

MILITARY SPECIFICATION SHEET

SYNCHRO, CONTROL DIFFERENTIAL TRANSMITTER, TYPE 11CDX4B

This amendment forms a part of Military Specification Sheet MIL-S-20708/81C dated 19 December 1968, and is approved for use by all Departments and Agencies of the Department of Defense.

PAGE 2

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 |
|-----------------------------|------------------------|-----------------|----------------|-------------------------------|-------------------------------|
| M20708/81-01B | .1872 | Splined | Terminal Board | .555 ± .010 | .500 ± .010 |
| M20708/81-02B | .1200 | Plain & Slotted | Wire Leads | .368 | .312 |
| M20708/81-03B | ↓ | | | .430 | .375 |
| M20708/81-04B | ↓ | | | .493 | .437 |
| M20708/81-05B | ↓ | | | .555 | .500 |
| M20708/81-06B | ↓ | | | .618 | .562 |

1/ Military part number M20708/81-01B 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-20708/81C
 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| SUPERSEDED MILITARY PART NUMBERS | | NEW MILITARY PART NUMBERS |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-20708/81C | MIL-S-20708/81B | |
| M20708/81C-001 | M20708/81-001 | M20708/81-01B |
| M20708/81C-002 | | M20708/81-02B |
| M20708/81C-003 | | M20708/81-03B |
| M20708/81C-004 | | M20708/81-04B |
| M20708/81C-005 | | M20708/81-05B |
| M20708/81C-006 | | M20708/81-06B |

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. 5990-0313-43

Review activities:

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

User activities:

Army -
 Navy - MC, CG
 Air Force -

MIL-S-20708/81D
30 July 1987

SUPERSEDING
MIL-S-20708/81C
19 December 1968

MILITARY SPECIFICATION SHEET
SYNCHRO, CONTROL DIFFERENTIAL TRANSMITTER, TYPE 11CDX4B

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 | 400 | Hz | ±1% |
| Primary Voltage | 90 | volts | ±1% |
| Primary Current | 49 | milliamps | maximum |
| Primary Power | 0.63 | watts | maximum |
| Impedance: | | | |
| Z _{so} | 1590-2050 | ohms | min.-max. |
| Z _{rs} | 470-570 | ohms | min.-max. |
| Impedance Angle: | | | |
| Z _{so} | 79.0-85.0 | degrees | min.-max. |
| Z _{rs} | 23.0-33.0 | degrees | min.-max. |
| Transformation Ratio | 1.154 | ----- | ±2% |
| Phase Shift (Lead) | 4.0 | degrees | ±2.0 |
| Electrical Error | 7.0 | minutes | maximum |
| Null Voltage: | | | |
| Total | 90 | millivolts | maximum |
| Fundamental | 60 | millivolts | maximum |
| Friction Torque | 0.07 | ounce-inches | maximum |
| Radial Play | 0.0006 | inches | maximum |
| End Play | 0.0010 | inches | ±0.0005 |
| Temperature Rise | 20 | degrees (C) | maximum |

MIL-S-20708/81D

TABLE II. Military part number variant characteristics.

| Military Part No. 1/ | A ±.010 | B ±.010 | G Maximum | Shaft Style | Terminal End | U +.0000 |
|----------------------|------------|------------|--------------|----------------------------|------------------------------|-------------|
| M20708/81-01B | .555 | .500 | 1.789 | Splined Plain & Slotted | Terminal Board Wire Leads | .1872 |
| M20708/81-02B | .368 | .312 | 1.687 | | | .1200 |
| M20708/81-03B | .430 | .375 | ↓ | ↓ | ↓ | ↓ |
| M20708/81-04B | .493 | .437 | | | | |
| M20708/81-05B | .555 | .500 | | | | |
| M20708/81-06B | .618 | .562 | | | | |

