

## STATEMENT OF WORK

### M249 SQUAD AUTOMATIC WEAPON (SAW)

#### BIPOD, HANDGUARD/HEATSHIELD, HANGER RAIL IMPROVEMENTS

1.0 SCOPE: The M249 SAW shall incorporate attachment rails in the area of the current handguard as part of a Government Engineering Study. This action is in response to a demand to attach accessory and training equipment to the weapon to enhance target acquisition of the soldier. Currently, engineering studies are being conducted to improve the handguard/heatshield, to design prototype rails, in accordance with Mil-STD-1913 rails and attachment mechanisms, and to improve the bipod. The contractor shall examine the compatibility between the handguard/heatshield, ARDEC designed rails, and bipod. If necessary, the contractor shall modify the design of the handguard/heatshield and the bipod in order to ensure compatibility among all components. The contractor shall deliver 100 each of the items specified below, manufactured to the modified design along with all technical data.

2.0 GOVERNMENT DRAWINGS:

2.1 OTHER GOVERNMENT DOCUMENTS:

MIL-STD-1913      Dimensioning of Accessory Mounting Rail for Small      3 February 1995  
Arms Weapons

Drawing Number 12993771 Rail Accessory Assembly

3.0 REQUIREMENTS:

3.1 The contractor shall modify the design of the handguard/heatshield or the bipod in order to ensure compatibility among all components.

3.2 In the process of redesigning the handguard/heatshield and/or the bipod, the contractor shall ensure the following:

3.2.1 The handguard shall be firmly attached to the rails through all operational and firing scenarios.

3.2.1.1 The handguard on the rails shall not cause the barrel to overheat beyond current cook-off limits (210 rounds), during normal firing of 85 shots per minute (spm).

3.2.1.2 The handguard/heatshield material shall not change, deform, crack, or melt as a result of the normal or sustained firing sequence(s) of the M249, as defined in paragraph 3.4.2 below.

3.2.1.3 The temperature transmitted through the rails, to either the handguard/heatshield cover or any attached device, shall not exceed 120 degrees (when measured on the surface of the device or the handguard).

3.2.1.4 The handguard/heatshield shall have the ability to be removed to expose the rails so that accessory equipment can be mounted to the rails. If bottom rail is used, a forward grip must be available for stabilizing the weapon.

3.2.2 The rails shall be manufactured in accordance with MIL-STD-1913.

3.2.3 The contractor shall ensure that the bipod is compatible with the attachment rails and the redesigned handguard/heatshield, and can be stowed when not in use.

3.2.4 The contractor shall ensure that the modified hardware (rails, handguard and bipod) does not interfere in any way with the attachment points for any mounts that are used with the M249 either in testing or in operation.

3.2.5 The contractor shall manufacture 100 of each Front End Assemblies, consisting of bipods, handguard/heatshield, and rail assemblies, Drawing Number 12993771 (which shall be supplied as Government Furnished Material (GFM)).

3.3 TECHNICAL DATA PACKAGE: The contractor shall provide the government with Level III fully competitive TDP depicting the redesigned bipod, handguard/heatshield, and attachment rails. The delivered TDP shall be with unlimited rights IAW DFARS 252.227-7013, and its delivery shall constitute relinquishment of any implied proprietary rights by the contractor.

3.4 TESTING: Three each of rails, handguard/heatshields, and bipods shall be utilized for testing.

3.4.1 HEAT TEST

3.4.1.1 The weapon shall be tested in the "handguard" configuration (without laser-pointing devices) and fired from the shoulder while utilizing the bipod.

3.4.2.1.1 The firing schedule shall be as follows:

3.4.2.1.2 Schedule 1: Fire 200 rounds at 200 shots per minute followed immediately (without either cooling or removal) by firing 800 rounds at 100 shots per minute. (Burst length shall be 5-7 rounds per burst)

3.4.2.1.3 Schedule 2: Fire 1000 rounds at 85 shots per minute on a single barrel without changing the barrel and without cooling throughout the test.

