Installation and Operating instructions for

Control Panel CP77xx

Version: 1.6
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BECKHOFF

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General Notes

Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards. It is essential that the following notes and explanations are followed when installing and commissioning these components.

Liability conditions

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

The documentation has been prepared with care. The products described are, however, constantly under development. For this reason, the documentation may not always be have been fully checked for consistency with the performance data, standards or other characteristics described. None of the statements in this manual represent a guarantee for as set out in § 443 of the German Civil Code or a statement about the assumed use according to the contract as set out in § 434 para. 1 clause 1 no. 1 of the German Civil Code. In the event that it contains technical or editorial errors, we retain the right to make alterations at any time and without warning. No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

Description of safety symbols

The following safety symbols are used in this operating manual. They are intended to alert the reader to the associated safety instructions.

Danger

This symbol is intended to highlight risks for the life or health of personnel.

Warning

This symbol is intended to highlight risks for equipment, materials or the environment.

Note

This symbol indicates information that contributes to better understanding.

Basic safety measures

Warning

Before opening the control panel housing, and whenever the control panel is not being used for control purposes (such as during functional checks after a repair), all parts of the equipment must first be switched off, after which the control panel is to be disconnected from the equipment.

Disconnect the device by unplugging the connectors on the Control Panel side.

Items of equipment that have been switched off must be secured against being switched on again.

Danger

Displays used for the control panel's LC-display are operated with a voltage of up to 1000 V, depending on type. For that reason:

The supply voltage must be disconnected before the housing of the Control Panel is opened.

Note

Assembly work on the Control Panel during operation may damage the panel:

- if metal objects such as screws or tools fall onto operating circuit boards.
- if connecting cables internal to the control panel are removed or inserted during operation

Operator's obligation to exercise diligence

The operator must ensure that

- the Control Panel is only used for its intended purpose (see *Product Description* section);
- the Control Panel is only operated in a sound condition and in working order;
- the instruction manual is in good condition and complete, and always available for reference at the place of installation of the Control Panel;
- the Control Panel is operated, maintained and repaired only by suitably qualified and authorized personnel.
- the personnel is instructed regularly about relevant occupational safety and environmental protection aspects, and is familiar with the operating manual and in particular the safety notes contained herein.
- none of the safety and warning notes attached to the Control Panel are removed, and all notes remain legible.

National regulations depending on the machine type

Depending on the type of machine and plant in which the Control Panel is used, national regulations governing the controllers of such machines will apply, and must be observed by the operator. These regulations cover, amongst other things, the intervals between inspections of the controller.

The operator must initiate such inspections in good time.

Procedure in the event of a fault

In the event of faults at the Control Panel, the list in the section *Troubleshooting* can be used to determine the measures to be taken.

Operator requirements

Read the operating instructions

Anyone who uses the Control Panel must have read these operating instructions.

Software knowledge

Every user must be familiar with all the functions of the software installed on the Control Panel to which he has access.

UL-Certificate of Compilance

We herewith confirm that the Control Panel CP77xx of Beckhoff Automation GmbH meets the requirements of the Underwriters Laboratories Inc.® (UL)-standard:

Certificate Number:	*280607 – E220403*
Report Reference:	*E220403, April 16th, 2007*
Issue Date:	*2007 June 28*

Standards for Safety

The correspondance of the mentioned product with these requirements is proved by the fact that this product meets with the following single standards:

- UL 60950-1, 1st Edition, 2006-07-07 (Information Technology Equipment – Safety - Part 1: General Requirements)
- CSA C22.2 No. 60950-1-03, 1st Edition, 2006-07 (Information Technology Equipment - Safety - Part 1: General Requirements)

Product Description

Appropriate Use

The CP77xx Control Panel is designed for industrial application in machine and plant engineering. In addition to the integrated PC, a TFT display, touch screen/pad (optional) and a PC keyboard (optional) are accommodated in an aluminium housing. The Control Panel is installed via the 4 mounting holes in the backplane or the pivot arm adapter (optional).

Do not use the Control Panel in areas of explosive hazard

The Control Panel must not be used where there is a risk of explosion.