1/Military part number M20708/81-01B 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-20708/81C | MIL-S-20708/81B | |
| M20708/81C-001 M20708/81C-002 M20708/81C-003 M20708/81C-004 M20708/81C-005 M20708/81C-006 | M20708/81-001 | M20708/81-01B M20708/81-02B M20708/81-03B M20708/81-04B M20708/81-05B M20708/81-06B |

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 5990-0334-64)

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

User Activities:
Navy-MC,CG

MILITARY SPECIFICATION SHEET
 SYNCHRO CONTROL DIFFERENTIAL TRANSMITTER, TYPE 11CDX4b

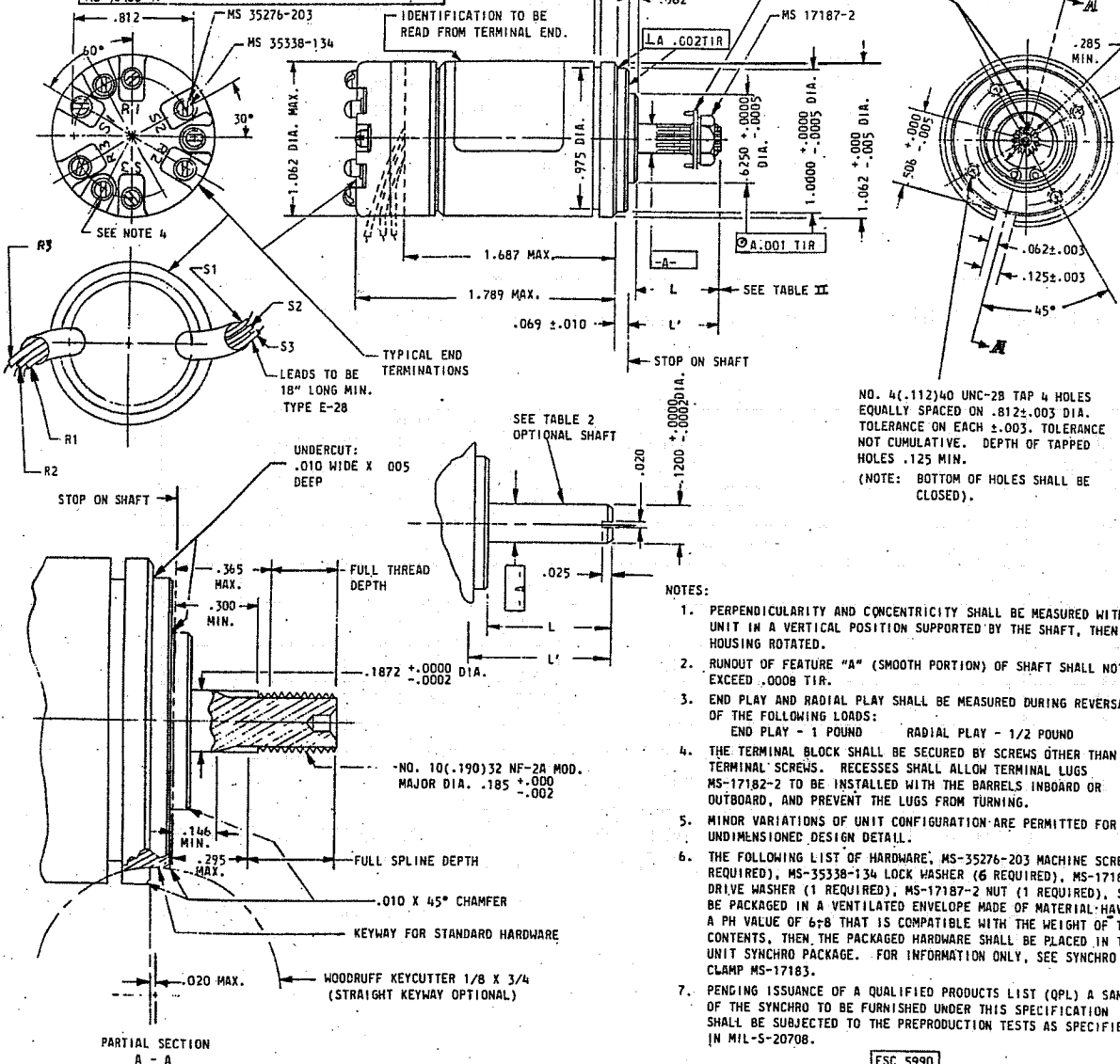
This Specification is Mandatory for Use by all Departments and Agencies of the Department of Defense.
 THE COMPLETE REQUIREMENTS FOR PROCURING THE SYNCHRO DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN-EFFECT OF MIL-S-20708.

