

**ROBINSON HELICOPTER COMPANY
FLIGHT INSTRUCTOR SAFETY AND REFRESHER CLINIC**

Registration Form

(Please print clearly) - the information on this form is used to issue your course certificate. If you do not print clearly, your certificate may have errors!!)

Date:	<u>03-12-03</u>
Name:	<u>Chikao Takayanagi</u>
Address:	<u>Miami FL 33186</u>
Phone	
Dealer or Flight School Affiliation:	_____
Address:	_____

<u>Are you using this course to renew your CFI certificate? If yes, complete this portion.</u> (If you do not complete this portion you will not get the proper certificate to present to the FAA)	
Full Name:	<u>Chikao Takayanagi</u>
Mailing Address (if different from above):	_____ _____
CFI Certificate No.:	Date Issued: <u>06-07-01</u>

Certificates/Ratings (circle all those appropriate)

Private

Commercial

ATP

CFI

ASEL

ASEL

ASEL

ASEL

AMEL

AMEL

AMEL

AMEL

HEL

HEL

HEL

HEL

INST

Total Aircraft Hours

Airplane: 250 Helicopter: 5200 R22: 2000 R44: 10

Total Hours of Dual Instruction you have given (CFIs only!): 4800

INSTRUCTOR/PILOT EVALUATION

PILOT NAME CHICKAD TAKATANI

DATE 03-14-03

TOTAL TIME 5000

HELICOPTER 5000

R22 2000

R44 15

AS CFI 2000

☐ R22 FLIGHT

☒ R44 FLIGHT

HELICOPTER RATINGS HELD:

PVT

COMM.

CFI

ATP

MANEUVERS	PROFICIENCY					COMMENTS/RECOMMENDATIONS
	UNSATISFACTORY	BELOW AVERAGE	AVERAGE	ABOVE AVERAGE	EXCELLENT	
LOW RPM RECOVERY			X			
SETTLING W/POWER			X			
STRAIGHT AUTOS				X		Great control - nice recovery.
180° AUTOS				X		WAILED THESE
HOVERING AUTOS				X		GOOD
SIMULATED ENG OUT			X			
OVERALL HANDLING AND MANEUVERING				X		SMOOTH & SAFE.
ATTITUDE			X			
KNOWLEDGE			X			

GENERAL COMMENTS: 5th TIME AT SAFETY COURSE

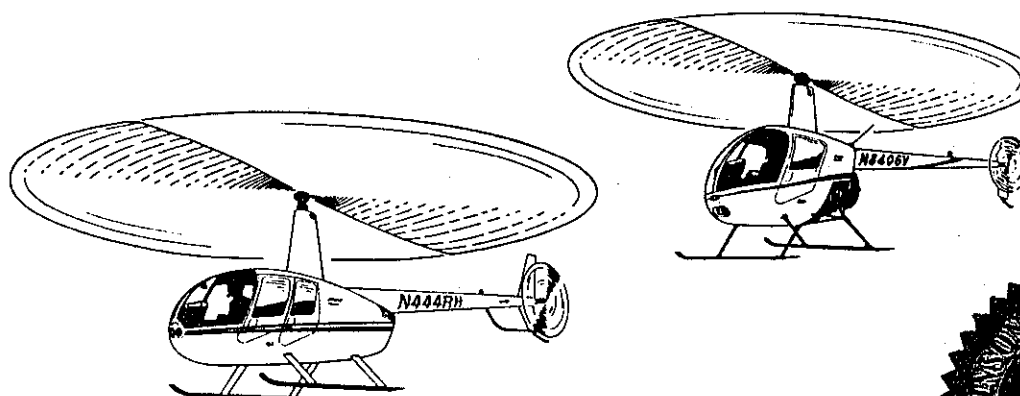
RHC INSTRUCTOR'S SIGNATURE

[Signature]

ROBINSON HELICOPTER COMPANY
FAA-APPROVED FLIGHT INSTRUCTOR REFRESHER CLINIC
CERTIFICATE OF GRADUATION

No 1190

CERTIFICATE
NUMBER



AWARDED TO:

Chikao Takayanagi

Miami, FL 33186



AWARDED BY: ROBINSON HELICOPTER COMPANY
2901 Airport Drive, Torrance, CA 90505 U.S.A.
On the 15th day of March, 2003

For the purpose of CFI Renewal, this certificate is valid for three calendar months from the date of issue.


