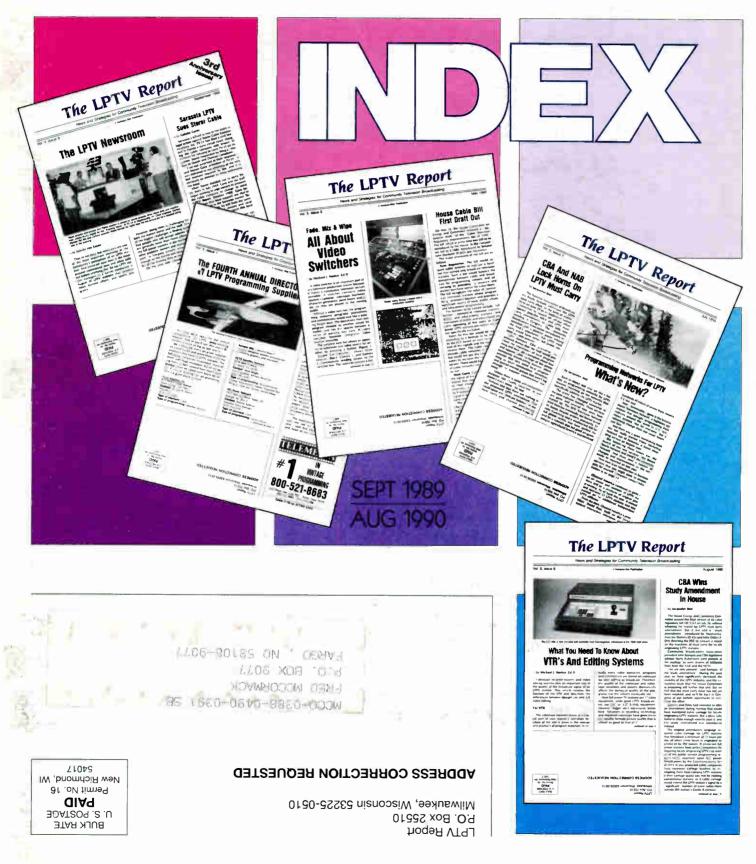
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News and Strategies for Community Television Broadcasting

Vol. 5, Issue 11

A Kompas/Biel Publication

November 1990





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Here is your 1990 LPTV Report INDEX, a guide to every article that has appeared in the magazine from September 1989 through August 1990.

To make the Index as easy as possible to use, we've listed all articles, except "Supplier Side" entries, in a general index— the SUBJECT INDEX—beginning on page 6. Products and services featured in the monthly "Supplier Side" columns (but not the "Supplier Solos") are listed separately by product type in the SUP-PLIER SIDE INDEX beginning on page 14.

The SUBJECT INDEX is divided into categories by subject, and entries are arranged alphabetically within categories by title. Entries in the SUPPLIER SIDE INDEX are arranged alphabetically by company name within general product categories.

Articles that appeared prior to September 1989 are listed in the November 1989 INDEX. Copies of this INDEX, as well as back issues or photocopies of any article, are available from our office. Please contact Katie Reynolds at (414) 781-0188 if you want to order any of these.

This year, we are also including a directory of Federal Communications Commission personnel and a glossary of video terminology, along with our regular "At the FCC" feature, and, of course, the classified ad pages. As space permits each year, we will be adding other reference features until this November issue becomes a truly useful desk guide for the community television broadcaster.

Let us know what you think.

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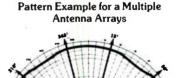
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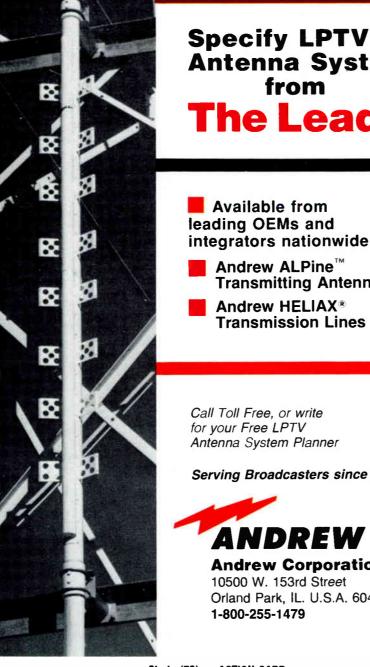
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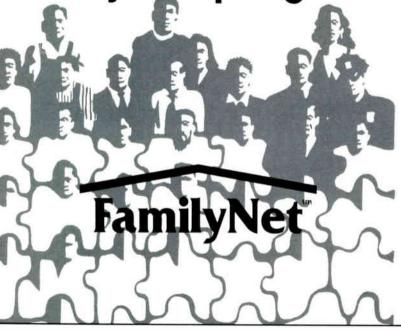
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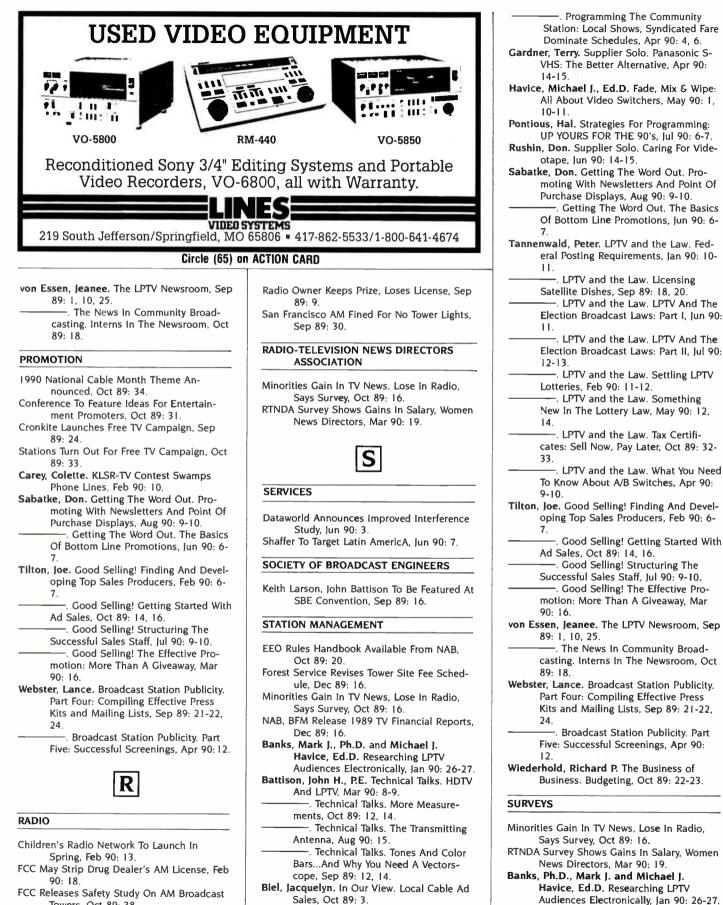
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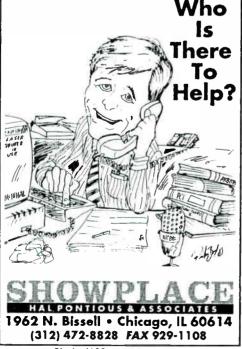
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A Glossary of Video Terminology

А

A/B Roll Editing: This takes selected odd (Aroll) and even (B-roll) shots from two VCR's and puts them on a tape in a third VCR in the proper sequence.