Connections

Control Panel CP77XX connections

Pin assignment

X 100
Serial interface

SG 12POL M16-built-in-PCB-sold. IP67 BINDER (BINDER 09-0463-90-19 prod. 723 M16X0,75)

For connecting use the provided *RS 232-adapter cable*.

X 101
Power supply

SG 4POL M12-built-in-PCB-sold. IP67 BINDER (BINDER 09-3431-90-04 prod. 763 M12X1)

Pin	Signal	Pin	Signal
1	+ 24V	3	GND
2	NC	4	NC

X 102, X 103
Network

RJ-45 connector (Ethernet 10/ 100 Mbit)

Pin	Signal	Pin	Signal
housing	screen	5	n.c.
1	TD +	6	RD -
2	TD -	7	n.c.
3	RD +	8	n.c.
4	n.c.		

Connector description

Serial interface

Serial interface COM1

The Control Panel is equipped with a COM1 (**X 100**) serial interface (Type RS232) for the connection of serial peripheral devices.
The protection class of the circular plug-in connector accords to the IP67-standard.

Power supply

Power supply

The power supply for the Control Panel is established via the Cage clamp socket **(X 101).**
The protection class of the circular plug-in connector accords to the IP67-standard.

Network interfaces

Network

The RJ-45 sockets (**X 102, X 103**) enable connection of the Control Panel to an Ethernet network.
While using the FBS-RJ45-8-GS-connector (534494, Fa. Festo AG & Co.KG) the protection class accords to the IP67-standard.

Protective Earthing

Protective Earthing

The low resistance protective earthing connection is established via the ground bolt, which is located at the rear of the housing.

Ethernet cable sets

Patch-Cable	
C9900-K411	Patchcable-Set CAT 7, length 5 m
C9900-K412	Patchcable-Set CAT 7, length 10 m
C9900-K413	Patchcable-Set CAT 7, length 15 m
C9900-K414	Patchcable-Set CAT 7, length 20 m
C9900-K415	Patchcable-Set CAT 7, length 25 m

RS 232-adapter cable

RS 232-adapter cable

The provided RS 232-adapter cable with the marking C9900-K234 allows connecting serial peripheral devices with SUB-D-connector to the Control Panel.

Pin assignment:

12-pol. Cable connector	*9-pol. Sub-D-connector*	*Signal*
A	**1**	DCD
B	**6**	DSR
C	**2**	RxD
D	**7**	RTS
E	**3**	TxD
F	**8**	CTS
G	**4**	DTR
H	**9**	RI
J	**5**	GND
K	**-**	n.c.
L	**-**	n.c.
M	**-**	n.c.
screen	**screen**	screen

Installation Instructions

Please also refer to chapter *General Notes*.

Transport and Unpacking

The specified storage conditions must be observed (see chapter *Technical data*).

Transport

Despite the robust design of the unit, the components are sensitive to strong vibrations and impacts. During transport, your Control Panel should therefore be protected from excessive mechanical stress. Therefore, please use the original packaging.

Warning

Danger of damage to the unit!
If the device is transported in cold weather or is exposed to extreme variations in temperature, make sure that moisture (condensation) does not form on or inside the device.

Prior to operation, the unit must be allowed to slowly adjust to room temperature. Should condensation occur, a delay time of approximately 12 hours must be allowed before the unit is switched on.

Unpacking

Proceed as follows to unpack the unit:

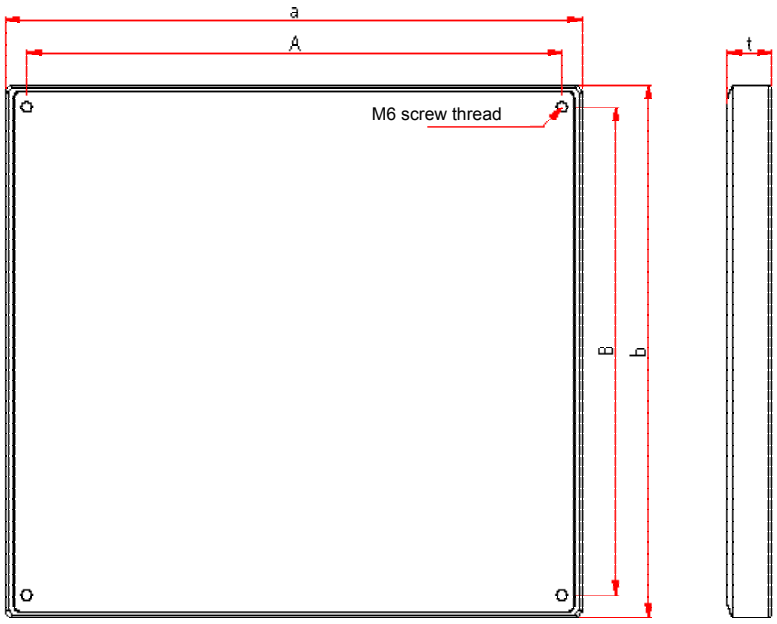
1. Remove packaging.
2. Do not discard the original packaging. Keep it for future relocation.
3. Check the delivery for completeness by comparing it with your order.
4. Please keep the associated paperwork. It contains important information for handling the unit.
5. Check the contents for visible shipping damage.
6. If you notice any shipping damage or inconsistencies between the contents and your order, you should notify Beckhoff Service.

Assembly

Assembly dimensions

All dimensions are in mm.

Control Panel CP77xx



Dimensions		a	b	t	A	B
CP7709	6,5“ Display	267,9	173	38	241,9	149
CP7700	10“ Display	353,8	308,3	27,5	327,6	280,7
CP7701	12“ Display	353,8	326,3	27,5	327,6	303,7
CP7702	15“ Display	426	395	28,5	399,8	367,4

Control Panel CP771x

Dimensions		a	b	t	A	B
CP7719	6,5“ Display	267,9	213	38	241,9	189
CP7710	10“ Display	353,8	308,3	27,5	327,6	280.7
CP7711	12“ Display	353,8	326,3	27,5	327,6	303,7
CP7712	15“ Display	426	395	28,5	399,8	367,4

Control Panel CP772x

Dimensions		a	b	t	A	B
CP7729	6,5“ Display	336	213	38	310	189
CP7720	10“ Display	406	308,3	27,5	374,8	280,7
CP7721-0000/1	12“ Display	406	308,3	27,5	374,8	280,7
CP7721-0002	12“ Display	439,8	308,3	27,5	408,6	280,7
CP7722	15“ Display	515	370,2	28,5	483,8	342,6

Control Panel CP773x

Dimensions		a	b	t	A	B
CP7730	10“ Display	403,2	368,2	27,5	372,15	340,6
CP7731-0000/1	12“ Display	406	370,2	27,5	379,8	342,6
CP7731-0002	12“ Display	426	370,2	27,5	399,8	342,6
CP7737	12” Display	426	370,2	27,5	399,8	342,6
CP7732	15“ Display	483	410,2	28,5	458,8	387,6

Connecting the Control Panel


Danger


Warning

The Control Panel must never be connected or disconnected in an area that is subject to explosion hazard! Risk of explosion!

The mains plug of the Control Panel must be disconnected!

Please read the documentation for the external devices prior to connecting them.

During thunderstorms, plug connector must neither be inserted nor removed.

When disconnecting a plug connector, always handle it at the plug. Do not pull the cable!

Connecting cables

The connections are located at the rear of the Control Panel and are documented in the *Product Description* section.

When connecting cables to the Control Panel, please adhere to the following order:

- Disconnect the Control Panel from the power supply
- Connect all cables at the Control Panel and at the devices to be connected
- Ensure that all screw connections between connectors and sockets are tight!
- Reconnect all devices to the power supply.

Protective Earthing

Protective Earthing

The low resistance protective earthing connection is established via the ground bolt, which is located at the rear of the housing.

Operating Instructions

Please also refer to chapter *General Notes*.

Functional description

Switch on

The Control Panel does not have its own mains power switch. As soon as the power supply is switched on the control panel is activated.