TIMOTHY C. TUCKER, CHIEF INSTRUCTOR

R22/R44 MAINTENANCE COURSE SYLLABUS

Monday 0800-1130, 1230-1600:

- Principles of dynamic balancing
- Use of Chadwick-Helmuth Vibrex dynamic balance equipment
- RHC policies
- Maintenance publications & organization
- Periodic lubrication
- Handling, hoisting, leveling, weighing & CG calculation
- Fastener torque requirements
- Approved materials
- Part(hardware) interchangeability
- Actuator bearing inspection
- Push-pull tubes, spherical bearings, & rod end inspection
- Elastomeric bearing inspection
- Telatemp indicators
- Life-limited components & Airworthiness Limitations
- Overhaul requirements
- Type Certificate Data Sheet

Monday 1600-1700

Test

Tuesday 0800-1130 & 1230-1700

- Dynamic balance exercise
- Powerplant alignment
- Powerplant cooling system removal & installation
- Powerplant lubrication system
- Induction system
- Exhaust system
- MRGB removal, installllation, & leveling
- Rotor RPM sender adjustment
- MRGB seal replacement
- MRGB overtemp inspection
- MRGB chip light inspection
- Clutch assy removal, servicing, installation, & alignment
- Drive belt removal, installation, & adjustment
- TR driveshaft removal, installation, & runout check
- TRGB removal and installation
- TRGB chip light inspection
- Belt tension actuator adjustment
- Actuator electro-mechanical functions
- Rotor brake adjustment

RECEIVED

NOV 01 2004

NTSB MIAMI

R22/R44 MAINTENANCE COURSE SYLLABUS (cont'd)

Wednesday 0800-1130

- Dynamic balance exercise
- Cyclic lateral trim adjustment
- Cyclic longitudinal trim adjustment
- Cyclic friction adjustment
- A121-7 push-pull tube guide replacement
- Collective trim adjustment
- Collective friction adjustment
- Governor system
- Swashplate friction adjustment
- A203 yoke & A205 fork assemblies(scissors) bearing replacement
- MR removal
- MR hub installation & teeter hinge friction adjustment
- MR installation & coning hinge friction adjustment
- MR blade inspection and repair
- U.S. FAA AD 88-26-01 R2 compliance
- TR hub bearing replacement
- TR blade inspection and repair

Wednesday 1230-1600

Practical exercises in hangar per TASK sheet

Wednesday 1600-1700

Test

Thursday 0800-1200

- Dynamic balance exercise
- MR track and balance equipment installation
- MR pitch link adjustment
- MR head shift
- MR trim tab adjustment
- TR balancing equipment installation
- Autorotation RPM check and adjustment
- Exhaust heat exchanger inspection
- Fuel tank inspection and repair
- Fuel tank sump drain removal and installation
- Fuel quantity system calibration
- Fuel flow check
- Low fuel sender check
- Gascolator inspection

Thursday 1230-1600

Practical exercises in hangar per TASK sheet

Thursday 1600-1700

Test

R22/R44 MAINTENANCE COURSE SYLLABUS (cont'd)

Friday 0800-1130

- Dynamic balance exercise
- Pitot-static system leak check
- MAP system leak check
- Instrument calibration checks
- Tachometer adjustment
- Low rotor RPM warning unit adjustment
- Battery servicing
- Starting system troubleshooting
- Belt tension actuator troubleshooting

Friday 1230-1600

- Practical exercises in hangar per TASK sheet

Friday 1600-1700

- Test

Monday 0800-1130

- Windshield replacement
- Welded steel tube frame removal, repair, & installation
- Tailcone removal, repair, and installation
- Empennage removal and installation
- Landing gear removal and installation
- Landing gear cross tube replacement
- Landing gear preventative maintenance
- Float gear removal and installation
- 100-hour/annual inspection
- Special inspections
- 12-year inspection and limited overhaul

Monday 1230-1600

- Practical exercises in hangar per TASK sheet

Monday 1600-1700

- Test

Tuesday 0800-1130

- R44 differences
- R44 electric trim system
- R44 hydraulic system servicing

Tuesday 1230-1700

- Complete any unfinished TASK sheet exercises in hangar

Wednesday 0800-1130

- Review

Wednesday 1230-1700

- R22 helicopter track & balance exercise

R22/R44 Maintenance Course Student Task List

(Do NOT lose! No list = no certificate!)