A-B Split Screen: A visual means for comparing two sources simultaneously. Permits a fast visual check of the phase and sync timing between two inputs.

A-to-D Converter (ADC): A device used to convert analog signals to digital signals.

Aberrations: Certain aberrations degrade the image formed by a lens.

Aliasing: Undesirable "beating" effects caused by sampling frequencies that are too low to faithfully reproduce image detail. Examples are:

 Temporal aliasing—for example, wagon wheel spokes apparently reversing; also the movement jitter seen in standards converters with insufficient temporal filtering.

2) Raster scan aliasing-the twinkling effects on sharp horizontal lines.

Raster scan aliasing and its horizontal equivalent are often seen in older digital effects devices as detailed images are compressed, due to insufficient filtering. Aliasing is also often used to describe the unpleasant stepped images that occur if unfiltered angled lines are presented upon the raster lines of a TV system. **Analog, Analog Components:** Video signals in which a continuously variable voltage or current (rather than a set of numbers) represents the value of a pixel.

Aperture: The opening of a lens which controls the amount of light reaching the surface of the pickup device. The size of the aperture is controlled by the iris adjustment. As the f stop number (f/1.4, f/1.8, f/2.8, etc.) increases, less light is permitted to pass through to the pickup device.

Assemble Editing: In assembly editing, new material is added to the end of a previously recorded portion.

Astigmatism: The uneven foreground and background blur in an image.

ATV: Advanced TV. Generic name for high definition TV and other proposed future broadcast system technologies.

Automatic Light Control (ALC): The process by which the illumination on the face of the pickup device is automatically adjusted to the brightness of the scene.



Backcoating: A special treatment applied to the backside of magnetic tape to enhance gripping action and improve tape transportation. **Background:** The setting behind the scene. **Back Light:** A fixture that is often not properly applied or overlooked completely. The main function of the back light is to separate the individual subjects from the background and give them depth and dimension.

Backing: The mylar or plastic tape on which the magnetic coating is applied.

Barn Doors: Movable black metal panels attached to the sides of a lighting fixture with which light coverage can be controlled.

Base and Fill Lights: Base and fill lights, commonly referred to as "scoops," provide a softedged field of light which is used to provide basic illumination of the subject, to fill in the areas not highlighted by the key light, to illuminate the background, and to soften shadows caused by key lights.

Betacam, Betacam Format: Portable camera/ recorder system and related equipment originally developed by Sony; the name may also be used for just the recorder or for the interconnect format. Betacam uses a version of the (Y, R-Y, B-Y) component set.

Betacam SP: A Superior Performance version of Betacam. SP uses metal particle tape and a wider bandwidth recording system. The interconnect standards are the same as those for Betacam; there is also limited tape interchangeability with standard Betacam.

Black, also **Color Black**, **Blackburst**: 1) A composite color video signal. This signal has composite sync, reference burst, and a black video signal which is usually at a level of 7.5 IRE (.05V) above the blanking level. 2) Fade-to-Black between scenes.

Black Level: The level of the video signal that corresponds to the maximum limits of the black areas of the picture.

Blanking, also Composite Blanking: Related to composite sync, this signal has both horizontal and vertical components and is at its negative level whenever video is to be blanked or turned off.

Blanking Level: Also known as pedestal, it is the level of a video signal which separates the range that contains the picture information from the range that contains the synchronizing information. The level of the front and back porches. Zero IEEE units.

Body Brace: A frame to support camera. **Bridging:** A term indicating that a high impedance video line is paralleled, usually through a switch, to a source of video.

Brightness Ratio: The difference between the



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brightest and darkest object in a scene. Too extreme a difference can lead to an unacceptable contrast ratio.

Brightness Signal: Same as the luminance signal (Y); the signal that carries information about the amount of light at each point in the image.

С

C-Mount: A C-Mount is generally the standard means of attaching a lens to a camera. Normally, a C-Mount uses a 1/32" thread. With a C-Mount, the dimension from the banking shoulder of the lens mounting thread to the image plane of the camera is 0.690" regardless of the kind of lens used.

Calendering: A process by which magnetic tape is squeezed between two special rollers under a controlled environment for producing a smooth and glossy tape surface.

Candlepower: The unit measure of an incident light.

CAV (Component Analog Video): Component video signals in which an analog voltage or current (rather than a set of numbers) represents the value of the pixel; the same as "analog components."

CGA: Color Graphics Adaptor.

Character Generator: Reproduces recognized font styles from a computer type keyboard. Usually provides multiple screen storage and is capable of background colorization from video display.

Chroma: The color information contained in a

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video signal, consisting of hue (phase angle) and saturation (amplitude) of the color subcarrier.

Chroma Keying: The process of overlaying one video signal over another, the areas of overlay being defined by a specific range of color, or chrominance, of one of the signals. For this process to work, the chrominance must have sufficient resolution, or bandwidth. Coded (composite) video systems do not have sufficient bandwidth for acceptable quality chroma keying; hence, analog chroma keyers typically use RGB sources.

Chrominance: The color part of a signal, relating to the hue and saturation but not to the brightness or luminance of the signal. For example, black, gray, and white have no chrominance, but any colored signal has both chrominance and luminance. U,V: Cr,Cb: I,Q: (R-Y), (B-Y) represent the chrominance information of a signal. See also: YUV and YIO. **Clipping:** The process of shearing off the peaks

BON MOT

This above all: To thine own self be true,

And it shall follow, as the night the day,

Thou canst not then be false to any man.

Polonius

of either the white or the black excursions of the video signal.

Color Burst: A few (8 to 10) cycles of 3.58 MHz color subcarrier which occur during the back porch interval. Color burst amplitude is 40 IEEE units and phase is 180°. The color oscillator of a color television receiver is phase locked to the color burst.

Color Correction: A process in which the coloring in a television image is altered or corrected by electronic means. Care must be taken to ensure that the modified video does not exceed the limits of subsequent processing or transmission systems.

