TOGGLE STYLE CONTROLLER

PRODUCT DATA AND SPECIFICATIONS

INTRODUCTION - Designed specifically for rough heavy duty applications, the T01 toggle style radio remote controller is ideal for steel mill, steel service center and other severe industrial applications. Its functional operation is customized to duplicate the operating characteristics of the controls most commonly found in crane and locomotive cabs. Therefore the change from manual to radio control is easily learned by operators. This controller has a sophisticated electronics circuit board using micro-computer digital circuitry. It is protected by a sturdy thick-walled, anodized aluminum housing with specially designed tough rubber endcaps. Extensive use of seals and gaskets provides all weather protection for the electronics circuit board which uses industrial rated digital components, a powerful micro-computer and flexible operating software code.

Some significant performance and safety features:

POWER ON SELF TEST DIAGNOSTICS - When the operator first turns the power switch on, a sophisticated self-test routine tests the microcomputer and input integrated circuits to detect a failure. Any optional paddle style switches are tested for neutral at this time. A small speaker beeps twice when the test is complete & all is okay.

FAILURE MESSAGE - If a motion function switch circuitry failure occurs, it is recognized as a problem and “locked out” from any further input. A special message is sent to the receiver/decoder to advise maintenance personnel of the problem. The message is both displayed and stored in the datalog of the Cattron 864 decoder.

TOGGLE SWITCH PLACEMENT - Each layout is customized according to user needs. The levers are placed far enough apart to accommodate operators who wear heavy gloves.

TRANSMIT/BATTERY CHARGE INDICATOR - The low battery detection circuit is a two stage design. With a good battery, this indicating light flashes green for each burst of transmitted data. If the battery voltage drops below the normal level, this LED flashes red during each transmission. A beeping sound every 10 seconds alerts the operator. When this happens, the battery has approximately one hour of operating time remaining. The controller stops transmitting before the voltage drops so low that erratic operation could occur. An optional charging jack allows battery recharging without battery removal.

BATTERY OPTIONS - AA alkaline batteries, alkaline packs, NICAD and mercury batteries are available. Whether you choose rechargeable or disposable batteries, changing the battery is easy - simply open the gasketed battery cover, drop the battery in place and close the cover. There are no wires or connectors to insert into the battery, which improves long-term reliability of this unit.

SAFETY BAR - A full length safety bar is provided to function as an enable device to all motion switches. It is a large full-length switch that is easily and naturally activated by the thumb or palm of the operator's hand any time he places his hand into position to move the motion switches. This push-to-operate (PTO) safety bar electronically disconnects all motion switches when it is released, thus stopping motion commands from' these switches. This feature is programmable. Certain applications may have some switches removed from control of the PTO bar. An example of this is the brake function of a locomotive.

RUGGED HOUSING - The housing that surrounds and protects the electronic circuitry is a thick-walled extruded aluminum, which has a hard anodized exterior. The ends of the housing are rubber coated plates that make shock absorbing end 'bumpers" which shield the toggle switches.

DURABLE/OUTDOOR OPERATION - The toggle switches are extremely long lived units that are sealed, providing water and dust protection. All modules and sub-components are gasketed, making this unit suitable for outdoor operation in rain and snow.

ADDITIONAL EMERGENCY STOP - An optional tilt switch is available with this model. If the controller is tilted in any axis beyond 451 of upright for longer than the programmed time (typically 5 seconds), a programmable function is sent automatically. This function can be assigned in the decoder to stop the equipment, sound an alarm, or both. Reset time is also programmable.

FREQUENCY OF OPERATION - The RF transmitter built in this model allows operation in the 450-470 MHz band on licensed radio channels. All models in the 450-470 MHz range are synthesized (16 frequency max).

APPLICATIONS - The T01 toggle type control unit can operate any digital Cattron Series receiver/decoder built by Cattron Incorporated. It can be used with existing systems as a replacement or as an extra transmitter/encoder.

STANDARD SPECIFICATIONS

Case Material ..... Anodized Aluminum Extrusion with Molded Rubber End Caps

Weight..... 3 lbs. (1. 1 Kgs), (1 2 Toggle Unit) Including Battery Pack

Dimensions..... Height: 9.75 in. (25.0 cm) Depth: 4 in. (1 0.0 cm)

Width: 3.75 in. (9.5 cm)

Environmental..... -4° F to + 140° F (-20° C to + 60° C),

RH 0 to 95% Non-condensing

Number of Functions..... 40 On/Off (space permitting) or 2 Analog with 30 On/Off max.

Switch Type..... Spring Return to Center, Maintained, Pushbutton, Rotary Select, etc.

