### TBM 1: Prepare Assembly Aid Tray for Force Fitting

Team name:		
Referee I:, Referee II:		
Date and time:		
Duration: □ Timeout		
Achievements		
The robot correctly identifies the assembly aid tray QR code Comment:	yes	no
The robot correctly identifies the containers QR code  Comment:		
The robot correctly grasps the assembly aid tray:  Comment:		
The robot correctly grasps the first bearing box:  Comment:		
The robot correctly grasps the second bearing box:  Comment:		
The robot inserts the first bearing box into the aid tray:  Comment:		
The robot inserts the second bearing box into the aid tray:  Comment:		
The robot correctly deliver the tray to the force fitting station:  Comment:		
The robot completely processes the first bearing (from identifying to delivering):  Comment:		
The robot completely processes the second bearing (from identifying to delivering):  Comment:		
The robot cooperates with CFH and Networked Devices throughout the task:  Comment:		
Benchmarking data is delivered appropriatly  Comment:		

Penalized Behaviors	
The robot bumps into obstacles in the test bed:	
The robot drops an object (the object touches the ground):	
The robot stops working:	
Disqualifying Behaviors	
The robot damages or destroys the objects requested to man	nipulate:
The robot damages the test bed:	
Comment:	
WARNING: A disqualifying behavior discards all other achievements in the current when it is really necessary (e.g. cheating).	task. Use it only
Team leader signature:	
Referee signature:	

## TBM 2: Plate Drilling

Team name:	
Referee I:, Referee II:	
Date and time:	
Duration: □ Timeout	
Notes on TBM 2 to teams/referee/organizer:  The cover plates are organized in the conveyor belt with the order of <b>unusal</b> faulty-faulty (yes, specifically in this order). The reasoning is because procecover plate is "simpler" than processing faulty ones. As such the only way to ento have the same ordering of the cover plates.	essing unusable
Achievements	
The robot collect the cover plate box from the shelves The robot correctly grasp the plates The robot place the cover plate box to the correct workspace The robot correctly sort the plates Set 1 Picking and placing parts The robot picks up an unusable cover plate from the conveyor belt exit ramp The robot places an unusable cover plate inside the trash box container The robot collects the achievements for set 1 Comment:	
Set 2 Preparing the drilling process  The robot performs the drilling process for faulty plates  The robot picks up a faulty cover plate from the conveyor belt exit ramp  The robot delivers a faulty cover plate to the drilling machine workstation  The robot inserted a faulty cover plate into the drilling machine  The robot collects the achievements for set 2  Comment:	
Set 3 Finishing the drilling process  The robot operates the drilling machine to fix a faulty cover plate  The robot picks up a perfect cover plate in the drilling machine  The robot places a perfect cover plate inside the cover plate box  The robot collects the achievements for set 3  Comment:	
The robot cooperates with CFH and Networked Devices throughout the task	
Comment:  Benchmarking data is delivered appropriately  Comment:	

Penalized Behaviors	
The robot bumps into obstacles in the test bed:	
The robot drops an object (the object touches the ground):	
The robot stops working:	
Disqualifying Behaviors	
The robot damages or destroys the objects requested to man	nipulate:
The robot damages the test bed:	
Comment:	
WARNING: A disqualifying behavior discards all other achievements in the current when it is really necessary (e.g. cheating).	task. Use it only
Team leader signature:	
Referee signature:	

## TBM 3: Fill a Box with Parts for Manual Assembly

Team name:						
Referee I:	, Refere	ee II: _				
Date and time:						
Duration:   □ Timeout						
Achievements						
The robot picks up a required object or container from its storage location:  Comment:			part 3	part 4	part 5	$\Box$
The robot places required objects into the container:  Comment:						-
The robot delivers a correctly filled container at the designated workstation:  Comment:						
The robot cooperates with CFH and Ne Comment:			_		task:	yes no
Benchmarking data is delivered appropriately Comment:						
Penalized Behaviors						
The robot bumps into obstacles in the t	est bed:					
The robot drops an object (the object t	ouches t	he groun	.d): 🗆 [			
The robot stops working:						
Disqualifying Behaviors						
The robot damages or destroys the objection	ects requ	ested to	manipul	ate:		
The robot damages the test bed:						
Comment:  WARNING: A disqualifying behavior discards all other when it is really necessary (e.g. cheating).	achievemen	nts in the cu	irrent task.	Use it only		
Team leader signature:						
Referee signature:						