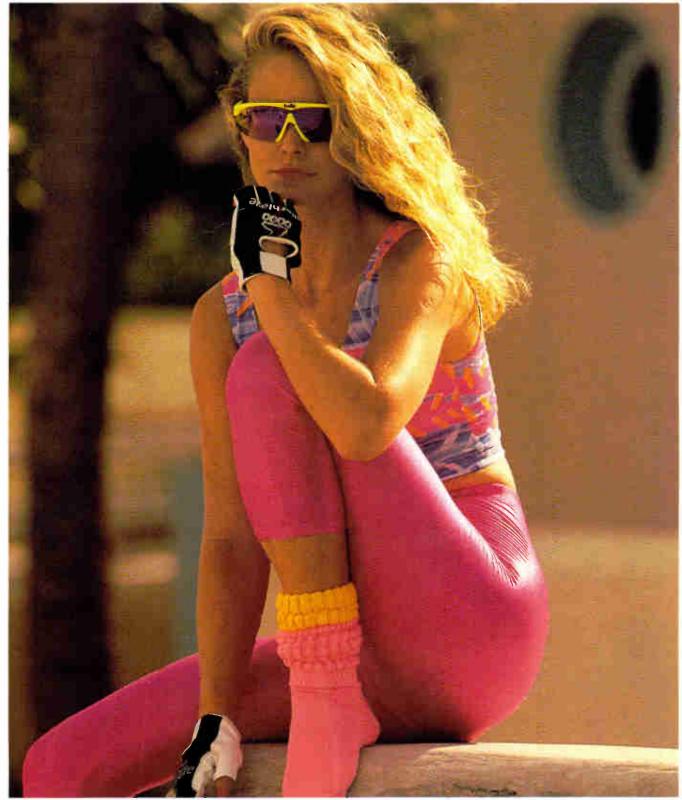
Color Phase: The correct timing relationship within a color display. Color is considered to be "in phase" when the hue is reproduced correctly.

Color Subcarrier: The 3.58 MHz signal that carries color information. This signal is superimposed on the luminance level. The amplitude of the color subcarrier represents saturation, and phase angle represents hue.

Component: The normal interpretation of a component video signal is one in which the luminance and chrominance are sent as separate components—e.g., analog components in M-II and Betacam VTR's, digital components Y,Cr,Cb in CCIR rec 601. RGB is, however, also a component signal. Component video signals retain maximum bandwidth, unlike composite systems.

Composite: A composite video signal is one in which the luminance and chrominance information have been combined using one of the coding standards: NTSC, PAL, SECAM, etc. **Composite Sync:** A signal comprising horizon-

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tal sync pulses, vertical sync pulses, and equalizing pulses only, with a no-signal reference level.

Composite Video: A mixed signal composed of the luminance (black and white), chrominance (color), blanking pulses, sync pulses, and color burst.

Contrast: The range of light and dark values in a picture, or the ratio between the maximum and the minimum brightness values. Low contrast is shown mainly as shades of gray, while high contrast is shown as blacks and whites with very little gray. It is also a TV monitor adjustment which increases or decreases the level of contrast of a televised picture.

Control Track: The portion along the length of a video tape on which sync control information is placed and used to control the playing back of the video signal.

Cross Color: A defect that manifests itself as spurious rainbow patterns on highly textured objects like the one found on a striped shirt or tweed jacket. Cross-color defect is attributed to the make-up of the NTSC signal which mixes the high luminance and chrominance information in the same composite baseband spectrum.

Cross Luminance: More generally referred to as "Dot Crawl," this defect appears as a dot pattern crawling up or hanging on the edges of color areas. This is also a result of the NTSC signal structure where the color information leaks into the luminance signal.

Cyclorama Lights: Cyclorama lights are designed to create a smooth lighting effect on a backdrop or cyclorama.

D

D-to-A Converter (DAC): A device used to convert digital signals to analog signals. **Decoder:** A device used to recover component

signals from a composite (encoded) source. Decoders are used in displays and in various processing hardware where component signals are required from a composite source, i.e., composite chroma keying of color correction equipment, etc.

Degauss: To demagnetize recording and playback heads or tape.

Delay Line: An artificial or real transmission line or equivalent device designed to delay a wave or signal for a specific length of time.

Demagnetize: To remove magnetism, to erase magnetic tape. Also see **Degauss**.

Demodulator: TV demodulators strip the video and audio signals from the carrier frequency. The composite video and audio can then be used as any other video or audio feed for studio use.

Depth of Field: The front to back zone in a field of view which is in focus in the television scene. With a greater depth of field, more of the scene, near to far, is in focus.

Digital: Representation of data by discrete characters which can be regenerated easily with a minimum of noise and distortion.

Digital Components: Component signals in which the values for each pixel are represented by a set of numbers.

Dolly: A wheeled platform upon which a tripod is set to move cameras toward or away from the scene.

Drop-Out: Missing information from magnetic tape. Caused by dust, lack of oxide, etc. **Dubbing:** Transcribing from one recording medium to another.

EBU: European Broadcasting Union. Edit: To alter originally recorded material to

prepare for presentation. Edit Code: A tape retrieved code added to original recorded material utilizing a time structure—for example, SMPTE time code. EGA: Enhanced Graphics Adaptor.

EIA: Electronic Industries Association (formerly RMA or RETMA). The organization that determines recommended audio and video standards in the U.S.

EIA Sync: RS-170 sync. The standard waveform for broadcast equipment in the United States. Encoded: The encoded video signal is formed by starting with an RGB signal from the color television camera. This RGB signal is then processed through an 1 and Q encoder which converts the RGB into a composite NTSC signal. The encoded signal has all of the elements of the composite video signal: sync, burst, chroma, and luminance.

Encoder: A device that superimposes electronic signal information on other electronic signals.

ENG: Electronic News Gathering.

Equalizer: (A) Equipment designed to compensate for loss and delay frequency effects within a system. (B) A component, or circuit, which allows for the adjustment of a signal across a given band.

F

Field: One-half of a television picture. One complete vertical scan of the picture, containing 262.5 lines. Two fields make up a complete television picture (frame). The lines of Field I are vertically interlaced with Field 2 for 525 lines of resolution.

Fill Light: A fill light is used in studio lighting to mask the "mistakes" created by the individual doing the lighting. It is the job of the fill light to cover up and fill the shadow created by the key light.

Film Chain: Projectors, multiplexers, and a camera; used to transfer film to video.

First Generation: The first time the signal is recorded on tape, that tape is called a first generation recording.

F Number: In lenses with adjustable irises, the maximum iris opening is expressed as a ratio— (focal length of the lens)/(maximum diameter of aperture). This maximum iris will be engraved on the front ring of the lens.

Focal Length: The distance from the center of the lens to a plane at which point a sharp image of an object viewed at an infinite distance from the camera is produced. The focal length determines the size of the image and the angle of the field of view seen by the camera through the lens. That is the distance from the center of the lens to the pickup device.

Format: In video recording—C, U-Matic, Betacam, M, Betacam SP, M-II, D1, D2, Beta, VHS, Hi8, 8 mm, and S-VHS are all current formats. Frame: (A) The total area of the picture which is scanned while the picture signal is not blanked. (B) A complete TV picture consisting of two fields; a total scanning of all 525 lines of the raster area; occurs every 1/30 of a second. (A frame is 625 lines and occurs every 1/25 second in Europe and many other countries.) Fresnel Lens: A specially constructed lens which produces a soft-edged concentration of light; used as a lens in a spotlight lamp housing.

G

GBR, **GBR** Format: The same signals as RGB. The sequence is rearranged to indicate the mechanical sequence of the connectors in the SMPTE standard.

