



REMOTE CONTROL MACHINE, TRANSMITTER & RECEIVER **SERVICING**

BY THE ORIGINAL EQUIPMENT MANUFACTURER



Remote Control Technologies Pty Ltd (RCT) is the Original Equipment Manufacturer (OEM) for the **Control Master®** brand of remote control mining equipment. RCT takes pride in providing quality and durable products that meet the requirements of today's mining environment.

Control Master®

**CONTROL & AUTOMATION
SYSTEMS**

www.rct.net.au



On site remote machine servicing

Remote Control Technologies (RCT) offers **Control Master®** on site Remote, Teleremote and Automation control machine systems auditing and servicing. Our **Control Master®** service programs are designed for the purpose of providing operational checks and preventative maintenance servicing to reduce the risk of equipment malfunction during vital production periods.

Regular preventative maintenance is essential to keep your **Control Master®** products operating in a safe reliable manner. RCT has a dedicated team of qualified customer service personnel, trained to provide maintenance services for your **Control Master®** Remote Control systems fitted to your machines. The RCT service teams are continuously trained and advised of product updates and developments. Remote services should only be carried out by RCT - the OEM.

As the OEM, RCT delivers a structured servicing program of operational checks and preventative maintenance. The recommended servicing schedule shown below outlines the frequency of services and who should perform the services. RCT recommends remote machine services are performed every 3 months or 1500 machine hours only by RCT. Following the recommended servicing ensures compliance with section G5.1 of AS/NZS 4240:1994. Your operational and maintenance personnel must be fully aware of and complete all other requirements set out in AS/NZS 4240:1994 for full compliance (refer to your relevant State Mining Act & Regulations for any other necessary compliance).

RCT schedule a team to perform regular maintenance service of your remote control machines and equipment at scheduled intervals to ensure the remote control equipment remain in safe operating condition, adhering to RCT OEM recommendations and AS/NZS 4240:1994 standards for remote control for mining equipment.

An important part of the RCT **Control Master®** Service program is to provide comprehensive service documentation to allow you to keep detailed records of servicing and provide traceability for maintenance planning and repair diagnostics. RCT see this as a crucial tool in the event that proof of servicing and maintenance is required.



RCT RECOMMENDED SERVICING SCHEDULE

- (1) Trained to RCT course level 1 line of sight safe operating procedures and level 1 Teleremote safe operating procedures.
- (1 & 2) trained to RCT courses above plus level 2 line of sight safe testing procedures and level 2 Teleremote safe testing procedures.
- (1, 2 & 3) trained to RCT courses above plus level 3 Teleremote communications systems.

OPERATION	FREQUENCY	PERFORMED BY	RCT PROVIDE
Machine Remote Pre-start	Prior to operating the machine on remote control	Client Operator (1)	Check Sheet Template
Remote Function Test	Every 2 weeks or 250 machine hours	Client Maintenance Technician (1)	Check Sheet Template
Remote Machine/Teleremote Service	Every month or 500 machine hours	Client Maintenance Technician (1&2)	Service Report Template
Teleremote Control Station Service	Every month or 500 machine hours	Client Maintenance Technician (1, 2 & 3)	Service Report Template
OEM Remote Machine/Teleremote Service	Every 3 months or 1500 machine hours	Authorised and Trained RCT Service Technician	Combined Service Report
OEM Transmitter/Receiver Service	Every 6 months or 3000 machine hours	Authorised and Trained RCT Service Technician	Combined Service Report

EXAMPLES OF MACHINE SERVICE REPORTS

1500 HOUR / THREE MONTHLY MACHINE REMOTE / TELEREMOTE SERVICE

SERVICE FOR: LINE OF SIGHT (SECTIONS 1-5) TELEREMOTE MACHINE (SECTIONS 1-4)

Company	Work Order No.
Site	Machine serial No.
Machine Type	Machine Hours
Plant Number	Remote Hours
CM Unit No.	Remote Hours

⚠️ THE FOLLOWING SERVICE MUST BE COMPLETED IN FULL

⚠️ ENSURE THE MACHINE IS CORRECTLY ISOLATED PRIOR TO STARTING SERVICE

1. SERVICE RECORDS INSPECTION

ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Service records	Files in service folder of the machine	<input checked="" type="checkbox"/>		
	Been conducted at correct intervals	<input checked="" type="checkbox"/>		
	Review any reported faults	<input checked="" type="checkbox"/>		
	Verify correct machine TX/RX allocation	<input checked="" type="checkbox"/>		
	Last bench service date for TX/RX was	<input checked="" type="checkbox"/>		5-2-09

2. VISUAL INSPECTION OF: (Check for corrosion, wear & tear, damage, leaks, arcing, tightness of screws/bolts or any other cause for failure)

ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Implement	Wiring - Plugs & coils	<input checked="" type="checkbox"/>		exposed coils
	Hydraulic	<input checked="" type="checkbox"/>		
	Mountings	<input checked="" type="checkbox"/>		
	Fittings	<input checked="" type="checkbox"/>		

ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Receiver (Internal)	Mounting frame (bolts & rubbers)	<input checked="" type="checkbox"/>		missing rubber
	Electrical plugs (Swaged from environment)	<input checked="" type="checkbox"/>		
	Aerial fittings (Swaged from environment)	<input checked="" type="checkbox"/>		
	Enclosure	<input checked="" type="checkbox"/>		
	Ensure components are secure	<input checked="" type="checkbox"/>		camera washers faulty
	Inspect fit seal	<input checked="" type="checkbox"/>		
	Inspect electrical plugs	<input checked="" type="checkbox"/>		
	Change vapor capsule	<input checked="" type="checkbox"/>		

ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Transmitter (Internal)	Carry frame	<input checked="" type="checkbox"/>		
	Joysticks (shoes, shafts & handles)	<input checked="" type="checkbox"/>		cracked LRT boot
	Control switches (operation & body)	<input checked="" type="checkbox"/>		deteriorated boots
	Electrical plugs	<input checked="" type="checkbox"/>		
	Enclosure	<input checked="" type="checkbox"/>		
	Ensure components are secure	<input checked="" type="checkbox"/>		
	Inspect fit seal	<input checked="" type="checkbox"/>		
	Inspect electrical plugs	<input checked="" type="checkbox"/>		
	Change vapor capsule	<input checked="" type="checkbox"/>		

ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Transmitter battery	Lead & plug	<input checked="" type="checkbox"/>		
	Condition of battery	<input checked="" type="checkbox"/>		flat battery
Battery charger	Condition and operation	<input checked="" type="checkbox"/>		

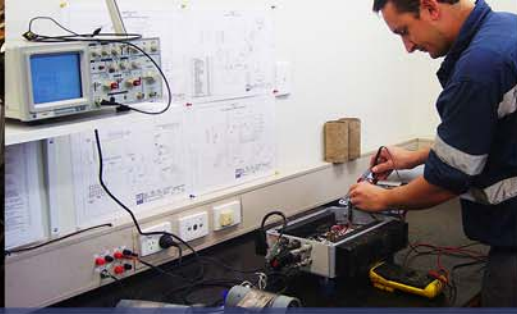
ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Lead TX to electrical interface	Cable condition	<input checked="" type="checkbox"/>		rubbed through
	Plugs - tightness	<input checked="" type="checkbox"/>		
	Swaged from environment	<input checked="" type="checkbox"/>		

ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Camera	Open camera, check connection	<input checked="" type="checkbox"/>		
	Ensure components are clean & dry	<input checked="" type="checkbox"/>		
	Camera mounts (inspect & clean)	<input checked="" type="checkbox"/>		
	Check tightness of bolts	<input checked="" type="checkbox"/>		both loose
	Seal all plugs from environment	<input checked="" type="checkbox"/>		
	Inspect and test	<input checked="" type="checkbox"/>		missing
	Seal all connections from environment	<input checked="" type="checkbox"/>		

ITEM	DESCRIPTION	OK	INITIAL	COMMENTS
Teleremote System (Remote operator)	All camera pictures (Check alignment)	<input checked="" type="checkbox"/>		
	Teleremote lighting	<input checked="" type="checkbox"/>		

Service Notes:

- Implement coils are seized to the spools. Replaced two coils and spools.
- Push button coil has high resistance, replaced as required.
- Shooting valve dip plug is full of water and corrosion, vapour spring and replaced plug.
- Replaced interface plug seals - no-tighten interface mounting bolts & clean city residue from inside interface enclosure.
- Replace rubber suction cup mounts on receiver, replace camera washers on receiver processor mount.
- Replaced cracked wireless joystick boot and all 4 control switch boots.
- Repair near Teleremote lighting and replace low hydrolytic oil switch.
- Replace to interface boom (Rubbed through on articulation locking pins, replaced).
- Transmitter battery is faulty (need new one to be ordered). It does not hold charge.
- Repair open circuit in fire suppression wiring.
- Repair open circuit in front camera harness.



Remote Control Transmitter & Receiver Servicing

As with the machine servicing, RCT recommends the regular servicing of **Control Master®** Transmitters and Receivers.

Our **Control Master®** service program for transmitter and receiver is designed to provide operational checks and preventative maintenance servicing to reduce the risk of equipment malfunction during vital production periods and to ensure units are operating in a safe and reliable manner.

RCT has a dedicated team of suitably qualified customer service personnel trained to service and repair transmitter and receiver units. The training RCT's customer service personnel receives is continuously updated to ensure changes in new technology is fully understood. This can only be effectively carried out by RCT - the OEM.

RCT recommends that the transmitters and receivers should be serviced every 3000 hours or six monthly. This service is performed at RCT service centres. Remote hire sets are available to ensure the machine can still be operated.