Lever Switch Choices..... Detented (5 Steps Each Side of Center) or Stepless (Analog)

(2 maximum, side mounted)..... Spring Forward Idle and 8 Steps For Throttle, etc.

Lever Styles (side mounted) ..... Large Flag Type, Special Shapes Optional

Push To Operate Safety Bar ..... Standard

Lever Guards ..... Optional

Labeling..... Custom, Reverse Engraved Polycarbonate and Multi-layered Mylar

Diagnostic Port to IBM® PC..... Standard

Keylock Switch ..... Standard (Power On/Off)

Security..... An optional ‘keyless entry code" is available.

Antenna..... Internal (External Optional)

Low Battery Indicator ..... 2 Color LED: Green - Battery Normal; Red - Battery Low

Micro-Controller ..... 80C51 Family

Short Circuit Protection..... Automatically Resetable Pollyswitch™ (No Fuses)

Conformal Coating..... Standard on PC Board

Transmitter Frequency ..... Synthesized 425-447 MHz or 447-471 MHz

Power Output..... 447-473 MHz: 450 mW Maximum

425-447 MHz: 450 mW Maximum

Emission/Modulation..... 14KOF1 D ± 2.5 KHz for 100%

Synthesized Channels..... 16 Maximum (Factory Programmed)

FEATURES SUMMARY

- ***Material***
  Extruded aluminum body with fiberglass sides covered with molded rubber. These sides are designed as a switch guard. They are held in place with stainless steel screws.

- ***Battery Compartment and Door***
  A large, hinged door with gaskets covers the battery tray, which is separated from the electronics by the main body. A metal latch holds the door in place.

- ***Battery Connection and Electrical Protection***
  Electrical connections are by stainless steel springs with a wiping action that makes contact when the battery is placed into the tray. Electrical short-circuit protection is built into the battery tray via a Pollyswitch' device. This device resets once the short is cleared and there are no fuses to replace.

- ***Weight and Dimensions***
  The standard 12 toggle unit weighs approximately 3 pounds and is 9.75 inches high x 3.75 inches wide x 4 inches deep. (A chest pack unit with one or two side-mounted lever switches is the same height, 2 inches wider per switch added, and has little noticeable weight change.)

- ***Battery Management***
  There is a two stage battery condition indicator light, which FLASHES GREEN when the unit is ON and the battery is OK. It FLASHES RED when the battery is low and sounds a beeper to alert the operator. The indicator is OFF when the battery is dead. A LOW BATTERY CUTOFF CIRCUIT stops the micro-processor when voltage goes below safe operating range. RF transmitters always operate at full power over the entire life of the battery.

- ***Labeling***
  A large easy-to-read reverse engraved custom faceplate is nearly indestructible. It has large letters that won't wear off or fill with dirt.

- ***Waterproofing/Dustproofing***
  There is extensive gasketing throughout construction. Each switch is totally sealed as are the battery door and end plates. The circuit board is conformal coated.

- ***Switch Protection From Accidental Operation***
  Rubber sides guard the toggle switches from most accidental bumps. A convenient palm-operated bar must be pressed to allow any motion switch electrical operation. Simply releasing the PTO bar stops all motion.

- ***Side-mounted Lever Styles***
  One or two side-mounted lever pods can be installed as an option. Standard units have a large easy-to-locate and comfortable 'FLAG' style paddle. Shaped knobs are available as an option.

- ***Self Diagnostics Capabilities***
  There is extensive power ON self-testing with two beeps from the beeper. A standard tilt switch and beeper are used to check all switches (ACTIVATED BY HAVING THE UNIT TILTED WHEN POWER IS TURNED ON). A diagnostic port is standard to allow connection to an IBMO PC for in-depth analysis by technicians.

- ***Interconnection Circuitry and Connectors***
  Flex circuits are used intensively to reduce wiring and improve reliability. Connectors are goldplated throughout.

- ***Synthesized RF Transmitters***
  Used in 450 MHz operations, it reduces the spare controller requirements. Models with up to 16 RF channels are available.

