

# The Philips AutoDome G3

In this issue of CCTV focus we test-drive the new Philips' AutoDome G3 colour PTZ dome camera that will please installers and architects equally

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**P**an, tilt and zoom cameras have really gone through a little revolution in the last couple of years. Instead of the earlier bulky pan/tilt heads, with additional housing and separate camera, zoom lens and let's not forget the essential site driver, these days we have small and elegant PTZ domes.

The main advantage of PTZ domes over the modular PTZ cameras is that all the components, including the P/T mechanism, the camera, the zoom lens, the site driver and the dome housing come as one complete unit.

No more wasting time with back-focusing. I believe that future CCTV generations of installers will not even know what back-focus is.

Furthermore, the PTZ domes are getting smaller, simpler to install and service, faster and more intelligent in their operation.

Almost all major CCTV manufacturers have a PTZ dome camera.

More so, they are all almost the same size and look alike (how different can a dome look?). It is getting harder to know which one is better or which one offers special

Pendant (wall)



Photo courtesy of Philips



features that might be very important for your particular installation.

It is also true to say that it is getting harder to make a mistake as they all seem to come very close in quality and performance. Well, almost all...

For this issue's Test-Drive, I have decided to play around with the new Philips G3 AutoDome, model number LTC 0825.

Thanks to David Tullipan from Philips Australia, I had the latest model flown from Singapore to our office in Sydney.

This is a 6.3" dome (160 mm) equipped with some very special features.

Inside the dome is a 1/3" colour CCD camera (a monochrome dome is also available, model number LTC 0725), equipped with 100x zoom, 16x optical (4.5 ~72mm) plus 6.3x digital.

The model I was given was a wall-mount, and needless to say, ceiling mount pendant and suspended models are also available. For the picky architects, they come in two different colours white and charcoal.

The camera came in three well packed boxes, and as always with any installation, I was expecting that I would spend at least half a day running cables and terminating, familiarising myself with the

concept, programming and so on. Well, I was wrong.

The first, and good, thing that is part of the concept is the ease of installation and putting things together. I literally spent only half an hour, and this was mostly when mounting the back-plate of the bracket. Everything else is basically clip-on. A truly "Plug-and-Play" concept.

Some dome manufacturers do not have stand alone keyboards ready to control the domes, but rather they count on the matrix manufacturers' keyboards, where such domes would usually be installed. The Philips G3 dome can be controlled without the need for a large matrix switcher, directly from the Philips keyboard. This makes installation of small to medium size CCTV systems (up to half a dozen cameras) a breeze. One keyboard can control up to 16 G3 domes in a "daisy-chain" configuration. In such cases, the dip switch IDs on each dome have to be set to a different number.

The dome I got for testing was a clear plastic, but tinted are available as well.

Once everything got connected, I was curious to see the quality of the image and the control func-

Pendant (pipe)



Photo courtesy of Philips

tionalty.

The first impression: G3 is very quiet and fast. The image quality is what you would expect from somebody like Philips, clean and sharp image with extremely high quality colour reproduction. I had a rose in a vase in the same room where the monitor was and zoomed on it. The colour quality that came up on the monitor was 100% identical to what I saw with my own eyes. The G3's camera is equipped with automatic sensing and TTL white balance capable of coping with colour temperatures between 2700°K and 9000°K. This practically means that the G3 can match the spectrum of almost any light source and produce a natural look on your monitors (providing the monitors are OK, that is). For our testing we used an NEC calibrated monitor.

The G3 moves smoothly and fast, with a manual control of up to 120°/s. The control is proportional to the zooming factor, i.e., when you zoom in the movements are slower, and they get down to 0.5° when fully zoomed in.

This is more or less the case with most PTZ domes, but what I liked with this keyboard was the zooming thumb-wheel on the joystick. This is a very natural and intuitive operation for zooming. The G3 has an automatic focus as well, so you can imagine how simple and fast the response of an operator can be. Following a person with a typical keyboard and joystick could be at least three times slower than when compared to a thumb-wheel joystick and auto-focus camera. Of course a manual override focus can be done using the buttons on the keyboard.

The fastest movement speed is achieved when preset position is

recalled. The panning speed then is 360°/s. This equates to a maximum response time when a preset is recalled (usually by an alarm) of 0.5 seconds. This applies only if the camera happens to look in the completely opposite direction of the preset. So a typical preset response time would be only a fraction of a second.

