

Technical Aspects

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Document Preface

This document briefly illustrates the technical aspects and possible configurations of the Micro-Cam Unit. It is both an intro-guide for more technical-minded readers as a footprint for a prospective customer. Subjects handled in this paper are illustrated by images, technical datasheets and additional product-information.

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1. Image Acquisition

Optical and Electronic Specifications



The Micro-Cam-Unit acquisition section consists of 5 AW-E860 2/3" 3-CCD 16:9/4:3 Convertible Camera's, each equipped with Fujinon Broadcast lenses of which 2 are wide-angle. By choosing this combination, the maximum signal quality on the acquisition side is guaranteed. On the side of the lens, one of the leading manufacturers in broadcast lenses has been chosen to rule out any possibility of spheric- and/or chromatic aberration. On the side of the pickup device, we have - for each color ofcourse - a full 2/3" CCD with a S/R-Ratio of 63dB, reducing the signal-noise, making the camera's as proven broadcast-compatible. They are fully native 16:9/4:3 switchable with a horizontal resolution of 850 effective lines (native widescreen).

Illumination Requirements

Due to their high SNR and their large sensors, the 860 can produce an acceptable image from 0.4 Lux on a lens-opening of F1.7 which makes them ideal for shooting at low-light conditions such as music events, night-shoots ,unlighted conferences and more. From this point, the dynamic range is expanded to 2000lux on a lens-opening of F11. With this range, they are capable of perfectly functioning amongst a larger broadcast studio-camera enviroment.



Camera Movement

As you might know, the uniqueness of the system is that these cameras are mounted on so-called "Pan-and Tilt heads". These servo-driven 'hot-heads' are remote controlled from within the Micro-Cam-Unit over the RS-422 data-protocol. The hot-head operator has the ability to move camera's on various panning-speeds directly 'on-air' as well as storing camera positions in the system's controller memory. This makes it easy to set-up all camera settings during a rehearsal and saving them for an easy recall during the actual show. Other data such as camera shading control, diafragm settings and much more can also be stored in the controller internal memory allowing the operator to slightly correct these settings during recording.

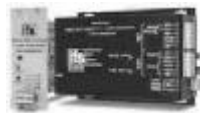
The hotheads are equipped with a standard camera mounting-plate so they can be installed on any tripod, bazooka, crane, dolly or even low-weight steady-cam use (camera without the hothead).

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Camera Video Signal

The camera body is equipped with a Serial Digital Interface as well as composite video at the same time. If required, it can also donate a Y/Pb/Pr signal. For the broadcasted signal, we use the SDI signal provided by the camera. This acquired video can be broadcasted to the unit by different ways: over fibre-optics and over classical copper lines, making it possible to choose the best solution, as well for the environment the camera's are placed in and of course to fit the technical production budget in the best possible way.

Fiber Optics



For optical signal transport we use multi-mode fibre optics. This signal-transport obtains signal quality over hundreds of meter instantly. Basically: what's sent out one way, comes out exactly the same on the other side. No signal compensation circuits required, no spikes, no latencies, no carrier differences, just a clean signal... Large distances can be crossed with a minimum of "cable". In the fibre-configuration, the camera signals (video, data, tally) are sent to a modulation-unit which basically converts the electrical signal into light. The modulated optical signal is then brought onto the actual fibre glass line which sends it to the unit. Various configurations are possible from 12 to 36 signals which can be sent and received at the same time.

Copper

In the case of small distances up to 80m (and smaller budgets), the signal can also be routed to the van electrically. For this, we use a multi-core cable sending the video, data, tally and power) directly to the unit. This provides a flexible, easy to set-up solution with the same quality as the optical way.

Signal Routing within Mobile Unit 1

Signal can be inserted into the system by ways of serial digital video (SDI) or component/composite analogue signals. The system also accepts CG-graphics by means of JPEG or GIF-file format for prompter/inserter. DVB-streams with mpeg/AC3-coding can also be converted in real time for insertion in the production mixer. Routing is obtained both by hard-patching at transmission-side or inbound at the back of the ob-van. Soft-patching for quick re-routing of signals can also be done within the production-mixer.

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3. Inside Mobile Unit 1



The Unit 1, which is the main production unit, is equipped with everything one needs for a multi camera production. It is operated by two persons, a camera-operator (called hothead-operator) and a production mixer which in most cases, is also the director of the program.