Switching off

Control software, as typically applied in Control Panels, enables the assignment of different rights to all users. A user who is not entitled to shut down the software may not switch off the Control Panel as an attempt to shut it down when the software is running could result in the loss of software data on the Compact Flash memory card.

If the control panel is shut down while the software is writing a file onto the Compact Flash memory card, the file will be destroyed. Control software typically writes something to the CF memory card every few seconds, so that the probability of causing damage by switching off while the software is running is very high.

Operation

The Control Panel's membrane keypad may only be actuated by fingertips.

Note

Attempts to actuate it with other objects can easily result in the destruction of the device. Neither may the membrane keypad be operated with a touch screen pen.

The touch screen may only be actuated by finger tips or with the touch screen pen. The operator may wear gloves but there must be no hard particles such as metal shavings, glass splinters embedded in the glove.

Keyboard codes

Type-dependent number of keys

Depending on the precise type, the Control Panel can have fewer keys than those described here.

Operation

The cursor is the blinking character that marks the point at which the next character entered will be displayed. The cursor is also known as the insertion point. The cursor keys each move the cursor one place in the associated direction.

The Home key moves the cursor to the beginning of the line, while the End key moves it to the end of the line.

The *Pg Up* key scrolls one page back, the *Pg Dn* key scrolls one page forward.

The Tab key takes the cursor to the next input field, while Shift and Tab moves to the previous input field.

The mouse cursor can be moved over the screen with the aid of the touch screen or of the touch pad (optional). The keys correspond to the left and right hand keys of a Microsoft mouse.

The *Del* key deletes the character to the right of the cursor.

The *Ins* key causes characters to the right of the cursor to be overwritten. The overwrite mode is cancelled by pressing the key again.

Print-Screen prints a hard copy of a text screen on the printer.

The Pause key stops the computer until another key is pressed (only under MS-DOS).

Your input is confirmed with the Enter key.

Backspace deletes the character to the left of the cursor.

If the Shift key is pressed at the same time as another key, then instead of the numbers you obtain the character printed above the number, and you obtain upper case letters instead of lower case letters.

Pressing the *Caps Lock* key once activates and locks the *Shift* key. Pressing the *Shift* key cancels this function.

Rather like the effect of the *Shift* key, *Ctrl* and *Alt* also change the meaning of another key that is pressed at the same time.

This key brings up the Start menu of the operating system in use (Windows 95, 98, ME, NT, 2000, XP).

Pressing this key opens the property sheet of the active (or marked) object.

The *Esc* key has the effect of closing dialog windows and of interrupting some of the computer's working operations.

All other keys bring the character printed on them onto the display at the position of the cursor.

The meaning of the function keys, *F1* to *F10*, is determined by the software and is displayed at the bottom edge of the display.

The function of the special keys above the display is also determined by the software. The function is displayed at the top edge of the display. The special keys each have an orange LED controlled by the software.

