ICOP Model 20/20-W

System Components

Each *ICOP Model 20/20-W* system is standard with all of the following items:

- The Digital Video Recorder (DVR), hard drive, monitor, and all of the system controls are enclosed in a one-piece package that mounts in any standard double DIN radio compartment of the vehicle's dashboard.
- A built-in AM/FM radio.
- DVR with a removable 40 GB vehicle-grade hard drive mounted in a shock resistant case. Access to hard drive is password protected.
- One miniature color CCD camera with 40:1 digital zoom plus a third camera, and a micro B&W compact camera for recording in the rear seat (third camera (color) to point out back window is optional).
- One internal microphone.
- Wireless microphone system consisting of one transceiver - with one wireless remote and a hard-wired charger station, (capable of operating two remotes). The system records two separate audio channels (one each for the internal and external mics).
- Integrated, built-in GPS.
- Integrated color LCD monitor.
- All cables and hardware required for basic installation.
- A small interconnect module (junction box) houses all external connections to the DVR.
- Operating instructions manual - a full and complete set of operating instructions is furnished with each unit.

System Features & Specifications

- Support wireless upload capability (with optional multi-function router). Open architecture allows for future upgradeability to new technologies.
- Supports ethernet upload capability (with optional multi-function router). Connection from inside vehicle to an existing ethernet network infrastructure.
- Includes a MARK button to allow the officer to "mark" important events by simply depressing this button. The system can search by the "marked" event and recall instantly with display of GPS coordinates.
- The control unit protects recorded segments to ensure they are not recorded over or become erased. The Operator is prevented from erasing files from the recorder unit.
- Interfaces with most radar units. (with optional cable).
- Records from two cameras simultaneously (standard). An optional third camera is also available (record from two).
- Provides 60-second pre-event recording from two cameras simultaneously. (Pre-event audio may be enabled or disabled by the administrator)
- Record at 30, 15 or 10 frames per second with standard VGA quality resolution 4CIF (720x480), Full VGA (640 x 480), or ¼ VGA.
- Includes the capability to view and/or playback from any camera (that has recorded) within the vehicle.
- Utilizes easy-to-use menus to customize operational setup features.
- Display screen data is customizable, allowing user to select as much or as little information as desired on the screen. Metadata information is still captured for every video frame during recording even if no text is selected to appear on the display screen.

- Includes a Docking Station (adapter) to enable video transfer to the server, either directly or via networked workstation.
- System is password protected to prevent tampering and/or unauthorized access.
- System software updates are sent directly from ICOP when available, typically via email. Updates may be performed automatically upon re-insertion of the hard drive following an upload. Alternately, updates may be performed by inserting a USB thumb drive into junction box.
- Hard drive can be removed and downloaded without being full and without jeopardizing any previously recorded segments. When the hard drive is re-inserted the system determines the available capacity left and calculates the time remaining for new recordings and displays this number on the monitor.
- Automatically and instantaneously finds the blank space on the hard drive whenever recording is activated. No previous recording can be recorded over.
- The complete system is small enough that no items are mounted in the vehicle's trunk.
- No part of the system interferes in any way with the driver's field of view.
- Operating range of -22° F to 176° F.
- Non-operating range of -40° F to 185° F.
- Incorporates audio feedback to indicate the recorder's operational condition to the operator.
- The *ICOP Model 20/20-W* operates from a standard automotive supply of 11-15 Volts, negative ground. The system operates from the standard automotive harness connection to AM/FM radio. The system obtains power and access to car audio speakers through this connection. It also uses the standard radio fuse in fuse block.

Recorder Activation and Control

- The recording system is activated by any of the following:
  - Emergency lights or siren activation.
  - Manual On/Off record switch on the control unit.
  - Remotely by activating the audio transmitter(s).
  - Vehicle Speed *(optional setting)*
  - Auxiliary input activation – up to 3. (eg. Crash sensor, door lock, etc.)

Video Compression

- Proprietary compression software with video authentication by a timestamp embedded in the video. The software eliminates any possible attempts to alter, change, or eliminate recordings.
- Includes an EVENT ID feature that allows a 9 digit case number and 4 digit case code for case classification – keep/no keep, reason for stop, gender and race.
- All captured video stores metadata to track all captured data during video recording. This data includes siren status, brake status, vehicle speed, radar speed, GPS location, date, time, officer id, vehicle id, Event ID, etc.
- The recorded information is recorded in a propriety compression format to prevent unauthorized access and editing of video (There is also a non-proprietary format available if desired). This proprietary compression also enables true-image video on every captured frame. Most current compression standards remove data from frame to frame, thereby discarding actual video data.

Cameras

The ICOP Model 20/20-W uses the Sony FCB-1X11A Super HAD color CCD:

- Sony Super ¼" Hyper HAD image sensor resists night-time blooming and smearing from light sources.
- Camera is not subject to burn in, introduction of geometric distortion, not be affected by magnetic fields, and is highly resistant to damage from vibration and shock.