Gamut: The range of voltages allowed for a video signal. Signal voltages outside of the range (i.e., exceeding the gamut) may lead to clipping, crosstalk, or other distortions.

Generations: The number of times a video clip is copied or processed. In analog systems, extensive efforts are made to keep generations to a minimum, since each copy or process adds noise and other artifacts. In digital systems, however, this requirement is no longer necessary, because each copy can potentially be perfect. This enables digital systems to work in quite different ways from analog systems.

Genlock: Genlock is a process of sync generator locking. This is usually performed by introducing a composite video signal from a master source to the subject sync generator. The generator to be locked has circuits to isolate vertical drive, horizontal drive, and subcarrier. The subject sync generator is then locked to the master subcarrier, horizontal, and vertical drives so that the result is that both sync generators are running at the same frequency and phase.

Chost: A shadowy or weak image in the received picture, offset either to the right or to the left of the primary image. It is the result of transmission conditions where secondary signals are caused by a reflected RF signal.

Gray Scale: A series of tones ranging from true black to true white. It is usually expressed in ten steps.

Grid: A crosshatch of metal pipes for hanging lights in a studio.

Ground: An electrical connection to the earth, generally through a ground rod. Also a common return to a point of zero potential, such as a metal chassis, a terminal, or a ground bus.

Η

HDTV: High Definition Television. The Society of Motion Picture and Television Engineers in the United States and the BTA in Japan have proposed a high definition television product standard:

1125 lines at 60 Hz field rate 2:1 interlace;

16:9 aspect ratio;

30 MHz RGB and luminance bandwidth;

Tri-level syncs.

HGA: Hercules Graphics Adaptor.

Hi8: An 8 mm professional NTSC recording format.

Horizontal Blanking: The blanking signal that is produced at the end of each scanning line. Horizontal Drive or Horizontal Sync: The signal is derived by dividing subcarrier by 227.5 and then doing some pulse shaping. The signal is used by monitors and cameras to determine the start of each horizontal line.

Horizontal Resolution: The smallest increment of a television picture that can be discerned in the horizontal plane. This increment is dependent upon the video bandwidth and is measured in frequency.

Hue: (A) Distinction between colors. Red, blue, green, yellow, etc. are hues. White, black,

and gray are not considered hues. (B) The dimension of color that is referred to a scale of perceptions ranging through the spectrum from red, orange, yellow, green, blue, purple, and back to red.

Ι

IEEE: Institute of Electrical and Electronic Engineers.

IEEE Scale: A waveform monitor scale with the IEEE standards and the recommendations of the TV broadcasters and manufacturers for coordination of Video Levels.

Iris: The amount of light transmitted through a lens is controlled by an adjustable diaphragm, or iris, located in the lens barrel. The opening is referred to as the aperture, and the size of the aperture is controlled by rotating the aperture control ring on the lens barrel. The gradations on the lens barrel are expressed in terms of the focal length (f) of the lens divided by the diameter of the aperture at that setting. This ratio is called the f-number.

Interface: (A) To connect two or more components to each other so that the signal from one is supplied to the other(s). Feeding a signal between units that run on different standards. (B) The place where two systems or a major and a minor system meet and interact with each other.

J

Jitter: Small and rapid variations in a waveform due to mechanical disturbances, changes in the characteristics of components, supply voltages, imperfect synchronizing signals, circuits, etc.

К

Kelvin: Also expressed as Kelvins or K, the unit of measurement of the temperature of light. In color recording, light temperature affects the values of the lights and the scene that they illuminate.

Keying: The process of replacing part of one television image with video from another image, i.e., chroma keying and insert keying.

Key and Back Lights: Key and back lights provide the main source of illumination on the subject from the front, side, and rear. The most important lighting fixtures in the studio, they must provide maximum variety in beam shape and size and be easily adjusted to meet different lighting requirements.

L

Legal Signal: A video signal in which each component remains within the limits specified for the video signal format (i.e., does not exceed the specified gamut for the current format).

Looping: A term indicating that a high impedance device has been permanently connected in parallel to a video source.

LTC (Longitudinal Time Code): This is another expression for the SMPTE time code signal recorded onto the third audio track of a video cassette tape. continued

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Lumen: A measurement of light quantity, taken at the source of light, against a predetermined constant. Lumens per square foot equals footcandles.

Lux: A unit measuring the intensity of light (1 Footcandle 10.76 Lux).



M, **M** Format: A portable camera/recorder system developed by Panasonic; also used for just the recorder or the interconnect format. "M" actually refers to the manner in which the video tape is wrapped around the head drum. M format systems employ the (Y, R-B, B-Y) component set.

M-II, M2, M-II Format: A second generation camera/recorder system developed by Panasonic; also used for just the recorder or the interconnect format. M-II uses a version of the (Y, R-Y, B-Y) component set.

MAC (Multiplexed Analog Components): A system in which the components are time multiplexed into one channel using time domain techniques, i.e., the components are kept separate by being sent at different times through the same channel. There are many different MAC formats and standards.

Matte: A film term sometimes used in video production work to denote a keyed effect, an insert of video signal information keyed from one source into a second video signal.

Metal Tape: Tape using iron in its pure metallic form, instead of as an oxide, and offering excellent frequency response and wide dynamic range.

Minicam: Describes lightweight, often selfcontained portable ENG type cameras. Also Microcam or Camcorder.

Moire: (A) A wavy or satiny effect produced by the convergence of lines. It usually appears as a curving of the lines in the horizontal wedges of a test pattern. It is a natural optical effect when converging lines in a television picture are nearly parallel to the scanning lines. (B) An optical disturbance caused by the interface of similar frequencies. **Monitor:** (A) A television that receives its signal directly from a VCR, camera, or separate TV tuner for high quality picture reproduction. Does not contain a channel selector. (B) A special type of television receiver designed for use with closed circuit TV equipment.

Monitor/Receiver: A combination of monitor and TV receiver capable of accepting composite video signals directly from VCR's, cameras, or those video signals broadcast as RF; also capable of producing a demodulated video signal output from an off-air input signal.

Monochrome Signal: A "single color" video signal; usually a black and white signal or, sometimes, the luminance portion of a composite or component color signal.

Multiplexer: An optical system allowing a number of film and slide projectors to feed video information into the same video camera.

Ν

Neutral Colors: The range of gray levels, from black to white, but without color. For neutral areas in the image, the RGB signals will all be equal; in color difference formats, the color difference signals will be zero.

NTSC (National Television System Committee): The organization that formulated the NTSC system. Usually taken to mean the NTSC color television system itself, or its interconnect standards.

NTSC Color Bars: A pattern generated by the NTSC Generator, consisting of eight color bars of equal width. Colors are white (75%), black (7.5% set-up level), 75% saturated pure colors (red, green, and blue), and 75% saturated hues of yellow, cyan, and magenta (mixtures of two colors in a 1:1 ratio without a third color).

0

Overscan: The TV picture beyond the area of normal screen size.