Refer to appropriate manufacturers' publications (provided).
Instructor to initial sequences marked "Instructor".

TASK 1 - Powerplant

- ☒ Remove both magnetos from engine on stand.
- ☒ Remove point covers from both magnetos and loosen all point retaining screws.
- ☒ Perform magneto timing procedure per section 9.2.9 of TCM System Support Manual for S-20/S-200 Series High Tension Magnetos. Do NOT exceed specified torques.
- ☒ INSTRUCTOR to verify proper point gap and timing.
- ☒ Check magneto operation on test test
- ☒ Install, time, & synchronize magnetos to engine.
- ☒ INSTRUCTOR to verify magneto timing & synchronization.

Task 2 - Powerplant

- ☒ Perform Lycoming SB 388B on cylinder as directed.
- ☒ INSTRUCTOR to witness valve stem-to-guide clearance.
- ☒ INSTRUCTOR to witness dry tappet clearance check.
- ☒ Remove A051-1 actuator per section 7.510.
- ☒ Remove A181-4 lower bearing's housing (remove 4 nuts)
- ☒ Inspect lower actuator bearing. Verify smooth operation and no dryness or roughness.
- ☒ Install lower actuator bearing housing. Ensure seals are aligned properly. Torque screws per section 1:320.
- ☒ Install A051-1 actuator per section 7.520.
- ☒ INSTRUCTOR to inspect completed assembly.

Task 3 - Airframe: R22 Flight Control Simulator

- ☒ Remove MR blades per MM sec 9.111.
- ☒ Remove MR hub per sec 9.121.
- ☒ Remove swashplate per sec 8.411.
- ☒ Remove inner row of screws from swashplate. Remove swashplate ball and hand instructor the A209 shim.
- ☒ Shim swashplate per sec 8.416.
- ☒ Install swashplate per sec 8.412.
- ☒ Install MR hub per sec 9.123.a. and adjust teeter hinge friction per 9.124(b)
- ☒ INSTRUCTOR to witness teeter hinge friction.
- ☒ Install MR blades per 9.123.b. using new bolts & nuts. When drilling bolts, do NOT let chips fall into hub area; tape masking paper around nuts to catch chips.
- ☒ Install magnetic pickup bracket per sec. 10.221(b & c).
- ☒ INSTRUCTOR to inspect completed assembly.
- ☒ Bend trim tab on practice MR blade as directed by instructor.

Task 4 - Airframe: R22 Classroom Practice Helicopter

- ☒ Remove A018 clutch assy per section 7.210
- ☒ Remove A184-3 bearing per section 7.211.
- ☒ Remove aft clutch seal retaining plate and service with fluid per section 7.213. (OVER)

ROBINSON
HELICOPTER COMPANY

Page 2 of 2

2901 Airport Drive, Torrance, California 90505

Phone (310) 539-0508 Fax (310) 539-5198

- ✓ Install clutch per section 7.220 steps 1. thru 6. (do NOT install intermediate flexplate at this time).
- ✓ Adjust clutch sheave alignment per sec 7.230 & record:
engine height: 3.6 inches
sheave alignment Left gap: 0.20 ; Right gap: 0.20
throttle correlation rigging 4.000 inch
clutch shaft angle 3.5 degrees
- IN. INSTRUCTOR to verify above
- ✓ Install intermediate flexplate per sec 7.330.
- ✓ Perform tail rotor drive shaft (if installed) run out check per section 7.340 & record results:
Aft hole Next fwd hole Next fwd hole Forward hole
0.08 in. 0.05 in. 0.04 in. 0.02 in.
- ✓ Perform R22 MM Section 2.410 item 8, Method 2 actuator check.
- IN. INSTRUCTOR to inspect above & initial.

