



# WFMOS PROJECT
# 90.00.00.01_10.00.00.00_ICD
# Version: 3

# WFMOS to Telescope

# ICD

| Version: | 3 | Date: |
|---|---|---|
| **Issued by:** | Scot Kleinman | 8May08 |
| **Approved by:** | Subaru Manager: | |
| | Gemini Manager: | |
| | Gemini Engineering: | |

# 90.00.00.01_10.00.00.00_ICD, Revision Control

Revision: 1, Scot Kleinman, 13Apr08.

Revision: 2, Scot Kleinman, 15Apr08 – minor format mods.

Revision: 3, Scot Kleinman, 8May08 – added info. on spider-mounting and cabling.

# Contents

## 1. Introduction

This document describes the physical interface between WFMOS and the Subaru Telescope except for any interfaces that are taken care of by PHSC as described in document 90.00.00.01_15.10.00.00_ICD. The Telescope control software interface is described in document 90.00.00.01_80.10.40.00_ICD.

WFMOS must co-exist with FMOS. That is, WFMOS cannot take over resources currently being used by FMOS. There are no current plans to de-commission FMOS before WFMOS arrives.

## 2. Related Documents

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| Document Number | Document Name |
|---|---|
| 10.45.00.00_DWG | Tertiary Mirror Baffle layout |
| 20.10.10.00_DWG | Primary mirror reflectivity, post-aluminization |
| 20.10.10.01_DWG | Primary mirror reflectivity degradation w/ time |
| 50.10.20.10_REF | FMOS Fiber Routing |
| 50.10.20.19_DWG | FMOS fiber bundle & Spider Tray dimensions |
| 90.00.00.01_15.10.00.00_ICD | WFMOS to PHSC |
| 90.00.00.01_30.00.00.00_ICD | WFMOS to Telescope Enclosure |
| 90.00.00.01_80.10.40.00_ICD | WFMOS to Software |

## 3. Fiber Routing

The Feasibility Study proposal of the permanently hanging fiber bundle along the great wall is unacceptable to Subaru. There are concerns about various different tight clearance tolerances as well as the dynamics and effects on pointing of such a solution.

Therefore, the fiber bundle will most likely need to go through the altitude axis cable wrap into the Nasmyth platform then up to the spectrograph room. There also needs to be a simple way to connect and disconnect the fiber bundle to the instrument in the PFU.

The two photos below show how the FMOS fibers are mounted. The left photo shows the FMOS fiber bundles (the thick black cables tied with the white rope) at the fixed side of the altitude axis cable wrap on the IR (-x) side of the telescope. The blue I-beam at the edge of the photo is the Nasmyth platform floor. Along with the FMOS fiber bundles are the gray ducts, silver He lines, and other cabling which come from the Nasmyth floor through the space

at the bottom left of the photo into the cable wrap. We expect WFMOS cables could be similarly routed in the space available. The photo on the right shows the FMOS fibers connected to inner hub of the top ring. These photos and others are available in document 50.10.20.10_REF and references therein.

