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TEMPERATURE MEASUREMENT OF TUNGSTEN AND BERYLLIUM TARGETS IN AIR

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AGS DIVISION TECHNICAL NOTE

No. 83

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TEMPERATURE MEASUREMENT OF TUNGSTEN AND BERYLLIUM TARGETS IN AIR

We have measured the equilibrium temperature change in air of two typical external beam targets exposed to 28 GeV protons. Iron/Constantan thermocouples of 30 gauge wire were used with the reference junction at ambient temperature. The proton beam pulse duration was $\sim$ 400 msec with a 2.4 sec repetition period. The results and some target characteristics are shown in the table. The time constants, τ, are only approximate.

Tgt	ΔT eq./10^{12}ppp	Cross Section	L, length	τ	ρL	ρL dE/dx/Proton
B_e	30°C	.1" x .2"	4.72"(12 cm)	$\leqslant$ 3 min	22 g/cm^2	40 MeV
W	260°C	.1" x .2"	2.5"(6.3 cm)	$\approx$1.5 min	122 g/cm^2	180 MeV

Drawings of the target and thermocouple details are shown in the figures. Note that the tungsten target head was separated from its holder by a .040" mica washer, but attached to the holder by stainless steel screws.

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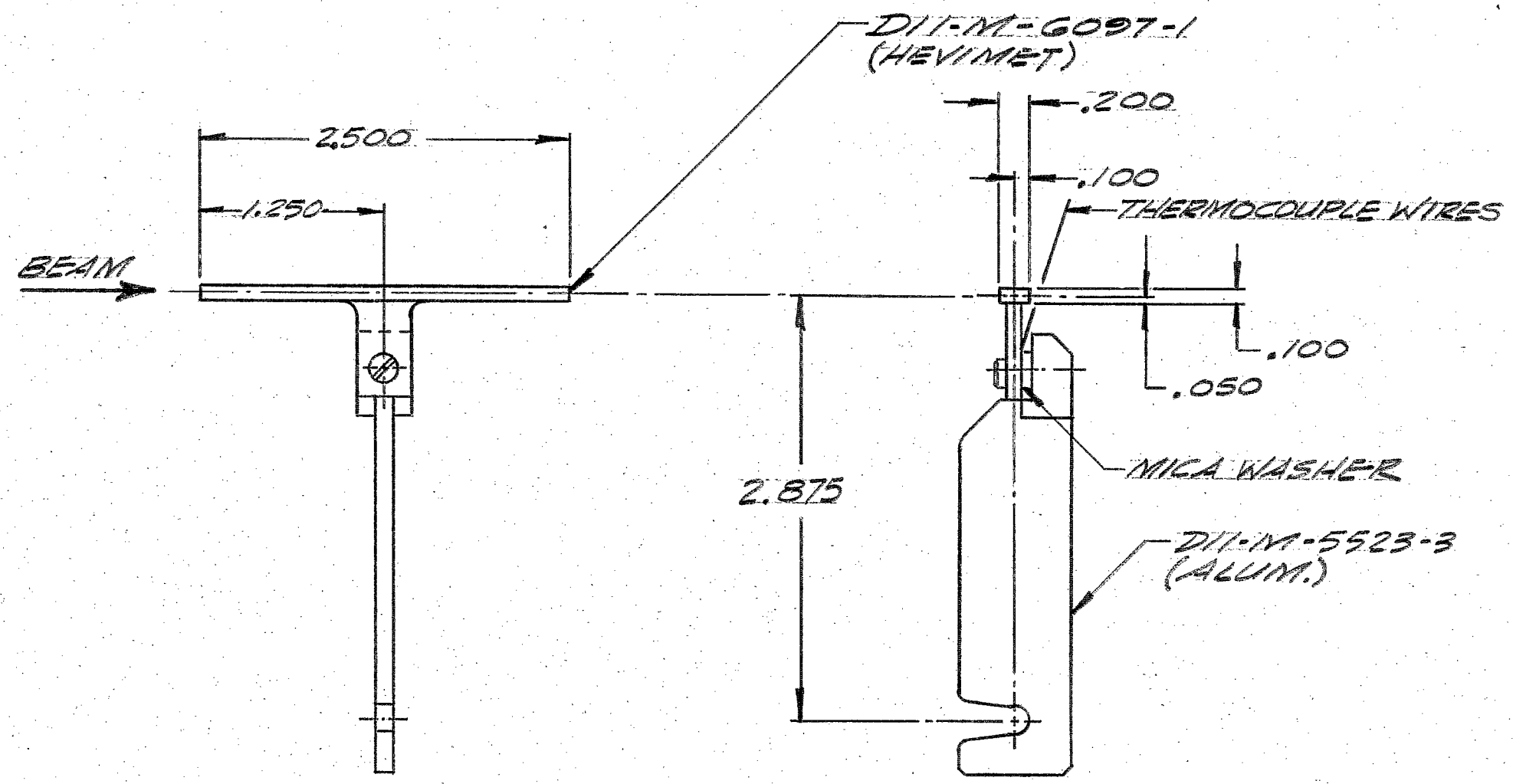
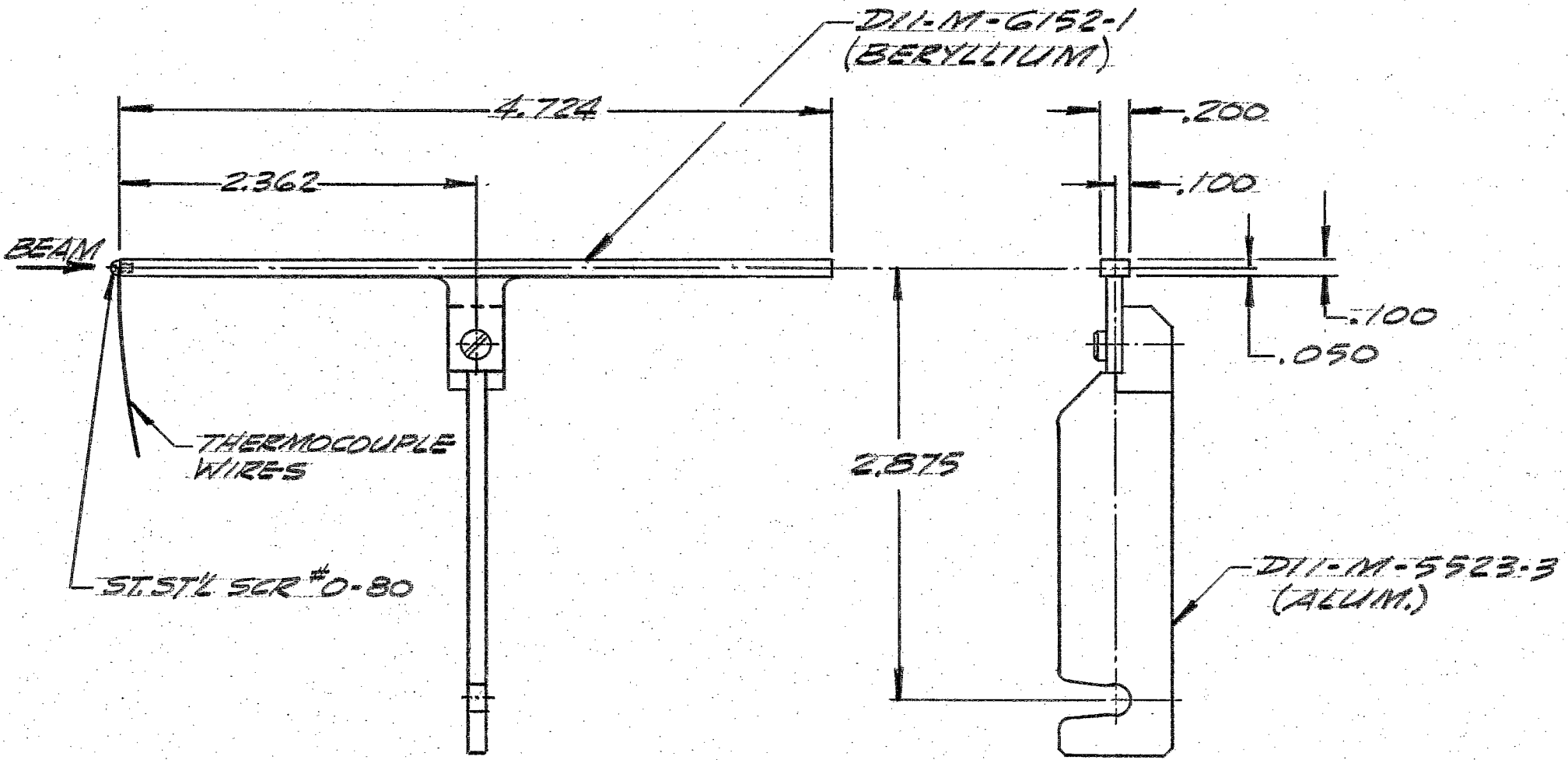


SLOW EXTERNAL BEAM HEVIMET TARGET CONFIGURATION
USED WITH TARGET TURRET D11-M-5227-5

FIGURE 1



SLOW EXTERNAL BEAM BERYLLIUM TARGET CONFIGURATION
USED WITH TARGET TURRET DII-M-5227-5

FIGURE 2