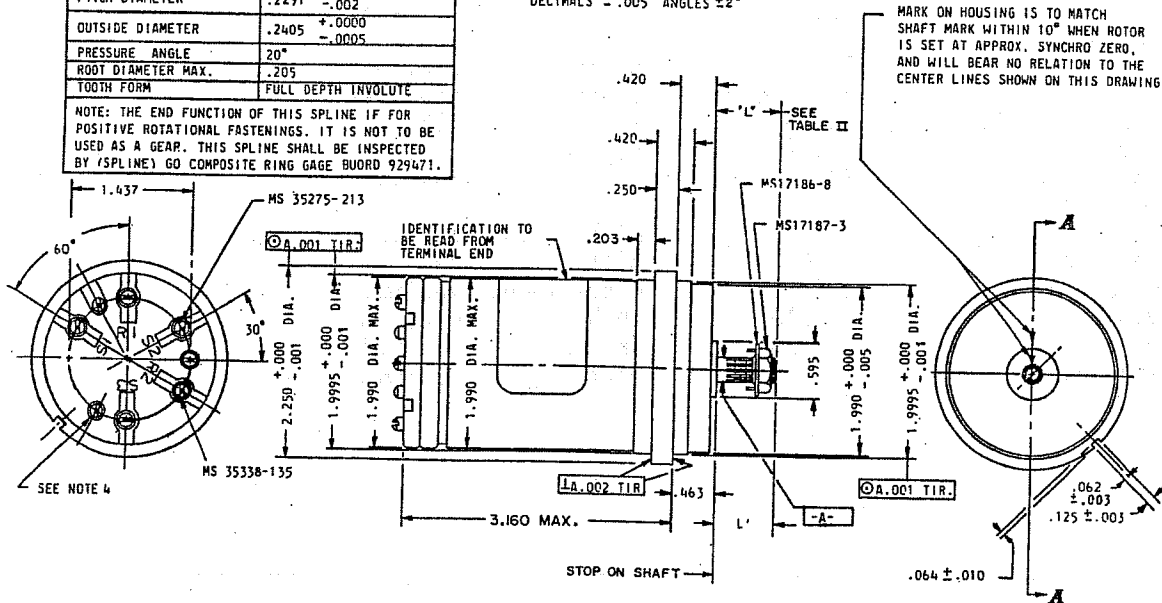
MILITARY SPECIFICATION SHEET
 SYNCHRO CONTROL TRANSFORMER, TYPE 23CT6D

This Specification is Mandatory for Use by all Departments and Agencies of the Department of Defense.
 THE COMPLETE REQUIREMENTS FOR PROCURING THE SYNCHRO DESCRIBED HEREIN
 SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF MIL-S-20708

SPLINE DATA	
TEETH	22
PITCH	.96
PITCH DIAMETER	.2291 $\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$
OUTSIDE DIAMETER	.2405 $\begin{smallmatrix} +.0000 \\ -.0005 \end{smallmatrix}$
PRESSURE ANGLE	20°
ROOT DIAMETER MAX.	.205
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 (SPLINE) GO COMPOSITE RING GAGE BUORD 929471.

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON FRACTIONS $\pm 1/64$
 DECIMALS $\pm .005$ ANGLES $\pm 2^\circ$



NOTES:

- PERPENDICULARITY AND CONCENTRICITY SHALL BE MEASURED WITH THE UNIT IN A VERTICAL POSITION SUPPORTED BY THE SHAFT, THEN THE HOUSING ROTATED.
- RUNOUT OF FEATURE "A" (SMOOTH PORTION) OF SHAFT SHALL NOT EXCEED .0008 TIR.
- END PLAY AND RADIAL PLAY SHALL BE MEASURED DURING THE REVERSAL OF THE FOLLOWING LOADS:
 END PLAY - 1 POUND
 RADIAL PLAY - 1/2 POUND
- THE TERMINAL BLOCK SHALL BE SECURED BY SCREWS OTHER THAN THE TERMINAL SCREWS. RECESSES SHALL ALLOW TERMINAL LUGS MS-17182-1 TO BE INSTALLED WITH THE BARRELS INBOARD OR OUTBOARD, AND PREVENT THE LUGS FROM TURNING.
- MINOR VARIATIONS OF UNIT CONFIGURATION ARE PERMITTED FOR UNDIMENSIONED DESIGN DETAIL.
- THE FOLLOWING LIST OF HARDWARE, MS-35275-213 MACHINE SCREW (5 REQUIRED), MS-35338-135 LOCK WASHER (5 REQUIRED), MS-17186-6 DRIVE WASHER (1 REQUIRED), MS-17187-3 NUT (1 REQUIRED), SHALL BE PACKAGED IN A VENTILATED ENVELOPE MADE OF MATERIAL HAVING A PW VALUE OF 6-8 THAT IS COMPATIBLE WITH THE WEIGHT OF THE CONTENTS, THEN THE PACKAGED HARDWARE SHALL BE PLACED IN THE UNIT SYNCHRO PACKAGE. FOR INFORMATION ONLY, SEE SYNCHRO CLAMP MS-17183.
- PENDING ISSUANCE OF A QUALIFIED PRODUCTS LIST (QPL) A SAMPLE OF THE SYNCHROS TO BE FURNISHED UNDER THIS SPECIFICATION SHALL BE SUBJECT TO THE PREPRODUCTION TESTS AS SPECIFIED IN MIL-S-20708.

