1 Introduction

The Continuous Electron Beam Accelerator Facility (CEBAF) is engaged in the construction of a continuous wave electron accelerator using superconducting accelerating cavities. The maximum energy of the accelerator will be over 4000 MeV, and the maximum electron current to be used in nuclear physics experiments is 200 μA.

Three experimental halls A, B, and C, will be equipped with various detectors and other experimental equipment necessary for conducting the scientific program. Experimental Hall A will house two High Resolution Spectrometers. The focal planes of both spectrometers will be instrumented with drift chambers, time-of-flight (TOF) scintillation counters, Cerenkov counters, and lead-glass electromagnetic shower counters.

This specification is for coax cables used in counting work. The purpose of the cable is to provide pulse energy transfer with known delays.

2 Statement of Work

The vendor shall provide all labor, equipment, and facilities to fabricate, test, and deliver coax patch cables with performance and packaging as specified in this document.

3 Coax Patch Cable Specification

3.1 Cable

The cable used shall be Belden type 9907.

3.2 Lengths of Assemblies

The length given is the tip-to-tip overall length.

Tip-to-tip overall length (in inches)

$1260 \pm \frac{3}{2}$ inches

3.3 Labeling

Each manufactured cable shall be labled as to length in feet. Each cable shall be labled at each end, approximately one inch from the connector ferrule. Labeling shall be by hot-stamping with white lettering directly on the cable jacket. Alternatively, the cable may be labled by lettering on a piece of shrink tubing that is shrunk to the cable. No shrink-on tubing is to be applied over the junction of the cable and the connector ferrule.

3.4 Connectors

Both ends of the cable assembly shall have a BNC style 50 ohm constant impedance connector. The connector shall have a gold plated, captive center contact and a tarnish resistant finish on the outer body.

The BNC connectors may be one of, or shall be equivalent to;

- Kings part number KC-59-400
- Amphenol part number 31-320
- AMP part number 1-221128-1

Alternative connectors may be used subject to approval by TJNAF. Manufacturer shall submit specifications and drawings for proposed alternate connectors.

3.5 Electrical

The cable shall be free of open connections and have good continuity along the central conductor. The cable shall be free of open connections and have good continuity along the shield conductor. The cable shall be free of resistive shorts between the center conductor and the shield conductor.

3.6 Mechanical

Crimp tooling utilized shall be as recommended by the manufacturer. The center conductor shall be visible at the center pin inspection hole after the pin has been crimped. The cable outer jacket shall be securely crimped between the braid ferrule and the connector body. Sharp bending of the cable at the connector body shall not result in the outer jacket pulling away from the connector or exposure of the cable braid. Threaded connector parts shall be securely tightened during final assembly.

4 Acceptance Criteria

Acceptance of the coax patch cables will take place at CEBAF within 1 week after receipt. The acceptance tests consist of simple procedures which quickly check basic functioning of the cables. They are not intended to substitute for the manufacturer warranty on each individual cable meeting the specifications. Cables satisfying the following checks will be accepted.

4.1 Visual Inspection

Each coax patch cable will be inspected visually for physical damage. The cable will be inspected for broken connectors, cut jacketing or pinched cable indicating possible damage to the dielectric or conductors.

4.2 Performance

At a mimimum, the following performance tests will be performed.

- Five random cables from each group of coax patch cables will be tested to verify that they have a length within the specified ranges and satisfy the electrical specifications.

5 Warranty

The manufacturer shall warrant the performance of all coax patch cables, as specified previously, to be free of defect in material or manufacture.

6 Experience

Previous experience of the company is relevant to this project. The manufacturer shall have experience in the last 2 years in manufacturing and marketing coaxial cable assemblies suitable for use in sensitive electronics applications. The manufacturer shall have supplied cable assemblies that have been successfully used in sensitive electronics applications.