# PACKAGING PROCEDURE

## INTEGRAL FIEL UNIT

### KCWI

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### Versions

| A | First issue |

### Modifications

| A | First issue |

### Spreading:

WINLIGHT OPTICS: File and QA.

CALTECH: P. MORRISSEY
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- **8.1 UNPACKING**: Page 4
- **8.2 PACKING**: Page 14

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1 **SUBJECT**

This document describes the procedure to use to pack and unpack the “INTEGRAL FIELD UNIT” for KCWI spectrograph.

Important note: Each picture shows a specific action to do. These are just for examples and sometimes they have been taken during the tests before packaging.

2 **DOCUMENT**

KCWI IFU nomenclature: WO4340-010-NOM1
SLICERS INSTALL WO4453-900-PRO003

3 **TOOLS AND PRODUCTS**

- Vinyl scotch tape 50mm, Kapton scotch tape 25mm
- Scissors
- Set of hexagonal screwdriver CHC M1.5 to M8
- Ethyl alcohol
- Polyurethane slipcover to envelop the main structure
- U nitrogen, Optical cleaner
- Gloves, Mask

4 **MANUFACTURING TOOLS**

Grey room class 100,000

5 **MEASURING TOOLS**

None

6 **ENVIRONMENT**

Temperature: $18^\circ\text{C} \leq T^\circ\text{C} \leq 22^\circ\text{C}$
Relative humidity: $30\% \leq H_r \leq 70\%$

7 **PARTICULAR CAUTION**

Use gloves and mask to manipulate the slicers. The slicers don’t have to be cleaned but they need to be blown.

All the mirrors and slicers are sensitive to the shocks.
All the manipulations and handling have to be done with at least 2 persons
8 OPERATIONS

8.1 UNPACKING

U1
Remove the 4 screws at corners of the crate

U2
Overview of what you see at the beginning of the unpacking procedure

U3
loosen the 2 flight cases from the clamping strap
U4
Remove the 2 flight cases from the wooden crate

U5
Unscrew the 4x2 screws M8 linked the bars to the shock absorbers
U6
Lift the bench using the lifting rings

U7
Transfer the bench on a lifting table
U8
Transfer the bench on a table top

U9
Unscrew the lifting rings
U10
Remove the vinyl scotch tape

U11
Remove the Kapton scotch tape
U12
Remove the 4 M6 screws of the shipping cover

U13
Temporary screw the lifting ring to put the bench at vertical position

U14
Put the bench at vertical
(Take care because at this moment the shipping cover is not linked to the bench)
U15
Loosen and remove the 2 bars

U16
Remove the external slipcover

U17
Remove the internal slipcover
U18
Take away the shipping cover

U19
Put the bench horizontal
U20
Remove the lifting plate from the frame

U21
Remove the Kapton scotch tape from the wires
U22
Remove the 2 screws from the columns

U23
Remove the 2 slicer covers from the platform
(keep the covers horizontal to keep the screws at place)
U24
Remove the 2 screws from the frame

U25
Apply the procedure WO4453-900-PRO003 to install the slicers and the camera on the IFU bench

8.2 PACKING

P1
Apply the procedure WO4453-900-PRO003 to remove the slicers and the camera from the IFU bench

P2
Screw the 2 M6 screws in place on the frame and secure its with Kapton tape and optical paper (optical paper is to partially protect the painting on the frame)
P3
Screw the 2 slicer cover on the platform
Add Kapton scotch tape to secure the these assemblies and to stop-up the crews

P4
Screw the 2 M6 screws in place on the 2 columns and secure its with Kapton tape
P5
Attach the wire together with Kapton scotch tape

P6
Assemble the lifting plate with the frame and secure the screws with Kapton scotch tape
P7
Temporary screw the lifting ring to put the bench at vertical position

P8
When the bench is vertical, place the shipping cover in front of
Envelop the main structure with a polyurethane slipcover

Envelop the main structure with a second polyurethane slipcover

Link the 2 bars to the rear surface of the bench with the M6 screws and secure with Kapton scotch tape
The top bar is screwed on the second line of tapered holes
The bottom bar is screwed on the last line of tapered holes
P12
Put the bench horizontal

P13
Screw the shipping cover with the 4 M6 screws. The screws have to be outside of the 2 slipcovers

P14
Roll the first slipcover and stick it with Kapton scotch tape
P15
Roll the second slipcover and stick it with vinyl scotch tape

P16
Redo the 2 last items on the opposite side
P17

Screw the lifting rings (one on the lifting plate and the two other ones on the side of the base plate)

P18

Transfer the bench on a roller lifting table
P19
Open the wooden crate and check the location of the shock absorber

P20
Lift the bench
P21

Use foam to absorb the potential shock you could have when you move down on the shock absorbers

P22

Screw the 4x2 screws M8 and after use glue to secure the tightening
P23

Put the 2 flight case at the end of the wooden crate (side of the top of the bench)

IMPORTANTE NOTE: The slicers have been previously orientate to be horizontal when the flight case is vertical

P24

Tighten the 2 flight cases with a clamping strap
Overview of what you see at the end of the packaging procedure

To make stronger the wooden crate, add wooden screws at corners of the crate

9 QUALITY ASSURANCE

The project will be managed according to ISO9001 standard.

As part of the quality control procedures, if a non-conformity arises from any moment during the development of the work, the contractor will immediately communicate it to CALTECH or WINLIGH OPTICS.