Paint Pots: Or rheostats. Controls on a colorizer for mixing colors electronically.

PAL (Phase Alternate Line): A composite color standard used in many parts of the world. The phase alteration makes the signal relatively immune to certain distortions (compared to NTSC).

PGA: Professional Graphics Adaptor.

Pixel (Picture Element or Pix Element): Related to a particular image address in digital systems or to the smallest reproducible element in analog systems.

Primary Colors: Colors, usually three, which are combined to produce the full range of other colors within the limits of a system. All nonprimary colors are mixtures of two or more of the primary colors. In television, the primary colors are specific sets of red, green, and blue. Pulse: A current or voltage that charges abruptly from one value to another and back to the original value in a finite length of time. Used to describe one particular variation in a series of wave motions.

Pulse Distribution Amplifier: An amplifier designed to boost the strength of the sync as well as other control signals to the proper level for distribution to a number of cameras, special effects generators, and terminal equipment.

R

Raster: The rectangular pattern of scanning lines upon which the picture is produced. The illuminated face of the TV monitor without the video information present.

Readout: A visual display of stored information.

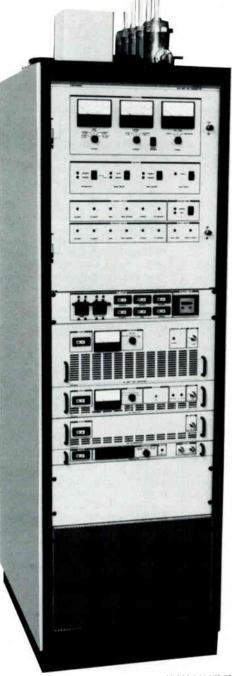
Reflected Light: The scene brightness or the light being reflected from a scene. Usually it represents 5% to 95% of the incident light, and it is expressed in footlamberts.

Registration: An adjustment on color TV sets



Ρ

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and projection television systems to ensure that the electron beams of the three primary colors of the phosphor screen are hitting the proper color dots/stripes; also, a similar adjustment of the tubes in color cameras.

Resolution: (A) A measure of the ability of a camera or television system to reproduce detail—that is, the number of picture elements that can be reproduced with good definition. It is a factor of the pickup device or the TV CRT characteristics and the video signal bandwidth. (B) Generally called horizontal resolution. It can be evaluated by establishing the limit in which lines can be distinguished on a test pattern. A larger resolution value means a broader frequency band of the video signal. (C) A measure of the greatest amount of detail that can be seen, or resolved, in an image. It is often incorrectly expressed as a number of pixels on a given line. More correct is the bandwidth.

RGB, RGB Format, RGB System: Red, green, and blue. The basic parallel component set, in which a signal is used for each primary color; or the related equipment or interconnect formats or standards. The same signals may also be called "GBR" as a reminder of the mechanical sequence of connections in the SMPTE interconnect standard.

Rise Time: The time taken for a signal to make a transition from one state to another, usually measured between the 10% and 90% completion points of the transition. Shorter, or "faster" rise times require more bandwidth in a transmission channel.

RS-170A: EIA technical standard NTSC color TV.

Safe Title Area: 80% of the TV screen, from the center of the screen; that area of the display screen (and therefore of the camera scanning area) that will reproduce legible title credits no matter how it is adjusted.

Scanning: The rapid movement of the electron beam in a pickup device of a camera or in the CRT of a television receiver. It is formatted in a line-for-line manner across the photo-sensitive surface that produces or reproduces the video picture. When referred to a video surveillance field, it is the panning, or the horizontal camera motion.

Scoop: A large bowl-shaped unit—often made of aluminum—into which a lighting unit is placed so that it will reflect light over a wide area.

SEG (Special Effects Generator): The SEG is used in multi-camera production and editing to change from one camera (or VCR) signal to another. Many different changes or "wipes" are possible. For this to work properly, all connected equipment must be driven by the same sync signal (often provided by a sync generator built into the SEG itself).

Signal-to-Noise Ratio (S/N): An S/N ratio can be given for the luminance signal, chrominance signal, and audio signal. The S/N ratio is the ratio of noise to actual total signal, and it shows how much higher the signal level is than the level of noise. It is expressed in decibels (dB), and the higher the value is, the more crisp and clear the picture and sound will be during playback.

S-MAC: A MAC standard proposed for studio intraconnection by the SMPTE working group on Component Analog Video Standards. The S-MAC system uses time compression and time domain multiplexing techniques to convey Y, C_n, C_b video signals (a version of Y, R-Y, B-Y).

SMPTE: Society of Motion Picture Television Engineers.

SMPTE Format, SMPTE Standard: In component television, these terms refer to the SMPTE standards for parallel analog component video interconnection. The SMPTE has standardized both RGB and Y, P,, P_b color difference systems. (Y, P,, P_b is a version of Y, B-Y, R-Y.)

Snow: (A) Random noise on the display screen, often resulting from dirty heads. (B) TV signal breakup caused by weak video reception.

Split Screen: A special effect utilizing two or more cameras so that two or more scenes are visible simultaneously on each part of the screen.

Staircase: A pattern generated by the NTSC generator, consisting of equal width luminance steps of 0, 20, 40, 60, 80, and 100 IEEE units and a constant amplitude chroma signal at color burst phase. Chroma amplitude is selectable at 20 IEEE units (low stairs) or 40 IEEE units (high stairs). The staircase pattern is useful for checking the linearity of luminance and chroma gain, differential gain, and differential phase.

Standard, Interconnect Standard: The specific signal configuration, reference pulses, voltage levels, etc. that describe the input/ output requirements for a particular type of equipment. Some standards have been established by professional groups or government bodies (such as SMPTE or EBU). Others are determined by equipment vendors and/or users.

Stripe Filter: A chrominance tube system in WorldRadioHistory which the target area of the tube is divided into sequential stripes for RBG and Y, and can therefore derive color signal by using only one pickup tube.

Subcarrier: Also SC, 3.58, 3.58 CW. This is the basic signal in all NTSC sync signals. It is a continuous sine wave, usually generated and distributed at 2 volts in amplitude, and having a frequency of 3.579545 MHz. Subcarrier is usually divided down from a primary crystal running at 14.318180 MHz, and that divided by 4 is 3.579545. All other synchronizing signals are directly divided down from subcarrier.

Subcarrier Phase Shifter: Special circuitry designed to control the phase relationships of the two portions of the encoded color signal so that they maintain their correct relationship during recording, transmission, and reproduction.

Sun Shade: A metal cylinder attached to the end of a lens to keep light from entering the lens from the periphery of the angle of view.

Switcher: A term often used to describe a special effects generator; a unit that allows the operator to switch between video camera signals. Switchers are often used in industrial applications to switch between video cameras monitoring certain areas for display on one monitor; these kinds of switchers do not have sync generators.

Sync, also Composite Sync. This signal is derived from a composite or combination of horizontal and vertical drives, with some slightly narrowed and delayed pulses as well as equalizing pulses. It is one of the more popular signals used in video systems today, and, when used, is usually accompanied by subcarrier.