Task 5 - Airframe: R22 Classroom Practice Helicopter

- ✓ Inspect TR pitch control bearings per R22 SB-90
- ✓ Remove tail rotor per R22 MM section 9.210.
- ✓ Remove tail rotor pitch control per section 8.561.
- ✓ Check TRGB output shaft for damage.
- ✓ Install TR pitch control per section 8.562.
- ✓ Replace TR hub bearings per sections 9.214 and 9.215.
- ✓ Install TR per section 9.213.
- ✓ Install TR balancing equipment per section 10.222.
- IN. INSTRUCTOR to inspect assembly.
- ✓ Perform AD 88-26-01 R2 spindle inspection on a MR blade.
NOTE: Apply dye penetrant to spindle using cotton swab; do not SPRAY penetrant on spindle (overspray stains floor).
- ✓ Remove one MR blade boot outer clamp. NOTE: Drain fluid into white plastic container before loosening boot clamp
- ✓ Install MR blade boot per sec 9.114 & service per 9.115
- IN. INSTRUCTOR to inspect above & initial.

Task 6 - Airframe: R44 Flight Control Simulators & MRGB

- ✓ Remove lateral trim actuator per R44 MM section 8.141 (covers have already been removed & friction knob may remain in place).
- ✓ Install lateral trim actuator per section 8.142.
- ✓ Adjust trim system balance per section 14.710.
- IN. INSTRUCTOR to inspect assembly & initial.
- ✓ Replace hydraulic filter per R44 MM section 1.160. Adjust reservoir fluid level as required.
- ✓ Inspect hydraulic filter (cut off ends & expand element)
- ✓ Bleed hydraulic system per R44 MM section 1.180.
- ✓ Inspect landing gear float per Section 2.580
- ✓ Remove R44 MR spindles & MR hub from MRGB
- ✓ Remove & reinstall 1 each R44 MR hub teeter & coning hinge bearing per Section 9.126
- ✓ Install MR hub onto MRGB per Section 9.123.
- IN. Instructor to witness teeter hinge friction
- IN. Install MR blades (spindle portion only) per 9.123.b.
- IN. INSTRUCTOR to inspect above & initial.

R22/R44 MAINTENANCE COURSE - OCTOBER 20-29, 2003

Bob 4 J.C.

Mervin Brent 5 Ron Bruno 1

2 Kavan Jeff Gus 1140 Rob owner

Gerhard Richard 3 Jairo Steve Baxter

Cert #	1N1	1.2	2.1	3.6	4.6	6.0		
	-6	-0	-0	-0	-0	-0	Baxter, Steven	-1 (Maryland) B234
	-8	-6	-2	-0	-0	-2	Becerra, Jairo W.	-3 Helicenter International Academy (Florida)
	-4	-1	-1	-3	-1	-1	Bissonnette, Ronald	-1 Transport Canada (Quebec)
	-9	-2	-2	-0	-0	-2	Glick, Mervin	-0 Virginia Helicopter Sales/Service (Virginia)
	-9	-1	-2	-1	-0	-1	Haas, Richard	-2 Granite Mountain Aviation (Arizona)
	-6	-0	-2	-1	-0	-1	Hayward, Kavan	✓ -1 Airborne Energy Solutions (Alberta)
	-6	-5	-3	-0	-0	-5	Helm, Gerhard	-1 Heli-Frankonia Helicopter (Germany)
	-3	-2	-0	-0	-1	-0	Housel, James	-1 Westair Aviation (Maryland)
	-10	-2	-0	-1	-0	-1	Huston, Brent	✓ -1 Silverhawk Aviation (Idaho)
	-7	-1	-0	-0	-0	-0	Hutchison, Robert	-0 (Maryland)
	-5	-0	-0	-0	-0	-3	Jamison, Gustav	-1 (North Carolina) -
	-6	-2	-0	-0	-0	-3	Nagy, Jeffrey	✓ -1 Frontline Helicopter Support (SK, Canada)
	-8	-1	-1	-2	-0	-2	Picard, Bruno	-2 Transport Canada (Quebec)
	-7	-4	-2	-1	-0	-4	Springer, Robert	✓ -2 Verticare (California)

14 | -94

6.7 correct
39%

ROBINSON HELICOPTER COMPANY

2901 Airport Drive, Torrance, California 90505

Name :

George Interian 1 of 2
MAY 04

Phone (310) 539-0508 Fax (310) 539-5198

R22/R44 Maintenance Course Student Task Checklist

(Do NOT lose! No checklist = no certificate!)