TABLE I

Requirement	Value	Unit	Tolerance
Frequency	60	Hz	+1%
Primary Voltage	90	volts	nominal
Primary Current	18.5	milliamps	maximum
Primary Power	0.40	watts	nominal
Impedance:			
Z _{so}	4200-5100	ohms	min.-max.
Z _{rs}	1350-1650	ohms	min.-max.
Impedance Angle:			
Z _{so}	70.0-76.0	degrees	min.-max.
Z _{rs}	14.0-20.0	degrees	min.-max.
Transformation Ratio	0.735	-----	+2%
Phase Shift	14.0(lead)	degrees	±2.5
Electrical Error	6.0	minutes	maximum
Null Voltage:			
Total	45.0	millivolts	maximum
Fundamental	30.0	millivolts	maximum
Friction Torque	0.2	ounce-inches	maximum
Radial Play	0.0010	inches	maximum
End Play	0.0025	inches	+0.0020
Temperature Rise	10.0	degrees(C)	maximum

Part number: M20708/53C plus applicable dash number from Table II.

TABLE II

DASH NO.	SHAFT DIAMETER	SHAFT STYLE	TERMINAL END	L' DIMENSION TO STOP ON SHAFT	L REFERENCE FREE SHAFT LENGTH
*-001	.2405	Splined	Terminal Board	.676 ± .010	.719 ± .010

*Dash number -001 shall be the NATO standard.

Custodians: Army-MU Navy-AS Air Force-85	Review Activities: Army-EL,MI,MO,AV,MU Navy-SH,OS,AS Air Force-11,17.85 DSA-ES	User Activities: Navy-SH,OS,AS,MC,CG	Preparing Activity: Navy-AS Project No. 5990-0079
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MILITARY SPECIFICATION SHEET

SYNCHRO, CONTROL TRANSFORMER, TYPE 23CT6D

This amendment forms a part of Military Specification Sheet MIL-S-20708/53C dated 19 December 1968, and is approved for use by all Departments and Agencies of the Department of Defense.

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Table II and notes above and below Table II - Delete entirely and substitute the following:

"TABLE II. Military Part Number Variant Characteristics

MILITARY PART NO. <u>1/</u>	SHAFT DIAMETER NOMINAL	SHAFT STYLE	TERMINATION	L' DIMENSION TO STOP ON SHAFT	L DIMENSION FREE SHAFT LENGTH
M20708/53-01D	.2405	Splined	Terminal Board	.676 \pm .010	.719 \pm .010

1/ Military part number M20708/53-01D shall be the NATO Standard.

1/ The suffix letter following the numerical dash number corresponds to the latest modification letter in the type designation."

FSC 5990

MIL-S-20708/53C
AMENDMENT 1

Add a new Table III and note as follows:

"TABLE III. Military Part Number Cross-References

SUPERSEDED MILITARY PART NUMBERS		NEW MILITARY PART NUMBERS
MIL-S-20708/53C	MIL-S- 20708 /53B	
M20708/53C-001	M20708/53-001	M20708/53-01D

NOTE: All line items shown in Table III refer to equivalent and interchangeable synchros of the same type designation modification. Part number changes do not affect form, fit, or function of the synchros listed therein."

Custodians:

Army - AR
Navy - AS
Air Force - 85

Preparing activity:

Navy - AS
Project No. 5990-0313-34

Review activities:

Army - ME
Navy - OS, SH, EC
Air Force - 11, 17, 19, 99
DSA - ES

User activities:

Army -
Navy - MC, CG
Air Force -

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
INSTRUCTIONS		
This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).		
SPECIFICATION MIL-S-20708/53C		
ORGANIZATION (of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?		
A. GIVE PARAGRAPH NUMBER AND WORDING.		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE?		
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE

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Naval Air Engineering Center
Philadelphia, Pennsylvania 19112

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