- Operates on 12 VDC, offers a screen resolution of 640 by 480 lines horizontal resolution, and illumination of 1 lux.
- Dimensions (including lens): 2.1" x 2.0" x 3.75" w/h/d.
- Operating temperature of 0°C to 50°C.
- Incorporates an auto iris, fixed focus, and motorized zoom lens.
- Lens includes a minimum of 10X optical zoom lens and 4X digital zoom for a total zoom ratio of 40:1. The effective focal range of the lens is 4.2mm (wide) to 42 mm (tele).
- The auto iris lens automatically adjusts for varying light levels from day to night.
- Angle of view: 46 degree (wide) to 5 degree (tele).
- Working distance: 10 mm (wide) to 1000 mm (tele).
- The horizontal field of view is greater than 17 feet at a distance of 20 feet from the camera.
- Auto focus capabilities.
- Auto white balance.
- Auto backlight compensation.
- Signal to noise ratio > 50dB.
- Video system's external record/microphone indicator. This indicator consists of an LED built in to the front of the camera's housing to indicate to an officer outside the vehicle that the recorder is recording and that audio from the wireless transmitter is being received. (This is an administrative select that may be turned on or off by the administrator).
- Mounts with a heavy-duty controlled pivot mount that does not obstruct the driver's field of view.
- Mount allows the camera to be positioned easily and secured in place without tools.
- Camera can be rotated 360 degrees and can pan and tilt to +/- 75 degrees.
- The camera lens has the capability of recording a properly mounted license plate at a distance of 25 feet or less allowing it to be easily read during in-vehicle playback without the need for electronic enhancement. This is accomplished through the use of an operator initiated automatic zoom feature that momentarily limits the field of view and then returns to the preset (normal) view.
- The camera is designed to be mounted on the interior top portion of the patrol car adjacent to the windshield. If the camera is a windshield mount, an adapter is provided in order to mount the camera to the interior top portion of the patrol car. A mounting device allows it to swivel 350 degrees horizontally. The mounting allows for manual adjustment vertically and laterally. The mounting device is designed and installed in such a manner as to prevent movement and vibration of the camera to a reasonable degree during operation of the vehicle. The use of tools is not required to reposition the aim or field of view of the camera. The camera does not interfere with or interfered by the vehicle passive restraint system (air bags).

Back-Seat (Suspect) Black & White Camera

- The back-seat camera is a micro compact with wide angle and 1/3" Sony Super HAD image device, 420 lines of resolution, and minimum illumination of 0.05 LUX (black & white). This is included with the system at no extra charge.
- Dimensions for the back-seat camera: 1" x 1" x 1.5" (w/h/d).

Color Monitor

- The integrated color LCD monitor, measures 3.8".
- High quality color LCD monitor with a non-reflective screen.

- Provides controls for power, volume and brightness.
- Monitor can be easily dimmed or brightened.
- Monitors audio and video whether or not the system is recording.
- All controls are illuminated for ease of use during nighttime operation.

Microphone System (Internal and Wireless Microphones)

- The internal microphone allows audio recording of normal speech within the interior of the vehicle, independent of the remote audio transmitters. The interior microphone actively records whenever the system is in the record mode.
- Audio from the interior microphone and the remote audio transmitter(s) record on separate channels.
- The output of the transmitters does not interfere with other radio equipment in use in the patrol vehicle.
- Employs FHSS (Frequency Hopping Spread Spectrum) technology in the 900 MHz band providing interference-free, secure communications for up to 1,000 users at a scene. Several million different codes/IDs shall be available for use with the transmitters to ensure that no two transmitters use the same code.
- Offers digitally controlled audio and uses FHSS (Frequency Hopping Spread Spectrum) technology to ensure that transmissions from the officer to the car are private and interference free. FCC approved frequencies in the 900 MHz band shall be used.
- Employs FHSS (Frequency Hopping Spread Spectrum) technology to allow up to 1,000 users at a scene. Several million different codes/IDs are available for use with the transmitters to ensure that no two transmitters use the same code.
- Auto-sync is achieved when remote transceiver in inserted into charger.
- Has the ability to synchronize communication between the in-car and remote transceivers when "SYNC" button is pushed and the remote transceiver is in the charger.
- In-car station consists of battery re-charger, transceiver with integral antenna (mounts above rear-view mirror or on side console), RJ-45 connector for attachment to the junction box, 12v power connector.
- Remote transceiver can be carried by officers on their belt, in their shirt pocket or attached to their shoulder strap. It is self-contained and includes a re-chargeable battery, internal microphone, internal antenna, connector for external mic., On Standby/Off switch, Transmit/Standby switch, Officer Help button and a LED indicator light.
- The remote transceiver can be switched between Transmit, On/Standby, and Off. In the Transmit mode the wireless transceiver is fully operational and is transmitting and receiving continuously. In the Standby mode the transmitter is turned off and the unit can only receive. In the Off mode all power is removed from the unit. (The administrator can set the desired operating mode)
- Officer Help button – transmits signal to transceiver to instruct police radio to send a synthesized voice help message with GPS coordinates to radio dispatch. Also, when depressed it activates video and audio recordings if not activated.
- Remote transceiver will operate from a NIMH battery pack with up to 9 hours continuous operation on a single charge and up to 110 hours of Standby operation. The following battery chargers shall be included with each wireless microphone system: (1) hard-wired charger in car, (2) 110 Volt charger, and (3) cigarette charger.
- The transmitting and receiving capabilities of the system shall be such that clear normal speech audio recordings can be made at distances of at least 1,000 feet in all climate conditions.

Quality Control and Testing

- All electrical components utilized, including integrated circuits, are a high reliability commercial grade part.

- Each individual electrical and electronic component is subjected to a complete quality control inspection. This is required before installation into printed circuit board or other sub-assembly.
- All assembled printed circuit boards and sub-assemblies are thoroughly inspected and completely tested mechanically and electrically before installed into video system.
- All printed circuit boards use glass epoxy, type FR4 or equivalent. Also all high-density circuit boards are the solder mask type.
- All components dissipating power in excess of one watt and mounted directly against a circuit board have adequate heat sinks for circuit board protection. All electronic and electrical components are only be utilized within their manufacturer's operating specifications, pertaining to voltage, current and heat dissipation characteristics.
- Each complete video system is individually bench tested for all functions and test parameters.