Such a speed was unimaginable just a couple of years ago. Today, using these facts, a CCTV system can be designed so that a single PTZ dome camera, when designed and located correctly, may effectively replace a number of fixed or slow speed PTZ cameras covering the same area.

The camera includes an on-screen display during programming to ensure correct first time setup. It comes standard with 16 character sector titling (16 sectors) and pre-position titling (99 pre-positions) so that viewing angles and locations are always known. This could be a very useful function for control rooms with many operators and cameras, covering a lot of areas which could be individually named.

A more inter-

esting feature is the "voice recording" device for 180 seconds. Only in this case instead of a voice it records the keyboard activity. This includes all movements of the joystick, zoom, focus, pauses, presets, AGC and even camera set-up. After the recording is finished this becomes a "Guard Tour" which can easily be recalled at a touch of a button. A very simple and useful control function. For large systems, where guard tours are performed regularly, this feature is a life saver.

The G3 dome moves continually 360°, as is the case with most other domes. Unlike most other domes, the G3 does CCD chip flipping automatically when a person is followed passing exactly below the camera. Philips calls this feature AutoPivot.

Philips claims that they have designed the G3 with rugged new motors and fewer moving parts to ensure reliability, making the G3 ideal in high-usage situations like hotels and casinos. Some PTZ dome manufacturers use belts for fast and accurate movement of the camera/lens assembly, but Philips have decided to use direct drive motors and a few plastic gears. Plastic gears were not very popular earlier with the bulky PTZ cameras, but



since the G3's total weight is less than 3 kg, this should not represent a wearing problem and it minimises on moving parts. Philips people are so confident in the quality of the dome that they offer a three year warranty for the indoor models and two years for outdoor.

The manufacturer states better accuracy than ±0.5°. This is obviously derived from the backlash error in the motors and their gear-



*These are all the components required to set-up the G3 PTZ dome*

ing, and it equates to an error of less than 90 cm when zooming to an object at a distance of 100m.

I did test this accuracy with multiple repetitive recall of a pre-set position, and I was surprised that even with 100x magnification the camera was always pointing at the same object, not missing more than 10mm. At a distance of approximately 5m between the camera and the object (pliers shown on the photos) this is equivalent to an error of less than 0.1°. This is a pretty good number for any dome.

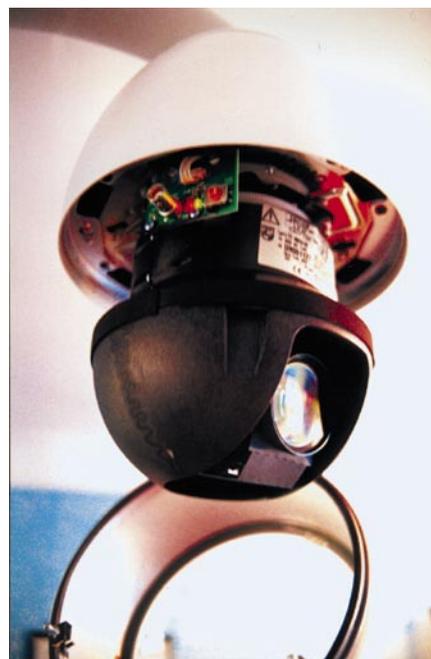
The camera electronics is

equipped with the back light compensation circuitry allowing for a range of difficult lighting conditions to be handled. The camera resolution is over 400 TV lines which is quite standard for most PTZ domes. The important thing is that the clear dome does not show any optical distortions even with the highest optical zoom. This is a very trivial, but critical part of any PTZ dome. Since domes have a spherical surface, if they are not made with two optically perfect surfaces it can easily affect the optical quality. The Philips people have produced a rather high quality

optical dome as I could not detect any distortions in our testing.

It should be pointed out that fingerprints and dirt may have similar effect to a dome imperfection, and for our testing we have used photographic quality lens cleaning liquid before the camera was powered up.

The powering of our G3 camera was via 240 Volts, which was transformed into 24 VAC inside the camera dome. The camera can be switched between the Internal synchronisation and line-lock. The vertical phase (V-phase) adjust-



*The dome can be removed quite easily without the fear of dropping it on the ground because of the safety chain*

ment can be performed from the keyboard itself, which makes synchronising multiple cameras in a large installation much easier.