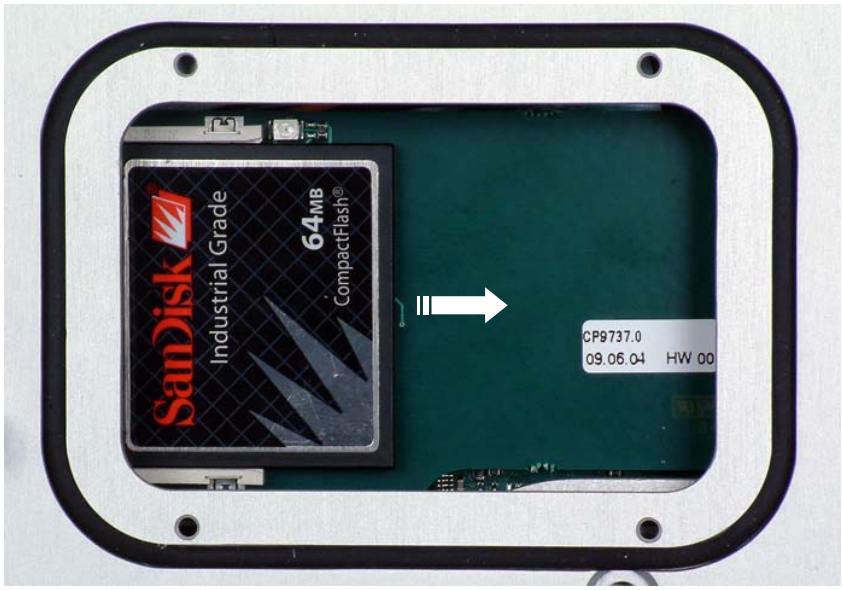
Compact Flash memory card

Compact Flash card

A Compact Flash memory card (CF card) is located behind a cover at the rear of the Control Panel. It is provided to save the operating system. Only use memory cards with extended temperature ranges according to industrial standards!

Removing the cover

To change the CF card, first of all unscrew the four screws (see above photo) with a crosstip screwdriver. The aluminium cover can be removed and enables access to the memory card (see below photo).



Removing the CF card

The CF card can be removed with due care along the guides.

Warning

Avoid any use of force! Otherwise the contact pins may be damaged!

Insertion of CF card

Installation is in reverse of the above order. Make sure that the circumferential rubber seal fits correct while mounting the cover.

Servicing and maintenance

Please also refer to chapter *General Notes*.

Cleaning the Control Panel

First switch off the Control Panel

Switch off the Control Panel and all devices connected to it, so that keys cannot be unintentionally actuated.

The front of the Control Panel can be cleaned with a soft, damp cleaning cloth. Do not use any aggressive cleaning materials, thinners, scouring material or hard objects that could cause scratches.

Servicing

The Control Panel is maintenance-free.
A battery is installed on the motherboard to buffer data. This battery is maintenance-free and may only be replaced by **Beckhoff Service**!

Replacing the fluorescent lamps in the display

Since fluorescent lamps represent a consumable item in a display, they must be replaced after a few years, depending on the number of operating hours.

The fluorescent lamps of the 6.5 inch, 12 inch and 15 inch displays can be replaced by a **technically competent person**.

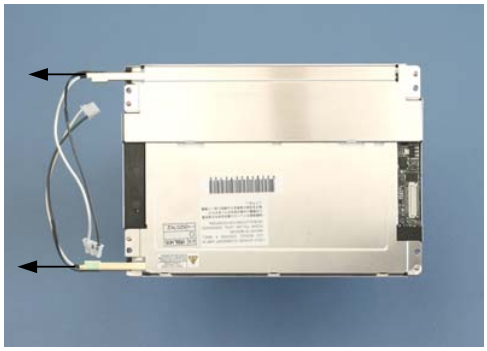
Note

Replacement of the fluorescent lamps may require partial disassembly of the display!

Replacement for the 6.5 inch display

Press down the plastic clips below the supply cable of the lamps while you carefully pull out the fluorescent lamps in direction of the arrows.

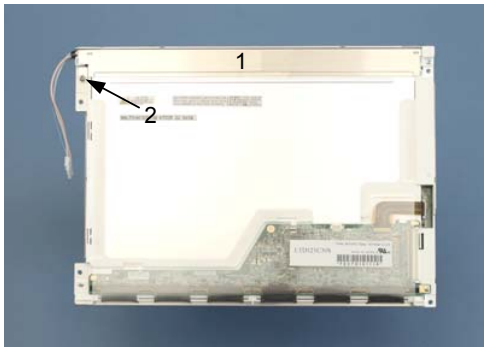
After the exchange of the fluorescent lamps the installation takes place in reverse order.



Replacement for the 12 inch display

First release the screw (**2**) with a small Philips screwdriver, then tilt the fluorescent tubes with their brackets (**1**) carefully outwards.