Switching

The mixing is obtained by a Panasonic MX-70 production switcher. This compact, comprehensive mixer is equipped with all technology for live production. It consists of a preview/mixing bus, audio-mixing, colour- and luminance keying, 2D & 3DfX and much more. All mixing functions are self-explained on a 7" TFT-display at the centre of the mixer where every setting can be changed with the push of a button or by turning a rotary encoder. All

signals are auto-synced within the mixer by a built-in and stable Digital Frame Synchroniser which excludes the need of an expensive SPG - and off course the need to tune the SPG before the show).

Monitoring

Video Signals are previewed by 7 Panasonic 9" LCD screens on which every signal can be fed. In most cases, these screens preview all the camera signals and any auxiliary signals that may be injected into the signal path. The mixing is previewed by a CRT-PVM and of

course, there's also a CRT-monitor for the actual program result. A calibrated Barco 12" Reference monitor can also preview any signal in the system. It is linked to a Tektronic Waveform Monitor and a Vectorscope for signal analysis. The input of these three devices is controlled by a Kramer SDI-switcher installed on the camera-operators side from which he/she can select the previewed signal. Of course there's also audio monitoring (and - metering if desired) by means of two Fostex active monitors.

Robotics Operation



The central control mechanism of the HotHeads and cameras in unit 1 is the Panasonic AW-RP605AN.

Shading of the cameras with this remote is always passing thru the head. This means that for manual use or use on a crane, we have to make use of tailor made cables between the head and the camera. All sorts of combinations are possible but the main idea is to have zoom and focus control by the camera operator and iris and shading



control in the car. The maximum distance at this time, is 50m to enable use on track / dolly systems.

Unit 2 has the new AW-RP400 controller in combination with the AW-CB400 shading box. This gives a choice to have 1 operator as in unit 1 or split up the job over 2 operators (hothead and shading). It also simplifies Manuel and crane set up, eliminating the need for tailor made cables.



The shading box is also the perfect combination with the new Twister Hotheads. The new controller can be combined with a horizontal roling unit.

In the hands of an experianced operator, all remotes can deliver smooth 'on air' moves.

All systems have memory features that create endless possibilities to deliver the right shots in time.

For shading at Micro Cam, the operators have grey charts and the BBC chart at their disposal.

Signal Recording & Transmission

Unit 1 can be equipped with one to three VTR's. These VTR's are built-in upon customer's request. We can record on the Digital Betacam, Betacam SX, DVCAM, DVCPRO25/50, DVCAM or even VDR-formats like Sony XDCAM / Panasonic P2 or even a HDR-system upon request. For transmission, the output signal is available in Serial Digital Video and of course Analogue Component/Composite. The audio-signals are available in Analogue-audio (XLR), AES/EBU or SDTI embedded-audio if necessary.

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4. Brief Acquaintance Mobile Unit 2

Although it is not mandatory for production, the micro-cam system also has a second unit, also a Renault Espace, that can be modularly equipped, feeding the needs of a specific production. In the same way as unit 1, the 2 is also equipped with autonomous UPS, heating and airco and Intercom-terminal. It can be equipped as a VTR-mobile (when for example a production has an extensive VTR-requirement with PGM/ISO/FEED/...), when a prompter is installed as a separate operator or even as a audio ob-van when the audio-mixing is included in the package. Shortly, this unit hasn't a fixed set-up and is installed previous to a job in accordance with customer requests.

5. Vocal Communication

The Micro-Cam Unit, is evidently equipped with a Intercom System. The Zeus Intercom Matrix is the core-component of our Intercom. It complies with the 4-wire cabling standard and is software configurable with a laptop-computer. Connected to it are all the key panels (Unit 1, Unit 2 or any other position on-set) and is the wireless intercom-system. This one operates 4 wireless belt packs and can

operate to the Zeus or in a stand-alone configuration. Separately from this system, the Micro Cam has 4 Kenwood RF-portables.



6. Conclusion



The content of this document is certainly not absolutely stating what you're going to get when ordering a package. It is solely a basic set-up from which most production configurations originate. Both the Unit-1 and Unit-2 (if needed) are quite modular to build in the prospect of any given project. With other words, it is best to contact one of our representatives for specific analysis of 'what we can do for you' conducted by artistic, technical and of course budgetary needs.

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