



## BPM Upgrade Cable Specification

Bob Forster

### Introduction

We are soliciting pricing and delivery information regarding each item in Table 1 below. We also request optional pricing and delivery information regarding labeling both ends of the cables of items 2, 3 & 4 according to details given below.

### Requirements

Several explanatory notes follow the table of “BPM Project Interconnect Cables” given below.

**Table 1: BPM Project Interconnect Cables:**

Item #	Quantity (Each)	Cable Type	Connector A	Cable Length	Connector B	Cable Name, for reference	Delivery Requirements
1	1,104	RG316U 50-Ohm Coax	SMB Plug	4 Inch $\pm\frac{1}{4}$ Inch	SMB Plug	In-Crate Slot Jumpers	Delivered Packed in Sets of 8 each
2	300	RG400U 50-Ohm Double Shielded Coax	SMB Plug	2 Foot $\pm\frac{1}{4}$ Inch	SMB Plug	In-Crate Timing Distribution	Delivered Packed in Sets of 10 each
3	90	RG400/U 50-Ohm Double Shielded Coax	SMB Plug	36 Foot $\pm 1$ Inch	Lemo Straight Plug LEMO Connector FFS.00.250.CTCE56 or approved equivalent	Accelerator Timing Inputs	Delivered Packed in Sets of 3 each
4	1,104	RG400/U 50-Ohm Double Shielded Coax	N Female	6 Foot $\pm\frac{1}{4}$ Inch	SMB Plug	BPM Analog Inputs	Delivered Packed in Sets of 8 each

## **Quantity**

The quantities of each cable are specified in the table above.

## **Delivery Schedule**

The proposed delivery schedule must be specified in the reply to this bid package.

Naturally, we hope for delivery of these cables as early as possible, or by September 1, 2004. Once the Purchase Order is awarded, partial deliveries will be welcomed.

## **Delivery Requirements**

The cables are to be delivered packed in sets as tabulated in Table 1, above, using Tie Wraps™ or Zip Ties™ or the equivalent.

## **Acceptance Criteria**

Incoming acceptance testing will be performed at Fermilab, using TDR and/or Network Analyzer equipment.

Each of the cables listed in Table 1 above is subject to rejection at our discretion if

- a) incoming testing shows it to have a Return Loss greater than  $-40$  db @ 53 MHz while resistively terminated in 50 Ohms, or
- b) incoming testing shows it to have an Attenuation greater than 1 db at a test frequency of 100 MHz or below, or
- c) incoming TDR testing shows it to have an effective length deviating from that specified in Table 1.

The cable lengths are critical to the operation of the Fermilab accelerator. Some of the cables this system interfaces with are length matched to the point of being phase-matched. Cable lengths are very important in this system, so the length tolerances in Table 1 are specified pretty tight.

Those cables failing to meet or exceed the specified initial acceptance criteria will be rejected and returned to the vendor for replacement.

## **Notes on Our Request for Optional Cable Labeling Pricing**

We request information giving us the option of including cable labeling in this contract.

Should we elect to exercise that external labeling option, then cable labels will be specified in detail at a later date to the vendor awarded this purchase order. At that time we will provide up to three lines of up to 19 characters of text for each label. Labels will be somewhat sequential within the bundling groups in the table.

Environmentally, the cables will not be outside but will be handled and will get to hot (110°F) and cold (40°F) room temperatures. The labels need to have a lifetime of 20 years or so; putting shrink tubing on the labels to protect them from the elements is perfectly acceptable. Obviously, the text must not smear.

Please detail your label proposals for the RG400 cables listed above. Light text on a dark background or vice versa, either is just fine. Good contrast and long term readability is the goal.

## **References**

## **Change Log**

<b>Version</b>	<b>Issue Date</b>	<b>Concurrence</b>	<b>Description of Change</b>
1.0	July 15, 2004	RGF	Original

## **Concurrence**

The following persons concur with this document.

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Steve Wolbers, Project Manager (date)

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Bob Webber, Deputy Project Manager (date)

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Jim Steimel, Technical Coordinator (date)