| SPLINE DATA | |
|--------------------|---------------------|
| TEETH | 21 |
| PITCH | 120 |
| PITCH DIAMETER | .175 \pm .000 |
| OUTSIDE DIAMETER | .1872 \pm .0000 |
| PRESSURE ANGLE | 20° |
| ROOT DIAMETER MAX. | .155 |
| 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 MS-90406-1.

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

MARK ON HOUSING IS TO MATCH SHAFT MARK WITHIN 10° WHEN ROTOR IS SET AT APPROXIMATE SYNCHRO ZERO, AND WILL BEAR NO RELATION TO THE CENTER LINES SHOWN ON THIS DRAWING.



FSC 5990

TABLE I

| Requirement | Value | Unit | Tolerance |
|----------------------|-----------|--------------|-----------|
| Frequency | 400 | Hz | +1% |
| Primary Voltage | 90 | volts | nominal |
| Primary Current | 49.0 | milliamps | maximum |
| Primary Power | 0.53 | watts | nominal |
| Impedance: | | | |
| Z _{so} | 1590-2050 | ohms | min.-max. |
| Z _{rs} | 470-570 | ohms | min.-max. |
| Impedance Angle: | | | |
| Z _{so} | 79.0-85.0 | degrees | min.-max. |
| Z _{rs} | 23.0-33.0 | degrees | min.-max. |
| Transformation Ratio | 1.154 | ----- | +2% |
| Phase Shift | 4.0(lead) | degrees | +2.0 |
| Electrical Error | 7.0 | minutes | maximum |
| Null Voltage: | | | |
| Total | 90.0 | millivolts | maximum |
| Fundamental | 60.0 | millivolts | maximum |
| Friction Torque | 0.07 | ounce-inches | maximum |
| Radial Play | 0.0006 | inches | maximum |
| End Play | 0.0010 | inches | +0.0005 |
| Temperature Rise | 20.0 | degrees(C) | maximum |

Part number: M20708/81C 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 LENGHT |
|----------|----------------|-----------------|----------------|-------------------------------|-------------------------------|
| *001 | .1872 | Splined | Terminal Board | .555±.010 | .500 ± .010 |
| 002 | .120 | Plain & Slotted | 18" Wire Leads | .368 | .312 |
| 003 | | | | .430 | .375 |
| 004 | | | | .493 | .437 |
| 005 | | | | .555 | .500 |
| 006 | ↓ | ↓ | ↓ | .618 | .562 |

*Dash number -001 shall be the NATO Standard, any subsequent dash number illustrated on Table II shall be permitted.

| | | | |
|--------------------|---------------------------|-------------------------|-----------------------------|
| Custodians: | Review Activities: | User Activities: | Preparing Activities |
| Army-MU | Army-EL,MI,MO,AV,MU | Navy-SH,OS,AS,MC,CG | Navy-AS |
| Navy-AS | Navy-SH,OS,AS | | |
| Air Force-85 | Air Force-11,17,85 | | Project No. 5990-0071 |
| | DSA-ES | | |

| SPECIFICATION ANALYSIS SHEET | | Form Approved Budget Bureau No. 119-R004 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------------|
| INSTRUCTIONS | | |
| <p>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).</p> | | |
| SPECIFICATION | | |
| MTL-S-20708/81C | | |
| 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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