The G3 camera produces a video signal at some pretty low light levels down to 1 lux for useable video. But don't expect that you can go as low as some cameras with integration feature. This camera hasn't got the frame integration. In most situations where there are night street light levels above 5 lux the G3 will give you a full video signal. You may start



Diagram courtesy of Philips

## PHILIPS LTC 0825 AUTODOME G3 MANUFACTURER'S SPECIFICATION

### Camera Module

Colour CCD type:	1/3"
Horizontal resolution:	425 TV lines
Sensitivity (3200°K):	With clear dome, F/1.2 lens and 75% reflectance: 0.8 lx (usable video) 5 lx (full video)
Zoom range:	100× 16× Optical (4.5mm~72mm) F/1.2 6.3× Digital
S/N ratio (AGC off)	44dB minimum, 46dB typical (Unified weighting filter per CCIR Recommendation 567)
AGC:	30 dB maximum gain
Light range (AGC on):	50,000:1 minimum
White balance:	Automatic sensing TTL: 2700°K ~ 9000°K
Video output:	1.0 Vpp, 75 Ohm
Aperture correction:	Horizontal and vertical
Synchronisation:	Line-lock (synchronizes to power line zero crossing) Internal reference - crystal-lock
Power requirements:	24VAC/50/60Hz, 15W

### Pan/Tilt

Pan rage:	0° ~ 360° continuous
Tilt range:	0° ~ 90° from horizontal plane
Pan/Tilt speeds:	Manual mode: Proportional variable to 120°/s Ramp-up variable to 120°/s Preset positions: 360°/s (applies to pan only)
Preset positions:	99
Preset accuracy:	±0.5°

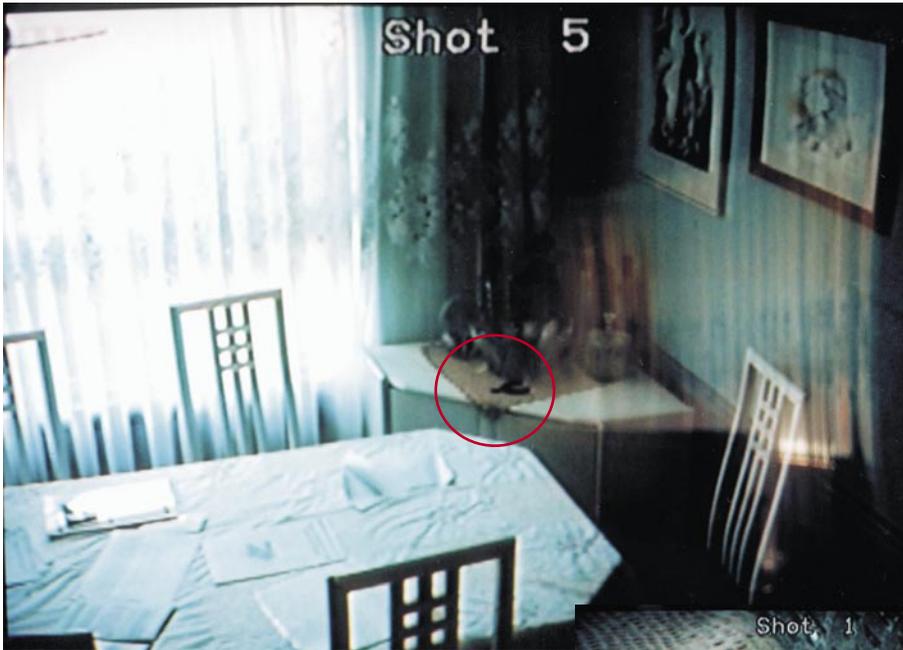
<b>Mechanical:</b>	Dome diameter 160mm (6.3") All other dimensions as per the enclosed drawings
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### Weight:

In-ceiling models:	2.7 kg
Pendant models:	3.6 kg

### Miscellaneous Features:

Camera setup/control:	Bi-phase or RS-232
Guard tour:	3 minute duration, all camera functions can be stored in Memory
Addressing:	3 digit "thumbwheel" type
Title:	16 characters
Sectors:	16 independent sectors



*A full, zoomed-out, view. This is a photograph of a monitor. The cutters in the centre of the screen are the zooming target*

having problems if the light is pretty low, like below 1 lux, although for such situations you should consider the monochrome version, which Philips claims goes down to 0.4 lux for a useable video.