Τ

Tape: A medium capable of storing an electronic signal. It consists of backing, binder, and iron oxide coating. The orientation of the iron oxide determines whether or not the tape can be used for helical scan video recording.

TBC (Time Base Corrector): This piece of equipment corrects the timing irregularities that occur during VCR playback. Time base correction is not necessary for direct playback from a VCR to a TV set.

Teleprompter: The trade name of a prompting device used in television studios.

Test Pattern: Optical guide for TV camera reference alignment.

Time Base Stability: The maintenance of the scanning process to very close tolerances.

Time Code Editing: By recording a sequential time code along with the video and audio material, a more precise reference for editing can be obtained. Each frame has its own number or code which tells the time in hours, minutes, and seconds, and includes a frame number. The world standard code is called SMPTE (for the Society of Motion Picture Television Engineers) and has also been adopted by the IEC (International Electrotechnical Commission). Time codes permit very fast and accurate editing. Automatic editing is possible under computer control.

Title Generator: Commonly a black and white camera is used to shoot titles which are electronically superimposed on the video picture while shooting or during editing. Title color can be selected and changed independently. More sophisticated equipment generates characters directly. **Tracking:** The angle and speed at which the tape passes the video heads.

Transcoder: A device used to convert from one component set to another, e.g., to convert Y, R-Y, B-Y signals to RGB signals.

Triaxial: This is a connector comprising three concentric conductors—an inner conductor, an intermediate conductor, and an outer conductor—separated by dielectrics.

Tripod: A three-legged stand upon which a camera is mounted.

Tripod head: The top portion of a tripod, where its legs meet and the camera is mounted. Both friction or fluid-head tripod designs are available.

Twinax: This is a connector which has two insulated inner contacts (male and female) surrounded by a common ground.

U

Underscan: Decreases raster size H and V so that all four edges of the picture are visible on the monitor. Allows viewing of skew and tracking which would not be visible in normal (overscanned) mode. Also helpful when aligning test charts to be certain they touch all four corners of the raster. Likewise, when checking the alignment of multiplexer images from a film chain, underscan allows proper framing of the projected image going into the video camera.

V

Valid Signal: A video signal that will remain legal when transcoded to any other format. A valid signal is always legal, but a legal signal is not necessarily valid. Signals that are not valid will be processed without problems in their current format, but problems may be encountered if the signal is transcoded to a new format.

VCR: Video Cassette Recorder.

Vertical Retrace: The return of the electron beam to the top of a television CRT screen or a camera pickup device target at the completion of the field scan.

Vertical Sync Pulse: A portion of the vertical blanking interval that is made up of blanking level and six pulses (92% duty cycle at -40 IEEE units) at twice the horizontal sync pulse repetition rate. The vertical sync pulse synchronizes the vertical scan of the television receiver to composite video signal. It starts each frame at the same vertical position. (Sequential fields are offset 1/2 line to achieve an interlaced scan.)

VGA: Video Graphics Array.

Video: Pertaining to picture signals in a television system.

Video Distribution Amplifier: A special amplifier for strengthening the video signal so that it can be supplied to a number of video monitors at the same time.

Video Tape Recorder (VTR): An electromechanical device capable of recording, storing, and reproducing an electronic signal which contains audio, video, and control information. Video Waveform: A pictorial display, on a special oscilloscope, of the various components of the video signal. Used to check the integrity of the signal and signal components.

Vectorscope: Round (green) oscilloscope to

align amplitude and phase of the three TV color signals (RGB).

Videocassette: A self-contained video module played on a specially designed video tape recorder; similar in design to an audio cassette; houses two reels—supply and take-up—with the tape running between them but connected to both.

Vertical Interval Time Code, (VITC): This is the same information as the SMPTE time code. It is superimposed onto the vertical blanking interval, so that the correct time code can be read even when a helical scanning VCR is in the Pause or Slow mode.

Video Tape Recorder (VTR): The term "VTR" includes both reel-to-reel and cassette types of recorders.

W

Waveform Monitor: Oscilloscope used to display the video waveform.

White Level Set: White set. A control that establishes the luminance level for a color camera.

Wipe: Term used to describe the SEG effect of replacing a portion of video signal A with video signal B; also, to erase a tape.

Y

Y, C1, C2: A generalized set of CAV signals: Y is the luminance signal, C1 is the first color differ-

ence signal, and C2 is the second color difference signal.

Y, I, Q: The set of CAV signals specified for the NTSC system: Y is the luminance signal, I is the first color difference signal, and Q is the second color difference signal.

Y, P_b, P_r: A version of Y, R-Y, B-Y specified for the SMPTE analog component standard.

Y, R-Y, B-Y: The general set of CAV signals used in the PAL system as well as for some encoder and most decoder applications in NTSC systems; Y is the luminance signal, R-Y is the first color difference signal, and B-Y is the second color difference signal.

Y, U, V: Luminance and color difference components for PAL systems; Y, B-Y, R-Y with new names; the derivation from RGB is identical.

Z

Zoom: A zoom lens is unique because its focal length can be changed while the object being viewed remains in focus. Thus, a zoom lens can bring distant objects into clear view in the same way that a telephoto lens can; and it can also view a scene in the same way as a wide angle lens.

Zoom Ratio: A mathematical expression of the two extremes of focal length available on a particular zoom lens.

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What's Going On

- January 3-5, 1991. Association of Independent Television Stations Annual Convention. Los Angeles, CA. Contact: Angela Giroux, Membership Director, (202) 887-1970.
- January 14-18, 1991. National Association of Television Program Executives 28th Annual Convention. New Orleans Convention Center, New Orleans, LA. Contact: Nick Orfanopoulos, Conference Director, (213) 282-8801.
- January 25-29, 1991. National Religious Broadcasters 48th Annual Convention and Exposition. Sheraton Washington Hotel, Washington, DC. Contact: Michael Glenn, Director of Sales, (201) 428-5400.
- February 1-2, 1991. Society of Motion Picture and Television Engineers 26th Annual Television Conference. Westin Detroit. Detroit, MI. Contact: Ann Cocchia, (914) 761-1100.
- February 10-15, 1991. National Association of Broadcasters 26th Annual Management Development Seminars for Broadcast Engineers. University of Notre Dame. South Bend, IN. Contact: Jane Frock, NAB Science and Technology, (202) 429-5346.
- February 11-13, 1991. Broadcast Cable Credit Association 25th Credit and Collection Seminar. Loews Summit Hotel. New York, NY. Contact: Mark Matz, Vice President-Marketing, (708) 827-9330.
- March 6, 1991. National Association of Black-Owned Broadcasters Awards Dinner. Washington, DC. Contact: James L. Winston, Executive Director, (202) 463-8970.
- March 24-27, 1991. National Cable Television Association Annual Convention. New Orleans, LA. Contact: (202) 775-3669.

April 13-15, 1991. Broadcast Education Association 36th Annual Convention. Las Vegas, NV. Contact: Louisa Nielsen, (202) 429-5355.