MODEL SUMMARY CHART FOR CATTRON SERIES TOGGLE CONTROLLERS

	ITEM	PART NUMBER	DESCRIPTION
*	1	01C-0177	Upper Main Body Assembly
+	1	01C-0177EA	Upper Main Body Assembly with Hardware – Connecting Kit For External Antenna
*	2	01C-0176	Lower Main Body Assembly with Hardware
*	3	01C-0172L	Assembly, Left End Cap Standard, With Sonalert, Internal Antenna With Hardware
+	3	01C-0172L-V	Assembly, Left Endcap Optional, With Voice, Internal Antenna, With Hardware
*	4	01C-0172R	Assembly, Right Endcap Standard, With Keyswitch, With Hardware
+	4	01C-0172R-BC	Assembly, Right Endcap Optional, With Keyswitch, With Hardware
*	5	01C-0178	Push To Operate (PTO) Bar Assembly
*	6	01C-0278T	Door Assembly (Battery Cover) With Hardware
*	7	01C-0282T	Battery Assembly Tray
+	8	See next page	Left Hand Lever Switch Assembly
+	9	See next page	Right Hand Lever Switch Assembly
+	10	M840T	M840T For Toggle Controller (Plain No RF Section)
*	12	01C-0183	840 Switch Board Assembly with 12 Predrilled Switch Holes
+	12	01C-0183B	840 Switch Board Assembly-No Switch Holes Drilled
*	13	Does not apply	Custom Reverse Engraved Face Plate
#	14	85C-0022	Antenna, External 450-470 MHz Flex Whip With BNC Connector
#	14	85C-0067	Antenna, External 450-470 MHz Stubby With BNC Connector
#	16	-	Antenna, External Connector Kit (BNC to Encoder Board Connector)
*	17	60C-0023	Battery, Alkaline Pack (White)
+	18	C-8096	Battery, NI-CAD Rechargeable Pack, Fast Charge (Yellow)
+	19	60C-0048	Battery, Mercury Pack (White)
+	20	60C-0006	Battery, Individual Alkaline, 1.5V “AA” (10 Required)
+	21	NLN-8106	Battery Holder For “AA” Alkaline Cells
+	22	01C-0185	Battery Charger (Wall Transformer For Fast Charge) NOTE: Controller must have internal charge option.
+	23	NLN-8005	Battery Charger (Desk Top) For 10 Hour Charge
+	24	CPA-34G200C	Battery Manager (Battery Removed From Controller)
+	25	CPA-0281	Serial Cable For Diagnostics – PC to Controller
+	26	CPA-0304	Diagnostic Monitor Software For PC (PC & Cable Required) (3-1/2 and 5-1/4 Inch Floppy Disks)
*	27	42-82608H03	Carry Strap – Shoulder Sling With Snap Hooks
*	28	42C-0056	Carry Strap – Chest Pack With Snap Hooks

LEGEND

- \- = NOT AVAILABLE
- * = ONE ITEM SUPPLIED
- \+ = ACCESSORY/OPITION
- \# = ACCORDING TO FREQUENCY BAND (Specify Freq. Band and RF Deck Used)

CATTRON SERIES TOGGLE CONTROLLER ACCESSORIES

	ITEM	PART NUMBER	DESCRIPTION
+	8	CPA-0275T	Left Hand Lever Switch Assembly (Stepped) 11 Pos. Return to Center
+	8	CPA-0275TSF	Left Hand Lever Switch Assembly (Stepped) 11 Pos. Return to Forward
+	8	CPA-0275TSR	Left Hand Lever Switch Assembly (Stepped) 11 Pos. Return to Reverse
+	8	CPA-0275TNS	Left Hand Lever Switch Assembly (Stepped) 11 Pos. No Spring
+	8	CPA-0275TSS	Left Hand Lever Switch Assembly (Stepless) Return to Center
+	8	CPA-0275TSSF	Left Hand Lever Switch Assembly (Stepless) Return to Forward
+	8	CPA-0275TSSR	Left Hand Lever Switch Assembly (Stepless) Return to Reverse
+	8	CPA-0275TSSNS	Left Hand Lever Switch Assembly (Stepless) No Spring
+	9	CPA-0274T	Right Hand Lever Switch Assembly (Stepped) 11 Pos. Return to Center
+	9	CPA-0274TSF	Right Hand Lever Switch Assembly (Stepped) 11 Pos. Return to Forward
+	9	CPA-0274TSR	Right Hand Lever Switch Assembly (Stepped) 11 Pos. Return to Reverse
+	9	CPA-0274TNS	Right Hand Lever Switch Assembly (Stepped) 11 Pos. No Spring
+	9	CPA-0274TSS	Right Hand Lever Switch Assembly (Stepless) Return to Center
+	9	CPA-0274TSSF	Right Hand Lever Switch Assembly (Stepless) Return to Forward
+	9	CPA-0274TSSR	Right Hand Lever Switch Assembly (Stepless) Return to Reverse
+	9	CPA-0274TSSNS	Right Hand Lever Switch Assembly (Stepless) Return to Reverse

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CUSTOM CONTROLLER EXAMPLE PHOTOGRAPHS

T01 THREE MOTOR, THREE SPEED CRANE CONTROL
INCLUDES MAGNETS AND OTHER AUXILIARY FUNCTIONS

T01 “CHESTPACK” STYLE LOCOMOTIVE CONTROLLER
WITH TWO SINGLE AXIS LEVER CONTROLS