The S/N we have tested on G3 is not as high as you would like to see with a camera like this. With our VM-700 we have measured around 45dB. I guess one can not "squeeze" any better signal from a 1/3" chip, which is not as good as with a 1/2" chip but is better than with a 1/4" chip as used by some other manufacturers. The size of the chip defines other important factors in designing a compact dome, and one of the most important is the lens' physical size and magnification ratio. With smaller size chips the lens' physical size goes down (preserving the same optical magnification) making the dome smaller and faster, but then the chip sensitivity and the S/N ratio go down compromising the video signal quality. So the PTZ domes are always a compromise between the size and the quality.

The picture quality in normal light conditions is very good, and the optical zooming quality is



*Maximum optical zoom (16X)*

impressive with 16x magnification. The thumb-wheel control intelligently stops when maximum optical zooming is achieved and when turned again, or held for a second, it goes into the digital zooming displaying at the same time the amount of zooming on the screen. Clearly, the digital zooming is not the same as optical, but it does prove to be a good assisting tool when trying to decipher something very far from the camera. A point of interest, the digital zooming can also be entered in the preset or guard tour sequence.



*The maximum 100X Zoom (16X optical + 6.3X Digital)*

The G3 is controlled by Philips'

proprietary "bi-phase" control (earlier Burle), but the specs say it also comes in RS-232 version.

Unfortunately in the CCTV industry there is no standard communication language or protocol and this locks the customers more or less with the one make of dome cameras and controllers (keyboards or matrix switchers).

I am not saying that Philips keyboards or matrix switchers are not good. Far from it. What I am saying is that the end users should know that if they have an existing matrix switcher other than Philips (Burle) with some old PTZ cameras, and if they decide to replace them with Philips G3 domes, they should not automatically assume they can control them. And to be more accurate, with some matrix switchers, or



*64X Zoom (4X Digital)*

code translators, this is possible even now, but wouldn't you like to see no limits and "no ifs and buts" when buying a PTZ dome camera?

This is an issue I have always raised with various manufacturers, and I can only hope that

one day, our CCTV industry would agree on one language, as is the case in the computer industry, so that equipment can be mixed and matched. This is not very difficult, all it needs is good will from the major manufacturers. The access control industry is already going through such an agreement at the

moment.

As a conclusion I would like to say that I enjoyed testing the Philips G3 AutoDome PTZ camera and I think it will be a very valuable camera in any larger system design. But I think with its small and intelligent control keyboard of the type LTC 5136, like the one I used, it will be even more attractive for small to medium size CCTV installations. Especially the ones that already have a old and outlived bulky PTZ camera assemblies on brackets or poles.

The G3 will be a complete refreshment, aesthetically and functionally. ☺

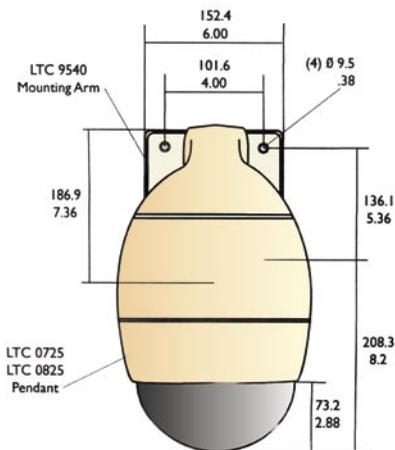
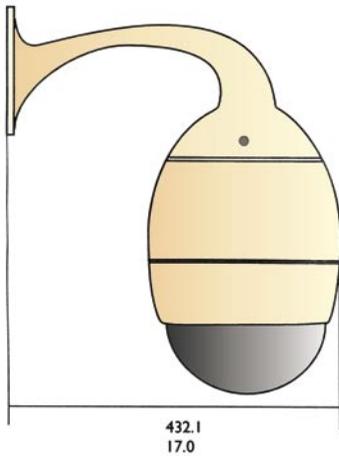


Figure 2: Pendant Arm Mounting

*Dear Readers,*

*CCTV focus is a bi-monthly magazine, published at the beginning of the month in January, March, May, July, September and November. The first issue was printed at the end of August with the intention of it to be launched at the ISC Expo in New York on the 31st August.*

*By mistake we have indicated on the cover that it is an August issue, but in fact it should have stated September 1999.*

*The next issue is due out in print by the middle of January 2000 due to the Christmas and New Year holidays .*

*Please send press releases, advertising artwork and articles so that they reach our office no later than the 15th of the month preceding the publishing.*

*Works for January issues are accepted until 22 December.*

*Thank you for your understanding and co-operation.*

**CCTVfocus**

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