3.4.2.1.4 Schedule 3: Fire two barrels (each fitted with its own dedicated handguard/heatshield) as follows:

Barrel 1: Fire 200 rounds at 85 shots per minute, remove and replace the barrel with the second barrel.

Barrel 2: Fire 200 rounds at 85 shots per minute, remove and replace with barrel 1. (Do not cool barrels between cycles) After 400 rounds have been fired from each barrel, cool either to room temperature or to the point of safe handling. Continue until 1600 rounds have been fired from each barrel.

3.4.2.1.5 Schedule 4: Fire two barrels (each fitted with its own dedicated handguard/heatshield) as follows:

Barrel 1: Fire 200 rounds at 85 shots per minute in bursts of 5-7 rounds, remove and replace with barrel 2.

Barrel 2: Fire 200 rounds at 85 shots per minute in bursts of 5-7 rounds, remove and replace with barrel 1. (Do not cool barrels between cycles) Repeat cycle until 1600 rounds has been fired from each barrel.

3.4.2.2 The condition of the handguard/heatshield shall be noted, recorded, and photographed at the conclusion of each test segment and/or at the point where any melting or deformation is observed.

3.4.2.3 The temperature shall be measured and recorded throughout the testing at the surface (that area that will come in contact with the operator's hand) of the handguard and heatshield at three separate locations, and at the surface of the points of contact with the rail and/or receiver and/or barrel.

3.4.2.4 The weapon shall be tested with the laser pointing device attached as follows:

3.4.2.4.1 Fire schedules 1 and 2 above.

3.4.2.4.2 The temperature shall be measured and recorded throughout the testing at the surface of the pointing device and at the point of contact between the rail and the attachment point of the device.

### 3.4.3 BIPOD STABILITY TEST

3.4.3.1 The contractor shall propose testing which will measure the structural limits of the bipod components that will be modified under this effort. Testing shall be equivalent to testing proposed during on going Bipod Stability Engineering Study Contract.

3.4.3.2. The contractor shall determine the structural limits of original components and assemblies and modified components and assemblies to demonstrate an improvement in accordance with test parameters and approved by Government technical representative.

### 3.5 DELIVERY SCHEDULE

Approval of Design Concepts	3 months after award of contract
Delivery of Preliminary Drawings	5 months after award of contract
Approval of Test Contractor Test Plan	6 months after award of contract
Production of Prototype Hardware	8 months after award of contract
Testing of Prototype Hardware Completed	10 months after award of contract
Delivery of Final TDP	12 months after award of contract

### 3.6 GOVERNMENT FURNISHED MATERIAL

3 M249 Machine Guns

6 M249 Barrel Assemblies

100 Rail Assemblies, Drawing Number 12993771

2 AN/PAQ-4 Laser Pointing Devices

1 Laser Borelight

10,000 Rounds 100% M855 Ball Ammunition

50,000 Rounds M855/M856 Ammunition packed out in 4:1 Ball:Tracer Configuration

XA. Safety and Health. The bipod, handguard/heatshield, hanger rail improvements shall not present a **High or Medium Risk Level** to personnel or equipment.

XB. Safety. When required (see XF) a Safety Risk Assessment shall be provided by the contractor. The Safety Risk Assessment shall be reviewed by the Government.

XC. Environmental. The contractor shall comply with the requirements of the Clean Air Act (42 U.S.C. 7414) and section 308 of the Clean Water Act (33 U.S.C. 1318). The contractor shall identify all hazardous materials used and provide material safety data sheets IAW 29 CFR 1910.1200(g).

XD. Definitions.

XE. High or Medium Risk Level. Hazard severity and probability categories resulting in a high or medium risk levels. High-risk levels include hazard severity/probability levels IA - ID, IIA - IIC & IIIA. Medium risk levels include hazard severity/probability levels IE, IID, IIIB, IIIC & IVA. (Reference MIL-STD-882 C, System Safety Program Requirements).