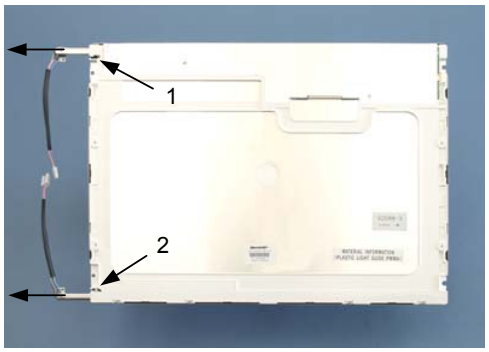
After the exchange of the fluorescent lamps the installation takes place in reverse order.



Replacement for the 15 inch display

First release the two screws (**1**) and (**2**) with a small Philips screwdriver, then carefully pull out the fluorescent lamps in direction of the arrows.

After the exchange of the fluorescent lamps the installation takes place in reverse order.



Lamp sets

Order number	Background illumination unit for
C9900 - L360	6.5 inch TFT display NL6448BC20-08
C9900 - L364	12 inch TFT display LTD121C30S
C9900 - L366	15 inch TFT display LQ150X1LW71N

Emergency procedures

In case of fire, the control panel should be extinguished with powder or nitrogen.

Shutting down

Disposal

Dismantle the Control Panel

The device must be fully dismantled in order to dispose of it. The housing can be sent for metal recycling.

Observe national electronics scrap regulations

Electronic parts such as lamps and circuit boards must be disposed of in accordance with national electronics scrap regulations.

Troubleshooting

Please also refer to chapter *General Notes*.

Note

Pixel errors in the TFT display are production-caused and represent no complaint-reason!

Fault correction

Fault	Cause	Measures
No Control Panel function	No power supply to Control Panel Cable not connected	Check power supply cable 1. Correctly connect cable 2. Call Beckhoff Service
Control Panel boots, software starts, but control does not operate correctly	The cause of the error is in the software or in parts of the equipment outside the control panel	Call the manufacturer of the machine or the software
The Control Panel has only partial function, or only functions some of the time, for instance the picture is dark or absent	Faulty fluorescent bulb in the display Defective components in control panel	Replace fluorescent tube in the display in accordance with description Call Beckhoff Service

Service and Support

Beckhoff and their partners around the world offer comprehensive service and support, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on her internet pages:
http://www.beckhoff.com

You will also find further documentation for Beckhoff components there.

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- spare parts service
- hotline service

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e-mail:	service@beckhoff.com

Quote the project number

If servicing is required, please quote the **project number** of your Industrial PC.

Appendix

Technical data

Dimensions	**Dimensions (W x H x D):**	see section *Assembly dimensions*
Operation in areas that are subject to explosion hazard	**The Control Panel must not be used where there is a risk of explosion.**	
	The following conditions must be observed during operation:	
Environmental conditions	**Ambient temperature:**	0 to 55°C
	Atmospheric humidity:	Maximum 95%, non-condensing
Shock resistance	**Sinusoidal vibration:**	
	(EN 60068-2-6)	10 to 58 Hz: 0.035 mm 58 to 500 Hz: 0.5 G (~ 5 m/ s^2)
	Impact:	
	(EN 60068-2-27/ 29)	5 G (~ 50 m/ s²), duration: 30 ms
Protection class	**Control Panel:**	IP65
	Ethernet Connector:	IP65
Power supply	**Supply voltage:**	24 V_{DC} (20.4 – 28.8 V_{DC})
	Power consumption:	approx. 15 W with 6.5“ display approx. 17 W with 10“ display approx. 19 W with 12“ display approx. 30 W with 15“ display
EMC compatibility	**Resistance to interference:**	conforms to EN 61000-6-2
	Emission of interference:	conforms to EN 61000-6-4
Transport and storage	The same values for atmospheric humidity and shock resistance are to be observed during transport and storage as in operation. Suitable packaging of the Control Panel can improve the resistance to impact during transport. The ambient temperature during storage and transport must be between -20°C and +65°C.	

Note

Pixel errors in the TFT display are production-caused and represent no complaint-reason!

Approvals

FCC: Federal Communications Commission Radio Frequency Interference Statement

FCC Approval for USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC: Canadian Notice

FCC Approval for Canada

This equipment does not exceed the Class A limits for radiated emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.