- April 15-18, 1991. National Association of Broadcasters Annual Convention. Las Vegas, NV. Contact: (202) 429-5356.
- April 21-24, 1991. Broadcast Cable Financial Management Association & Broadcast Cable Credit Association Annual Conference. Los Angeles, CA. Contact: Cathy Lynch, Meetings & Conventions Coordinator, (708) 296-0200.
- May 16-19, 1991. American Women in Radio & Television 40th Annual National Convention. Atlanta, GA. Contact: Diane Walden, Director of Advertising and Promotion, (202) 429-5102.
- June 13-19, 1991. 17th International Television Symposium and Technical Exhibition. Montreux, Switzerland. Contact: P.O. Box 97, Rue du Theatre 5, CH-1820 Montreux, Switzerland.
- June 16-19, 1991. Broadcast Promotion and Marketing Executives/Broadcast Designers Association Conference & Exposition. Baltimore, MD. Contact: Gregg Balko, (213) 465-3777.
- September 25-28, 1991. Radio-Television News Directors Association Annual Convention. Denver, CO. Contact: (202) 659-6510.
- October 3-6, 1991. Society of Broadcast Engineers National Convention. Houston, TX. Contact: (317) 842-0836.
- October 26-30, 1991. Society of Motion Picture and Television Engineers Annual Conference. Los Angeles. 1992 Conference: November 10-14, Toronto. Contact: Ann Cocchia, (914) 761-1100.
- October 27-30, 1991. Association of National Advertisers 82nd Annual Meeting & Business Conference. Phoenix, AZ. Contact: Cynthia Roberts, Meeting Manager, (212) 697-5950.
- November 1991. Community Broadcasters Association Fourth Annual LPTV Conference & Exposition. The Riviera, Las Vegas, NV. Contact: Suzanne Dooling, (414) 783-5977, or Eddie Barker, (800) 225-8183.



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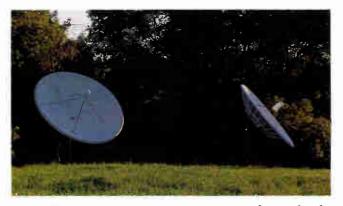
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Room 7130
Chief: William A. Daniel Room 7130
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Deputy Chief: Roderick Porter
Room 314
Room 314(202) 632-6460 Assistant Chief, Law: Robert Radcliffe Room 314(202) 632-6460
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Assistant Chief: Stuart Be	dell
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Assistant Chief, Law: Willi	am Jan Gay
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"And the company has bent over

backwards to answer our questions,

even calling back to follow up. We're

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very satisfied."

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Room 5202
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Deputy Chief: Rosalind Allen
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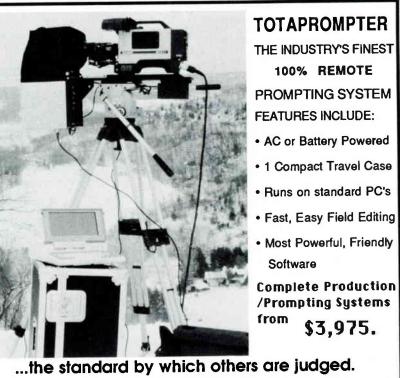
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NEW LPTV LICENSES

The following LPTV stations received licenses on the dates shown. Station call sign, location, and the name of the licensee are also given.

- K08KY Sitka, AK. Capital Community
- Broadcasting, Inc., 10/16/90.

K39CG Prescott, AZ. Yavapi College, 10/17/90. K38CW Palmdale, CA. Xenia Renatta Izzio, 10/17/90.

- W56CD Rome, GA. John O. Broomall, 9/27/90.
- W13BE Chicago, IL. Charles Woods, 10/16/90. W15AY Martinsville, IN. Randy J. Manley,
- 10/17/90.
- K46CR Baton Rouge, LA. Patricia Screen, 9/27/90.

K58DH St. Louis, MO. Kurt J. Petersen,

10/17/90.

W43AV Waukesha, WI. WCTV, Inc., 10/15/90.

NEW LPTV CONSTRUCTION PERMITS

The following parties received LPTV construction permits on the dates shown. Station call sign and location are also given.

W03BF Greensboro/Marion, AL. Dennis Adams, 10/17/90.

- K64DQ Paradise Pines, CA. California-Oregon Broadcasting, Inc., 9/19/90.
- W25BF Miami, FL. Beacon Broadcasting Corporation, 10/16/90.
- K35DD Lihue, HI. John Patrick Marcom, 9/19/90. K41DD Des Moines, IA. Susan Webb, 9/27/90. K07UO Kimberly, ID. Ellen M. Armstrong,
- 9/18/90
- W25BN Marion, IN. ACTS of Marion, Inc., 9/21/90.
- W58BT South Bend, IN. Weigel Broadcasting Company, 10/15/90.
- K68DT New Orleans, LA. Neal L. Andrews, Jr., 9/27/90.
- 10/16/90.

W22BB Taunton, MA. Greenburger/Acton Rights Associates, 10/15/90.

- K35DC St. James, MN. Watonwan TV Improvement Association, 10/15/90.
- K05JH Joplin/Carthage, MO. Don Stubblefield, 9/18/90.
- K12OM Kansas City, MO. Jeremy D. Lansman, 10/16/90.
- W26AZ Charlotte, NC. Triangle Television Company, 9/18/90.
- MS2BG Charlotte, NC. Karen K. Douglas, 9/18/90.
- K51DS Deming, NM. KOAT Television, Inc., 10/16/90.
- W67CN Rochester, NY. Television Interests Company, 9/28/90.
- W35BA Cincinnati, OH. Elliott Block, 9/28/90. W41BI Mentor, OH. Media-Com Television, Inc., 10/15/90.
- W05BZ Toledo, OH. Assai Broadcasting Company, 9/18/90.
- K16CE Morrison/Cushing, OK. Retherford Publications, Inc., 10/16/90.
- K12OK Temple, TX. Effie Marko, 10/16/90.

W60BR Chesapeake, VA. AFL Group, 9/28/90. W56CS Portsmouth, VA. Eddie L. Whitehead, 9/18/90.

BON MOT

You cannot understand how hard it is for one to be practical who hopes for tenderness behind every face.... Others can be impersonal, but not one who believes that she is on an eminently personal adventure.... Others can be sensible, but not one who knows in her heart how few things really matter. Others can be sober and restrained, but not one who is mad with the loveliness of life, and almost blind with its beauty.

Found in Dorothy Kazel's prayer book after her death in El Salvador, 1980.

INDEX TO ADVERTISERS

Use this handy chart to find the ad you're looking for. Then fill out the ACTION CARD bound in this magazine for FAST answers to all your questions.