XF. Safety Risk Assessment. The safety risk assessment shall identify all safety features of the system, design, and procedural hazards that may be present in the system being acquired, and it shall also identify specific procedural controls and precautions that should be followed. The safety risk assessment shall: (a) list all hazards by subsystem or major components that have been identified, (b) discuss all actions that have been taken to eliminate or control the hazards identified, (c) discuss the effects of the controls on the probability of occurrence and severity level of the potential event, and (d) discuss any residual risks that remain after the controls are applied or for which no controls have been applied. Safety precautions and procedures necessary during use, storage, transportation, and disposal shall be identified.



NOTES

1 APPLICABLE STANDARDS/SPECIFICATION

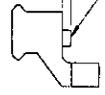
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- B: ANSI Y14.5M-1982
- C: MIL-W-13855

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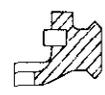


ACCESSORY RAIL, RIGHT  
12993774

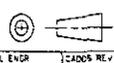
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2-DOWEL PIN  
12993776



PART NO. 12993772

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APPLICATION NEXT ASSY USED ON		MATL ENGR CADOS REV		

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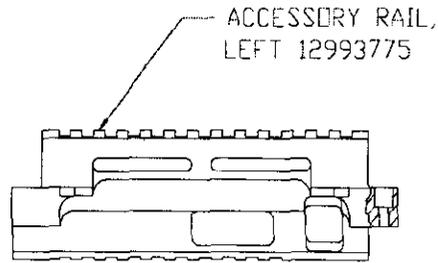
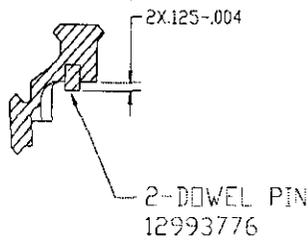
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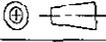
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- A: MIL-STD-100E
- B: ANSI Y14.5M-1982
- C: MIL-W-13855

REVISIONS				
CDAC	REV	DESCRIPTION	DATE	APPROVED
	x2	revised	9/14/99	GJH



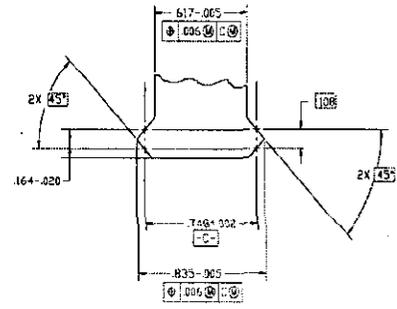
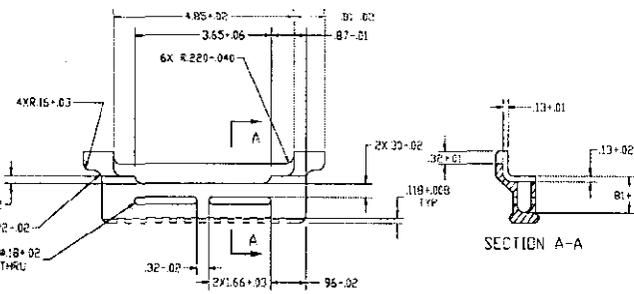
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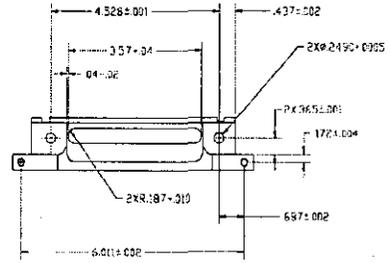
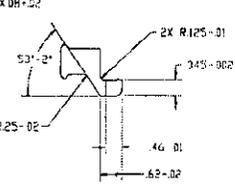
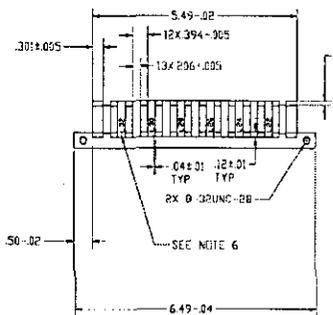
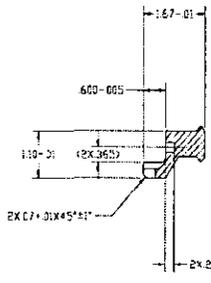
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- 3 PROTECTIVE FINISH MIL-A-8625, TYPE III, CLASS 2  
 FILM THICKNESS .0010+.0002. FINISH SHALL BE LUSTERLESS  
 (FLAT) APPROX BLACK, ND. 3/02B, BUT NO LIGHTER THEN  
 GRAY, ND. 36076
- 4 BREAK ALL SHARP EDGES .005+.010 UNLESS OTHERWISE SPECIFIED
- 5 FINISH  $\sqrt{125}$  UNLESS OTHERWISE SPECIFIED.
- 6 FILL INSCRIBED NUMBERS AND LETTERS WITH FILLER, TYPE 1 OR 2,  
 SPEC TT-F-325, COLOR WHITE NO. 3778 OF FED-STD-595. INSCRIBED  
 NUMBERS AND LETTERS .12+.01 HIGH .01+.01 DEEP X .02+.01 WIDE.