Refer to appropriate manufacturers' publications (provided).
Instructor to initial sequences marked "Instructor".

TASK 1 - Powerplant

- ☒ Remove both magnetos from engine on stand.
- ☒ Remove point covers from both magnetos and loosen all point retaining screws.
- ☒ Perform magneto timing procedure per section 9.2.9 of TCM System Support Manual for S-20/S-200 Series High Tension Magnetos. Do NOT exceed specified torques.
- ☒ **INSTRUCTOR** to verify proper point gap and timing.
- ☒ Check magneto operation on test test
- ☒ Install, time, & synchronize magnetos to engine.
- ☒ **INSTRUCTOR** to verify magneto timing & synchronization.
- ☒ Perform Lycoming SB 388B on cylinder as directed.
- ☒ **INSTRUCTOR** to witness valve stem-to-guide clearance.
- ☒ **INSTRUCTOR** to witness dry tappet clearance check.

Task 2 - Powerplant

- ☒ Remove A051-1 actuator per section 7.510.
- ☒ Remove A181-4 lower bearing's housing (remove 4 nuts)
- ☒ Inspect lower actuator bearing. Verify smooth operation and no dryness or roughness.
- ☒ Install lower actuator bearing housing. Ensure seals are aligned properly. Torque screws per section 1.320.
- ☒ Install A051-1 actuator per section 7.520.
- ☒ **INSTRUCTOR** to inspect completed assembly.
- ☒ Remove C184-2 bearing assy per section 7.211.
- ☒ Remove aft clutch seal retaining plate and service with fluid per section 7.213.
- ☒ Install C184-2 bearing assy per sec 7.212.

Task 3 - Airframe: R22 Flight Control Simulator

- ☒ Remove MR blades per MM sec 9.111.
- ☒ Remove MR hub per sec 9.121.
- ☒ Remove swashplate per sec 8.411.
- ☒ Remove inner row of screws from swashplate. Remove swashplate ball and hand instructor the A209 shim.
- ☒ Shim swashplate per sec 8.416.
- ☒ Install swashplate per sec 8.412.
- ☒ Install MR hub per sec 9.123.a. and adjust teeter hinge friction per 9.124(b)
- ☒ **INSTRUCTOR** to witness teeter hinge friction.
- ☒ Install MR blades per 9.123.b. using new bolts & nuts. When drilling bolts, do NOT let chips fall into hub area; tape masking paper around nuts to catch chips.
- ☒ Install magnetic pickup bracket per sec. 10.221(b & c).
- ☒ **INSTRUCTOR** to inspect completed assembly.
- ☒ Bend trim tab on practice MR blade as directed by instructor.

Task 4 - Airframe: R22 Classroom Practice Helicopter

- ☒ Remove A018 clutch assy per section 7.210
- ☒ Install specified clutch per section 7.220 steps 1. thru 6. (do NOT install intermediate flexplate at this time).
- ☒ Adjust clutch sheave alignment per sec 7.230 & record:
engine height: within 4 1/2 inches
sheave alignment Left gap: .060; Right gap: .044
throttle correlation rigging .025 inch
clutch shaft angle 3.5° degrees
- ☒ INSTRUCTOR to verify above
- ☒ Install intermediate flexplate per sec 7.330.
- ☒ Perform tail rotor drive shaft (if installed) run out check per section 7.340 & record results:
Aft hole Next fwd hole Next fwd hole Forward hole
.010 in. .008 in. .006 in. .007 in.
- ☒ Perform R22 MM Section 2.410 item 8, Method 2 actuator check.

INSTRUCTOR to inspect above & initial.