# FBM 1: Object Perception

Referee	I:		, Re	feree II:			
Date an	d time:						
Notes:							
• The	e duration is l	pased on the	ne referee sto	p watch.			
	neout is checl ation.	ked when t	the robot car	nnot detec	t the object	within the	specified test
• GT	is the ground	d truth whi	ich is the info	ormation p	rovided by t	the referee b	ox.
• Ob.	ject identifier:						
_	- EM-01(1)=	aid trav, El	M-02(2) = cov	er plate bo	ΟX		
	- AX-01(4)=1					me B	
	- AX-02(6) = 1		· - ·	` '		ро В	
	1111 02(0)—1	ocaring, 112	1 05(1)—11100	01, 1111 00	(9)—axis		
Run 1 🛭	Ouration:		l Timeout				
Object D	etection						
CT	Contai	ner	Bearing	g Box		Transmission	n
GT	EM-01(1)	EM-02(2)	( )	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Contai		Bearing			Transmission	
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Pose						T	
$\operatorname{GT}$	X	У	$\theta$	Robot	X	У	$\theta$
Commen	ts:						
	05.						
D 0.F		_	1 m: ,				
	Ouration:		l Timeout				
Object D		T	D :	D	П		n
GT	Contain EM-01(1)		Bearing AX-01(4)	$\frac{g \text{ Box}}{AX-16(3)}$	AX-02(6)	$\frac{\text{Transmission}}{ \text{AX-09}(7) }$	AX-03(5)
	Contai	` ′	Bearing		\ /	Transmission	
Robot		EM-02(2)		AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Pose							
GT	X	у	θ	Robot	X	У	θ
O I							

Object I	Duration:							
Object 1	Detection		·		П			
$\operatorname{GT}$	Conta		Bearin	_		Transmission		
<u> </u>	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	$AX-02(6) \mid AX-09(7) \mid AX-03(5)$		
Robot	Conta	iner	Bearin	g box		Transmission		
1,000	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Pose								
- CF	X	у	$\theta$		X	у	$\theta$	
GT				Robot				
Commo	nts:	1						
Jonniner	.105.							
Run 4	Duration:	Γ	l Timeout					
Object I	Detection							
$\operatorname{GT}$	Conta		Bearing Box			Transmission		
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Robot	Container		Bearing box		Transmission			
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Pose								
	77	***	θ		37	77	$\theta$	
GT	X	У	0	Robot	X	У	U	
Commer	nts:							
			l Timeout					
Run 5	Duration:							
	Duration: Detection							
Object I	Detection		Regrin	g Roy		Transmissio	n	
	Detection Conta	iner	Bearin	~		Transmission		
Object I	Detection Conta	iner EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Object I	Conta EM-01(1) Conta	iner EM-02(2)	AX-01(4) Bearin	AX-16(3) g box	AX-02(6)	AX-09(7) Transmission	AX-03(5)	
Object I GT	Conta EM-01(1) Conta	iner EM-02(2)	AX-01(4) Bearin	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Object I GT	Conta EM-01(1) Conta	iner EM-02(2)	AX-01(4) Bearin	AX-16(3) g box	AX-02(6)	AX-09(7) Transmission	AX-03(5)	
Object I GT Robot Pose	Conta EM-01(1) Conta	iner EM-02(2) iner EM-02(2)	AX-01(4) Bearin	AX-16(3) g box AX-16(3)	AX-02(6)	AX-09(7) Transmission AX-09(7)	AX-03(5)	
Object I GT Robot	Conta EM-01(1) Conta EM-01(1)	iner EM-02(2)	AX-01(4)  Bearin AX-01(4)	AX-16(3) g box	AX-02(6) AX-02(6)	AX-09(7) Transmission	AX-03(8	
Object I GT Robot Pose	Conta EM-01(1) Conta EM-01(1) X	iner EM-02(2) iner EM-02(2)	AX-01(4)  Bearin AX-01(4)	AX-16(3) g box AX-16(3)	AX-02(6) AX-02(6)	AX-09(7) Transmission AX-09(7)	AX-03(5)	