REV	BY	DESCRIPTION	DATE	INITIALS
1	EC	REVISED	9/14/99	GJM
11	EC	ADDED APPROVAL		
12	EC	ADDED INSPECTION LOCATIONS AND NUMBERS AS PER NOTE 4	10/15/00	LM



TYP RAIL PROFILE

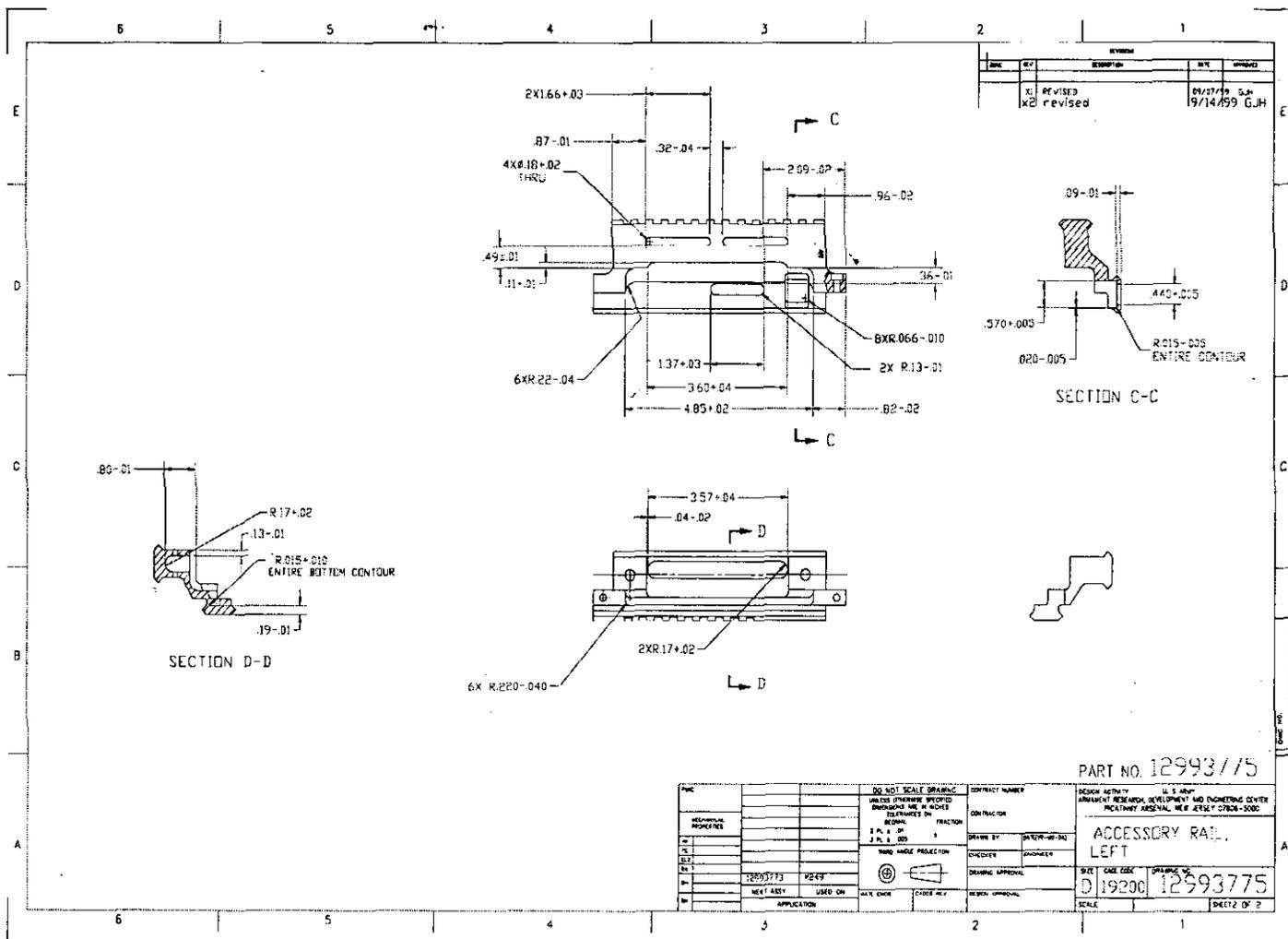
SECTION A-A



PART NO. 12993774

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12993774 NEW ASSY 10/15/00	1:1 12993774 10/15/00	12993774 10/15/00	12993774 10/15/00





REV	DESCRIPTION	DATE	BY	CHKD
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2	revised	10/14/79	G.J.H.	

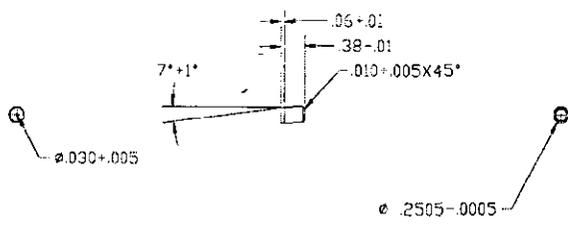
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P/N 12993775 QTY 1 DATE 10/14/79 BY G.J.H.		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UP 1/1	
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NOTES

- 1 APPLICABLE STANDARDS/SPECIFICATION  
 A: MIL-STD-100E  
 B: ANSI Y14.5M-1982  
 C: MIL-W-13855
- 2 MATERIAL STEEL CMPSN 4130, 4140 ASTM A331 OR A322
- 3 HEAT TREAT TO Rc 38.42
- 4 PROTECTIVE FINISH 5.3.1.2 OF MIL-STD-171.

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	x2	revised	9/14/99	GJH



PART NO. 12993776