Task 5 - Airframe: R22 Classroom Practice Helicopter

- ☒ Inspect TR pitch control bearings per R22 SB-90
- ☒ Remove tail rotor per R22 MM section 9.210.
- ☒ Remove tail rotor pitch control per section 8.561.
- ☒ Check TRGB output shaft for damage.
- ☒ Install TR pitch control per section 8.562.
- ☒ Replace TR hub bearings per sections 9.214 and 9.215.
- ☒ Install TR per section 9.213.
- ☒ Install TR balancing equipment per section 10.222.
- ☒ INSTRUCTOR to inspect assembly.
- ☒ Perform AD 88-26-01 R2 spindle inspection on a MR blade.
NOTE: Apply dye penetrant to spindle using cotton swab; do not SPRAY penetrant on spindle (overspray stains floor).
- ☒ Remove one MR blade boot outer clamp. NOTE: Drain fluid into white plastic container before loosening boot clamp
- ☒ Install MR blade boot per sec 9.114 & service per 9.115
- ☒ INSTRUCTOR to inspect above & initial.

Task 6 - Airframe: R44 Flight Control Simulators & MRGB

- ☒ Remove lateral trim actuator per R44 MM section 8.141 (covers have already been removed & friction knob may remain in place).
- ☒ Install lateral trim actuator per section 8.142.
- ☒ Adjust trim system balance per section 14.710.
- ☒ INSTRUCTOR to inspect assembly & initial.
- ☒ Replace hydraulic filter per R44 MM section 1.160. Adjust reservoir fluid level as required.
- ☒ Inspect hydraulic filter (cut off ends & expand element)
- ☒ Bleed hydraulic system per R44 MM section 1.180.
- ☒ Inspect landing gear float per Section 2.580
- ☒ Remove R44 MR spindles & MR hub from MRGB
- ☒ Remove & reinstall 1 each R44 MR hub teeter & coning hinge bearing per Section 9.126
- ☒ Install MR hub onto MRGB per Section 9.123.
- ☒ Instructor to witness teeter hinge friction
- ☒ Install MR blades (spindle portion only) per 9.123.b.
- ☒ INSTRUCTOR to inspect above & initial.

Initial (does not count toward passing)

R22/R44 MAINTENANCE COURSE - JUNE 21 - JULY 1, 2004

George 14y
Grant 8y
Aaron 12y
Brad 4y
Romik 3y
Miguel 1y
Joe
Don
James
Julio 4369
Dallas
Ray
John T.

Initial	1.2	2.2	3.2	4.8	Test Scores
-7	-1	-0	-1	-2	-1
-7	-0	-0	-0	-3	-3
-7	-0	-0	-1	-3	-3
-11	-1	-0	-1	-1	-4
-8	-6	-0	-1	-3	-1
-7	-3	-0		-1	-1
-8	-1	-0	-1	-3	-2
-7	-0	-0	-1	-2	-2
-5	-0	-0	-1	-1	-0
-7	-1	-0	-1	-1	-1
-6	-0	-0	-1	-2	-2
-9	-0	-0	-1	-2	-3
-10	-0	-0	-0	-2	-4

Ashbaugh, Aaron 12y FW	Airplane Medic (Arizona)
Fekete, Grant 8y helo	--- (Alberta, Canada)
Guerrero, Julio Alfredo	Policia Nacional Civil (El Salvador)
Honarchian, Romik little helo	International Business Air (Sweden) - AUDIT ONLY
Interian, George 20y/1y R22	--- (Florida)
King, Dallas R22 1.5mo.	Silver State Helicopters (Arizona)
Marroquin, Joe 8yr,	--- (Texas)
Greeno, James	Universal Helicopters (Colorado) Jeffco
McDanold, Brad helo	Felts Field Aviation (Washington)
McInnes, Donald 30y, 12-R22	Wakatipu Aviation (Queenstown, New Zealand)
McNeal, Raymond Pilot.	Kansas Copters/Schreib-Air (Kansas)
Miranda, Miguel Ernesto	Policia Nacional Civil (El Salvador)
Tracy, Johnny Pilot R22	--- (Missouri) STL

B -99
-7.6
AVG 30.7%