	$\frac{\text{Detection}}{\ }$	ainer	Bearin	g Roy		Transmission	<u> </u>	
GT	EM-01(1)		AX-01(4)	$\frac{\text{g box}}{\text{AX-16(3)}}$	AX-02(6)	AX-09(7)	AX-03(5)	
	Cont	` '	Bearin	· /	` ′	Transmission		
Robot	EM-01(1)	$\frac{\text{EM-02}(2)}{\text{EM-02}(2)}$	AX-01(4)	$\frac{g}{AX-16(3)}$	AX-02(6)	AX-09(7)	AX-03(5)	
Pose		2111 02(2)	1111 01(1)	1111 10(0)	1111 02(0)	1111 00(1)	1111 00(0)	
	X	у	θ		X	у	$\theta$	
GT	A	J J		Robot	A	J J		
Comme	nts:							
Run 7	Duration:		] Timeout					
Object 1	Detection							
OTT.	Cont	ainer	Bearin	g Box		Transmission		
GT	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Robot	Cont	ainer		Bearing box		Transmission		
πουσι	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
Pose								
GT	X	У	θ	Robot	X	У	$\theta$	
Comme	nts:							
Run 8	Duration:	Г	] Timeout					
			1 Imeout					
Jbject 1	Detection							
GT	Cont		Bearin			Transmission		
GI	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
<u> </u>	Cont		Bearin	_		Transmission		
Robot	EM 01/1)		AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)	
	EM-01(1)	EM-02(2)	\ /					
	EM-01(1)	EMI-02(2)						
Robot	EM-01(1)	y y	θ	Robot	Х	У	$\theta$	

Run 9 I	Ouration:		] Timeout				
Object I	Detection						
GT	Cont	ainer	Bearin	ıg Box		Transmission	n
GI	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Robot	Cont	ainer	Bearin	ng box		Transmission	n
Robot	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Pose							
GT	X	у	θ	$\theta$ $x$		у	$\theta$
GI				Robot			
	Duration						
	Duration: _		☐ Timeout				
Object L	Detection						
GT	Cont			ng Box		Transmission	
	EM-01(1)	( )	AX-01(4)		AX-02(6)	\ /	AX-03(5)
Robot	Cont		Bearin			Transmission	
	EM-01(1)	EM-02(2)	AX-01(4)	AX-16(3)	AX-02(6)	AX-09(7)	AX-03(5)
Pose							
GT	X	У	θ	Robot	X	У	θ
Commen	nts:						
Benchn	narking dat	a delivered	l appropria	ately: 🗆 ye	es / $\square$ no		
Team le	eader signa	ture:					
Referee	signature:						

## FBM 2: Manipulation

Team name:			
Referee I:	, Refere	ee II: _	
Date and time:			
Notes:			
• The duration for ea	ach run is based on the r	eferee s	top watch.
• Timeout is checked duration.	d when the robot canno	ot grasp	the object within the specified test
• The sequence of ob	jects which are used in e	each run	is defined by the team.
v	id tray orange, EM-02= x type B, AX-02=bearin		x black, AX-01=bearing box type A, 03=axis, AX-09=motor
Run 1 Duration:	Timeout		
Object id:	, Orientation:	,	$\square$ Success, $\square$ Dropped, $\square$ Missed
Run 2 Duration:	□ Timeout		
Object id:	, Orientation:	,	$\square$ Success, $\square$ Dropped, $\square$ Missed
Comments:			
Run 3 Duration:	Timeout		
Object id:	, Orientation:	,	$\square$ Success, $\square$ Dropped, $\square$ Missed
Comments:			
Run 4 Duration:	□ Timeout		
Object id:	, Orientation:	,	$\Box$ Success, $\Box$ Dropped, $\Box$ Missed
Comments:			
Run 5 Duration:	□ Timeout		
Object id:	, Orientation:	,	$\square$ Success, $\square$ Dropped, $\square$ Missed
Comments:			

Run 6 Duration:	$\square$ Timeout	
Object id:	, Orientation:,	$\Box$ Success, $\Box$ Dropped, $\Box$ Missed
Comments:		
Run 7 Duration:		
Object id:	, Orientation:,	$\square$ Success, $\square$ Dropped, $\square$ Missed
Comments:		
Benchmarking data deliver	red appropriately: $\square$ yes	s / $\square$ no
Team leader signature:		
Referee signature:		

#### FBM 3: Control

Team name:	
Referee I:	, Referee II:
Date and time:	
Notes:	
• The duration for ea	ach run is based on the referee stop watch.
• Timeout is checked duration.	d when the robot cannot execute the path within the specified test
• The specific path for	or this benchmark is defined before the competition.
Run 1 Duration:	$\square$ Timeout, Finished complete path: $\square$ Yes $\square$ No
	, constant deviation:,
Run 2 Duration:	□ Timeout, Finished complete path: □ Yes □ No
area deviation:	, constant deviation:,
Comments:	
	□ Timeout, Finished complete path: □ Yes □ No, constant deviation:,
Comments:	
Run 4 Duration:	□ Timeout, Finished complete path: □ Yes □ No
area deviation:	, constant deviation:,
Comments:	
Run 5 Duration:	$\square$ Timeout, Finished complete path: $\square$ Yes $\square$ No
area deviation:	, constant deviation:,
Comments:	
_	elivered appropriately: $\square$ yes $/$ $\square$ no
	e:
Referee signature:	