P/MC MECHANICAL PROPERTIES		DO NOT SCALE DRAWING UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON		CONTRACT NUMBER		DESIGN ACTIVITY U. S. ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER PICATINNY ARSENAL, NEW JERSEY 07808-5000	
TYPE IS EL2 RA BH RH	12993773 12993772 M249 NEXT ASSY USED ON	DECIMAL FRACTION 2 PL. ± .01 3 PL. ± .005	TH-92 ANGLE PROJECTION 	DRAWN BY G.J.H.	DATE (YY MO DAY)	DOWEL PIN	
APPLICATION				MATL ENGR	CADDS REV	DRAWING APPROVAL	DESIGN APPROVAL
CHECKER ENGINEER						SIZE C 19200	DRAWING NO. 12993776
SCALE						SHEET	



**FN MANUFACTURING, INC.**

P.O. BOX 24257, COLUMBIA, SC 29224 (MAILING)  
 797 CLEMSON RD., COLUMBIA, SC 29229 (SHIPPING)  
 (803) 736-0522 (PHONE) (803) 736-4169 (FAX)

25 September 2000

TACOM-RI  
 Department of the Army  
 Armament and Chemical Acquisition and Logistics Activity  
 Building 110  
 Rock Island, IL 61299-7630

**ATTENTION:** Teresa Stottlemyre  
**SUBJECT:** Contract DAAE20-99-C-0113, Bipod, Handguard/Heatshield, Hanger Rail Improvements (M249) (CORRECTED)  
**REFERENCE:** Letter, TACOM-RI, subject: *as above*, dated 11 Jul 00.