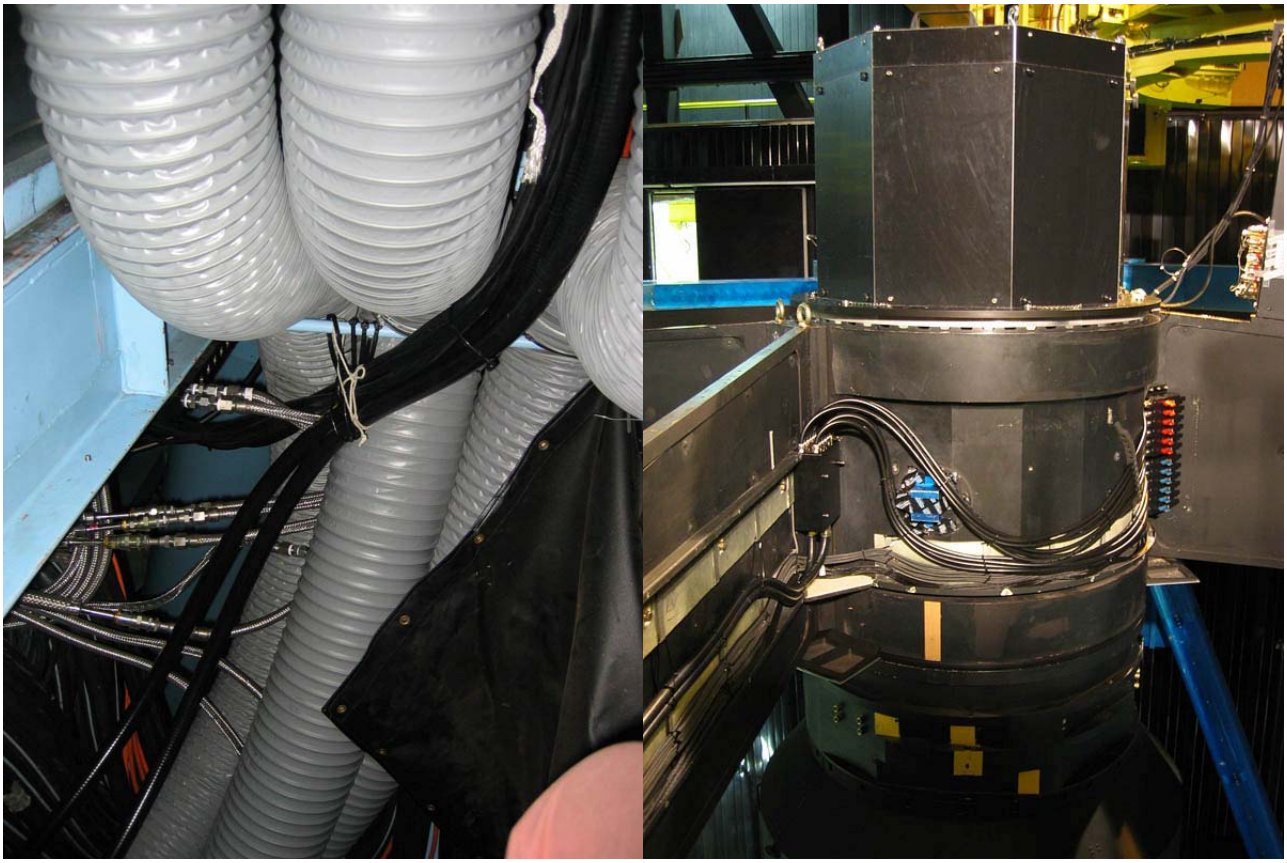

**Figure 1:** Some details of FMOS fiber routing. 50.10.20.17_DWG and 50.10.20.14_DWG.

## 4. Auxiliary Equipment Mounting

There are two obvious places where small bits of auxiliary equipment can be mounted to the telescope outside of the PFU: the top ring structure and the tertiary mirror baffle.

On the top ring, small items, up to 10kg (maybe less) can be mounted on the +Z side of the top ring, or on the enclosure facing side, out of the main telescope beam, provided they are not significant heat sources when WFMOS is not on the telescope.

Drawing 50.10.20.19_DWG shows the dimensions of the spider cable tray. There are two small areas of the spider vanes that are above and below the cable trays. Items could be mounted here as long as they do not stick out more than the 30mm of the cable trays. Alternatively, items could be mounted on the top of the spider vanes, but again, can extend to know more than 30mm outside the vanes (in the x-y plane). In all these areas, it would be

acceptable to mount something that extends during WFMOS use beyond 30mm as long as it is either removed or retracted when WFMOS is not in operation.

The spider vanes are made of Fe while the cable trays and covers are made of Al. Holes and other simple modifications can be performed for the purpose of securing equipment. It is also possible to extend the spider vanes up to 50cm in the +z direction for additional mounting space.

The outside of the tertiary mirror baffle is also a possible source for small items, preferably at its base. Some space here is currently being used for illumination lamps. Drawing 10.45.00.00_DWG shows the tertiary mirror baffle dimensions.

The back of the mirror cover might also be usable for mounting small bits of auxiliary equipment. Keep in mind, though, that it takes ~15 minutes to either open or close the mirror cover.

Subaru would want to approve any choices here, so please contact the AURA technical representative if you plan to mount any auxiliary equipment.

## 5. Primary Mirror Reflectivity

The primary mirror reflectivity is shown in Figures 2 and 3, below. Figure 2 shows the reflectivity immediately after the last two re-aluminizations. Figure 3 shows the degradation in reflectivity for two sample wavelengths after re-aluminization.