BENEFITS

- ▶ Comply with remote operation standard AS/NZS 4240:1994.
- ▶ Comply with OEM recommended service schedules.
- ▶ Preventative maintenance will reduce machine downtime and repair costs.
- ▶ Assist site maintenance teams to gain product knowledge through regular visits and contact with RCT technicians.
- ▶ Assist in ensuring your responsibility to have remote systems operating in a safe and reliable manner.
- ▶ Ensuring all machine remote control components are in good working order will help reduce incorrect fault diagnosis of remote transmitter and receiver units.
- ▶ Documentation on completion of service supplied to client for site records .



EXAMPLES OF TRANSMITTER & RECEIVER SERVICE REPORTS

SERVICE REPORT	
CM393D (Previously serviced 10/06/2009)	Date : 7/04/2009
Customer :	CM Model :
Reason for return to RCT :	
Displaying a disparity code	
Reported Faults :	
Code 62	
Faults Found :	
Tx enclosure badly cracked.	
Update on labels.	
Upgrade security screws.	
Service and clean req.	
Upgrades / Modifications Required :	
Nil	
Work Completed :	
Rebuilt tx with new enclosure. Fill cober spec lexan and replaced joystick switch boots, startfire flip covers and rubber buffers.	
Carried out full service and clean.	
Tested tx and rx functions. Test ok	
Fit new style security screws.	
Update tx and rx on labels.	
Replaced vapour capsuled and sealed enclosures.	
Warranty :	No
Technician :	Petar Stelick Job No : 17378
Checked By :	Sean Coffey Parent No :
Next Service Due :	4/10/2009 Quote No :
Machine Hours :	Remote Hours :

SERVICE CHECKS			
RADIO			
Frequency :	471.750 MHz		
TRANSMITTER		RECEIVER	
Power@12v :	1.3 W	Power@24v :	1.5 W
Deviation :	(in spec?) Yes	Deviation :	(in spec?) Yes
RX Audio Output :	(in spec?) Yes	RX Audio Output :	(in spec?) Yes
Tx Radio Serial No :	020900271	Rx Radio Serial No :	030100518
Tx Radio Model :	MAXON SD-125 US	Rx Radio Model :	MAXON SD-125 US
OTHER CHECKS			
All Outputs :	(in spec?) Yes	Disparity Tested :	(in spec?) Yes
Tilt Switch :	(in spec?) Yes	SV Throttle :	(in spec?) N/A
External Joystick :	(in spec?) Yes	Sonalert :	(in spec?) N/A
Barrier Sense :	(in spec?) Yes		
TRANSMITTER		RECEIVER	
Tx EPROM Ver :	2.07.12	Rx EPROM Ver :	2.07.12T
Current Draw@12v :	(in spec?) Yes	Disparity EPROM Ver :	1.13
Low Battery Signal :	(in spec?) Yes	Current Draw@24v :	(in spec?) Yes
		Low Voltage Signal :	(in spec?) Yes

OPTIONS AND ADDRESS			
TRANSMITTER			
24 23 22 21 20 19 18 17 [X] [] [] [] [] [] [] []	8 7 6 5 4 3 2 1 [] [] [] [X] [] [X] [X] []		
8 7 6 5 4 3 2 1 [X] [] [] [] [] [X] [] []	16 15 14 13 12 11 10 9 [] [] [] [] [] [] [] []		
ADDRESS >			
RECEIVER			
1 2 3 4 5 6 7 8 [] [] [] [] [] [] [] []	17 16 19 20 21 22 23 24 [] [] [] [] [] [] [] []		
9 10 11 12 13 14 15 16 [] [] [] [] [] [] [] []	1 2 3 4 5 6 7 8 [] [] [X] [] [] [] [] []		
ADDRESS >			
DISPARITY			
1 2 3 4 5 6 7 8 [] [] [] [] [] [] [] []			
ENGINE MONITORING - Functions; Enabled at time of servicing.			
Digital	Analogue		
Engine Oil Low Pressure	No Analogue Functions Specified		
Engine High Temperature			
Engine Low Coolant			
Hydraulic Oil Low Level			
PWM SETTINGS			
MIN	MAX	MIN	MAX
FORWARD	10 % 90 %	RAISE	10 % 90 %

SAFETY SHOULD NEVER BE QUESTIONED



SERVICING

REMOTE CONTROL EQUIPMENT

INTERNATIONAL SERVICE PROVIDER NETWORK:

RCT has a service provider network in many countries aimed at providing local support to customers. These service providers have been trained by RCT to confidently service all RCT products and equipment. RCT will also mobilise our own customer service personnel at the customer's request.

NOTE: RCT will service any RCT products at the customer's request.



www.rct.net.au
sales@rct.net.au

Remote Control Technologies Pty Ltd

PERTH HEAD OFFICE

Unit 2-5/511 Abernethy Road, Kewdale WA 6105
Ph: +61 8 9353 6577 Fax: +61 8 9353 6578

KALGOORLIE

24 Percy Road, Kalgoorlie WA 6430
Ph: +61 8 9021 1600 Fax: +61 8 9091 4927

MT ISA

1A Ryan Road, Mt Isa QLD 4825
Ph: +61 7 4749 0233 Fax: +61 7 4749 0232