Dear Ms Stottlemyre:

In response to referenced letter, the following revised proposal for the Statement of Work (SOW) is provided:

**Bipod, Handguard/Heatshield, Hanger Rail Improvement**

**Phase I**

1)	Phase I work completed to date	
	• Bipod, Handguard/Heatshield, Hanger Rail Design	\$31,262.98
2)	Phase I work to be completed	
	• Finalize Bipod/Handguard for compatibility with GFM Rail	<u>\$14,507.24</u>
	<b>Phase I Total</b>	<b>\$45,770.22</b>

**Phase II**

1)	Manufacture	
a)	Bipod Tooling & Ten (10) each Bipods	\$160,313.12
b)	Handguard Tooling & Ten (10) each Handguards	\$ 62,306.57
2)	Test Equipment (GFM)	
a)	Three (3) M249 SAW's with Standard two (2) Barrels (GFM)	NC
b)	Two (2) each AN/PAQ-4 Laser Pointing Devices (GFM)	NC
c)	One (1) each Laser Boresight (GFM)	NC

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d)	M855 Ball Ammunition (11,000 rounds) (GFM)	NC
e)	M855/856, 4:1 Tracer Ammunition (63,000 rounds) (GFM)	NC
3)	Test & Engineering Design Review & Final Reports	\$13,183.25
	• Test Cook-Off Limit	INCL
	• Handguard Integrity Test	INCL
	• Bipod Stability Test	INCL
a)	Test Equipment	\$ 3,000.83
b)	Firing Range Operator	<u>\$ 3,301.26</u>
	<b>Phase II Total</b>	<b>\$242,105.03</b>

**Phase III**

1)	Engineering Time	\$19,774.80
	• Preparation and Delivery of Level III TDP	
2)	Manufacture	
a)	One hundred (100) Handguards	\$ 3,367.92
b)	One hundred (100) Bipods	<u>\$13,471.69</u>
	<b>Phase III Total</b>	<b>\$36,614.41</b>

**Heatshield Version "B" (New two piece concept similar to M240)** To run concurrently and be an integral part of the overall study.

• Heatshield, Deflector Design	\$ 4,574.20
• Deflector Tooling	\$32,587.47
• Heatshield Tooling	\$38,049.44
• Design of Test and Setup	\$ 3,049.45
• Testing to Schedules I & II	\$ 1,962.14
• Analysis & Reports	<u>\$ 4,574.20</u>
<b>Version 'B' Total</b>	<b>\$84,796.90</b>

**QUOTE SUMMARY**

Phase I	\$ 45,770.32
Phase II	\$242,105.03
Phase III	\$ 36,614.41
Heatshield Version "B"	<u>\$ 84,796.90</u>
<b>Quote Total</b>	<b>\$409,286.66</b>

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**Delivery Schedule (Ref. Para. 3.5, SOW)**

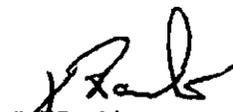
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|---|------------------|
| • Approval of Design Concepts   | 17 November 2000 |
| • Delivery of Preliminary Drawings  | 5 January 2001   |
| • Delivery of Bipod Test Plan   | 16 February 2001 |
| • Production of Prototype Hardware (10 sets)                                    | 27 April 2001    |
| • Testing of Prototype Hardware Completed                                       | 8 June 2001      |
| • Delivery of Final TDP and 100 Front End Assemblies (per paragraph 3.2.5, SOW) | 31 August 2001   |

**Terms and Conditions:**

- |  |  |
|--|--|
| a) Packaging:  | Best Commercial                              |
| b) Inspection/Acceptance:  | Origin                                       |
| c) FOB Point:  | Origin                                       |
| d) Validity:   | This proposal will remain valid for 90 days. |
| e) Any other terms and conditions, not specifically stated herein, will be subject to negotiation and acceptance by TACOM-RI and FNMI. |  |

Should you have any questions, or need additional information, please contact Joe Taylor at 803/736-0522, Ext. 346 or joet@fmmfg.com.

Sincerely,



Jeff Rankin  
Director, Contracts / Sales & Marketing