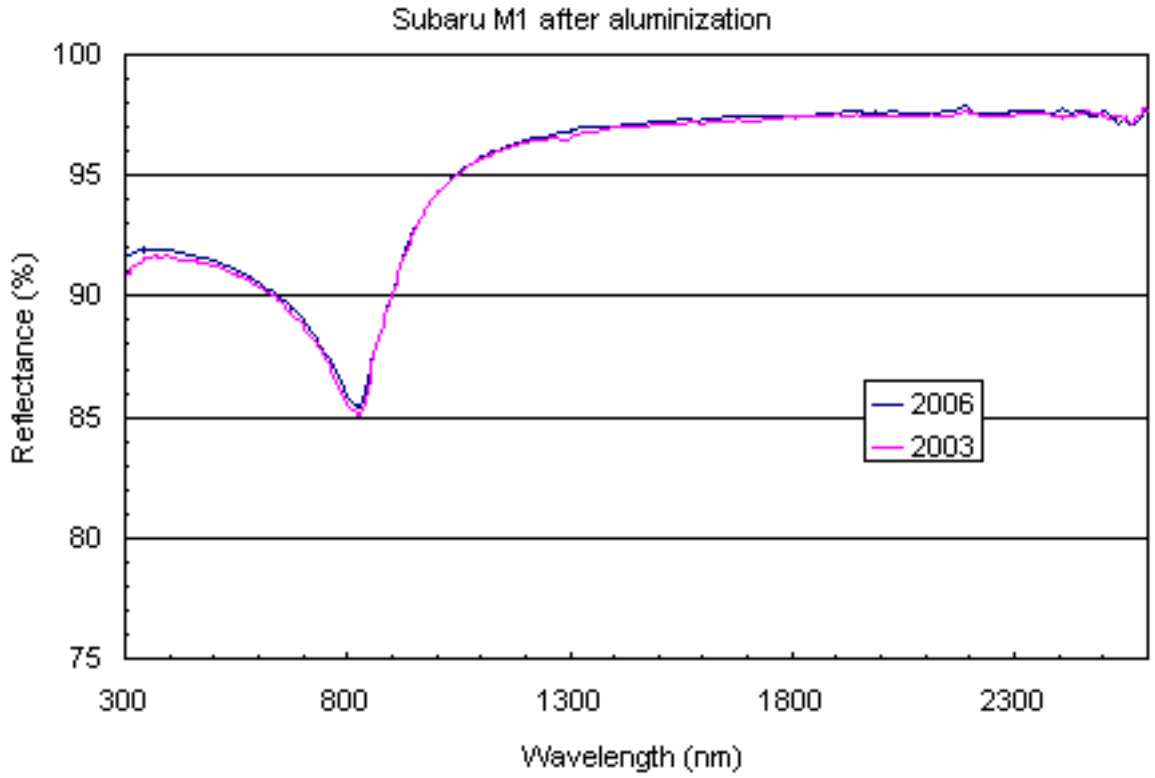


**Figure 2:** Subaru primary mirror reflectivity after re-aluminization. 20.10.10.00_DWG.

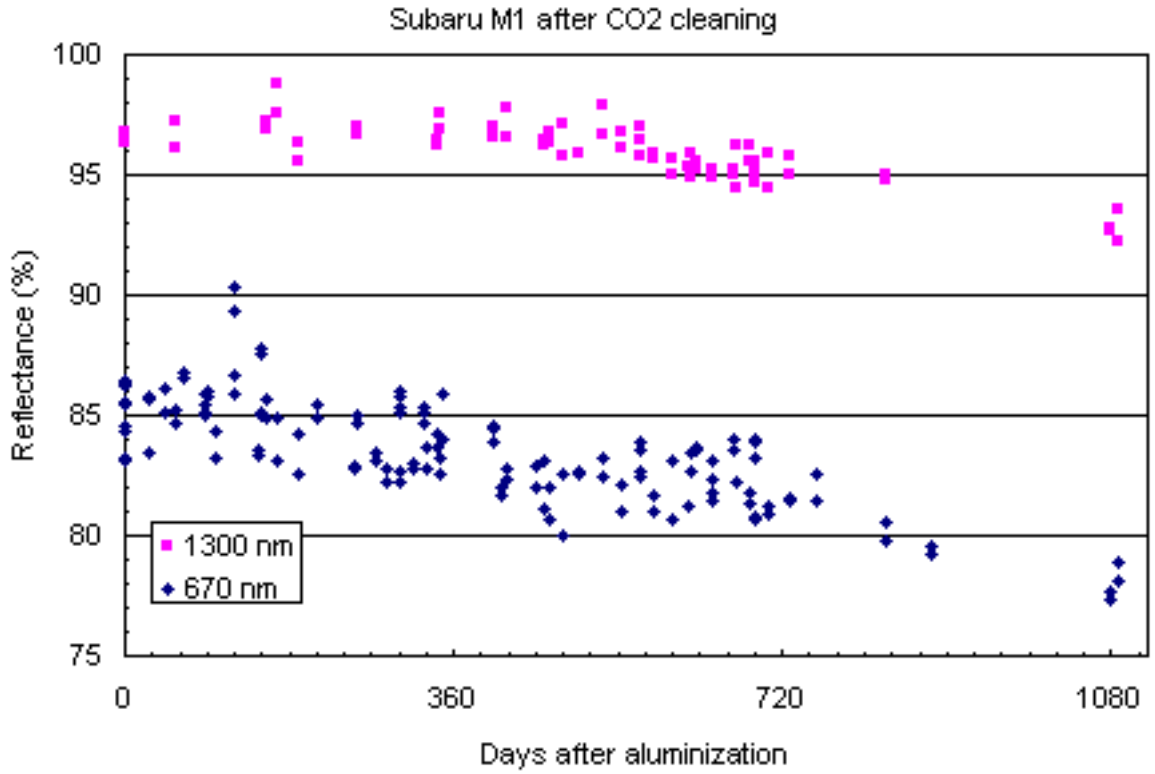


**Figure 3:** Subaru primary mirror reflectivity vs. days after aluminization. 20.10.10.01_DWG.