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BEXT Inc		79	(708) 349-3300
BEXT, Inc. Comprompter Corporation	30	47	(619) 239-8462
CRA.	31	81	(608) 785-7766
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Eagle-Lion Video EMCEE Broadcast Products.	33	96	(619) 277-1211
Enribelite Diodocast Products.	29	1	(717) 443-9575
FamilyNet	10	106	(800) 832-6638
	14	180	(312) 871-5246
ITS Corporation Joel Cohen Productions. Keystone Inspirational Network	21	123	(412) 941-1500
Joel Conen Productions.	7	60	(213) 473-7444
Keystone Inspirational Network	20	48	(717) 246-1682
Kompas/Biel & Associates, Inc.	24	19	(414) 781-0188
Lindsay Specialty Products Lines Video Systems	6	12	(705) 324-2196
Lines Video Systems.	12	65	(800) 641-4674
wicrodyne Corporation	25	100	(904) 687-4633
Microwave Filter	23	172	(315) 437-3953
Panasonic	4-5	45	Please see ad
Sabatke & Company Simmons Communications	28	168	(813) 772-3994
Simmons Communications	22	87	(404) 596-0265
Sunbelt Media . TE Products, Inc. Television Technology Corporation	27	169	(303) 665-3767
TE Products, Inc.	9	17	
Television Technology Corporation	13	17	
Tootlevision	11	53	(303) 665-8000
Trident Productions, Inc.	26		(918) 836-1120
TV Turnkey Services	34	165	(800) 955-5660
Uni-Set Corporation		10	(414) 781-5044
Video Jukebox Network	15	29	(716) 544-3820
	17	145	(305) 899-9000

WorldRadioHistory

W62BW Wheeling, WV. Abacus Broadcasting, 9/28/90.

ASSIGNMENTS AND TRANSFERS

K08IW Dutch Harbor, AK. Assignment of license granted from Unalaska City School District to Unalaska Community Television, Inc. on 10/18/90.

W02BV Birmingham, AL. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

X39CQ Santa Maria, CA. Voluntary assignment of permit granted from Blacks Desiring Media, Inc. to Costa De Oro Television, Inc. on 10/9/90.

K68DQ Tahoe City, CA. Voluntary assignment of permit granted from Adam Laird Marko to Bernard Marko on 9/20/90.

K54DK Boulder, CO. Voluntary assignment of permit granted from Skywave Communications Corporation to Sunbelt Media Group, Inc. on 10/23/90. TVADD 10/1/90

W10AX Jacksonville, FL. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

W11BM Orlando, FL. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

W68CF Tampa, FL. Voluntary assignment of permit granted from Skywave Communications Corporation to WJUK-TV, Inc. on 9/21/90.

W20AU Atlanta, GA. Voluntary assignment of permit granted from Nancy Davis to Valuevision International, Inc. on 9/24/90.

K42CO Honolulu, HI. Voluntary assignment of permit granted from Charles Billings to Oceania Broadcasting Network, Inc. on 10/18/90.

K40NL Des Moines, IA. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

W67CB Evansville, IN. Voluntary assignment of permit granted from Randolph Victor Bell to South Central Communications Corporation on 10/18/90.

W47AZ Indianapolis, IN. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

W50BB Indianapolis, IN. Voluntary assignment of permit granted from Butler University to KEE Properties, Inc. on 10/18/90.

W53AV Indianapolis, IN. Voluntary assignment of permit granted from Legal Eye Videographers to KEE Properties, Inc. on 10/5/90.

W20AJ Owensboro, KY. Voluntary assignment of permit granted from Robert H. Steele on 10/18/90.

K10NG New Orleans, LA. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

W58BR Waldorf, MD. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

W69BJ Lansing/East Lansing, MI. Voluntary assignment of permit granted from Trinity Broadcasting Network to Tri-State Christian TV on 9/20/90.

K52AY St. Louis, MO. Assignment of license granted from Flor De Rio Television Company to Flor De Rio Television Company, Inc. on 10/15/90.

W08CU Jackson, MS. Transfer of control granted from Video Jukebox Network, Inc. to VJN Partners, Ltd./TCI Development Corporation on 9/28/90.

W67CD Sanford, NC. Voluntary assignment of permit granted from T. B. Buchanan to Central Carolina Broadcasting Corporation, Inc. on 9/21/90.

K48DL Omaha, NE. Voluntary assignment of permit granted from Nancy Davis to Valuevision International, Inc. on 9/24/90.

K20BR Gage, OK. Assignment of license granted from Gage Translator System to Shafer Translator, Inc. on 10/18/90. 77890 5/17/87

K22BR Gage, OK. Assignment of license granted from Gage Translator System to Shafer Translator, Inc. on 10/18/90.77460 114/87

K18BV May, OK. Assignment of license granted from Gage Translator System to Shafer Translator, Inc. on 10/18/90. **TVAP 9/14/57**

K65CD Mooreland/Woodward, OK. Assignment of license granted from OK TV Translator System of

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VIDEO

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K55EZ Seiling/Vici, OK. Assignment of license granted from OK TV Translator System of Seiling to Shafer Translator on 10/18/90. 7VADD 7/13/87

K57EA Seiling/Vici, OK. Assignment of license granted from OK TV Translator System of Seiling to Shafer Translator on 10/18/90. **TYADD 3/31/87**

K59EE Woodward, OK. Voluntary assignment of permit granted from OK TV Systems on 10/18/90.

K61CW Woodward, OK. Assignment of license granted from OK TV Translator System, Inc. to

Shafer Translator, Inc. on 10/18/90. K63CF Woodward, OK. Assignment of license

granted from OK TV Translator System, Inc. to Shafer Translator, Inc. on 10/18/90.

K67CW Woodward, OK. Assignment of license granted from OK TV Translator System, Inc. to Shafer Translator, Inc. on 10/18/90.

K69DH Woodward/Mooreland, OK. Assignment of license granted from OK TV Translator System, Inc. on 10/18/90.

W55BU Chattanooga, TN. Voluntary assignment of permit granted from TV 15, Inc. to TV 14, L.P. on 10/1/90

W66AZ Farragut, TN. Voluntary assignment of permit granted from Volunteer Realty Company, Knoxville, Inc. on 10/18/90.

K31CM Fort Worth, TX. Voluntary assignment of permit granted from American Christian TV System, Inc. to Bill Trammell on 9/21/90.

W08CK Madison, WI. Voluntary assignment of permit granted from The Identity Institute to Healthy's, Inc. on 10/2/90.

LPTV LICENSE RENEWALS

The following LPTV station received a license renewal on the date shown. Station call sign, location, and the name of the licensee are also aiven.

W47AG Rocky Mount, NC. Family Broadcasting Enterprises, 10/10/90.

PROPOSED CONSTRUCTION PERMITS

The following LPTV applications have been accepted for filing and are not mutually exclusive with any other pending applications. If no petitions to deny these applications are filed, they will be granted.

New Stations

Ch. 52 Mobile, AL. Penny C. Wilmoth.

Ch. 44 Kingman, AZ. Mohave County Board of Supervisors.

Ch. 10 Eureka, CA. Philip J. Plank.

Ch. 11 Fortuna/Ferndale, CA. North Star Communications

Ch. 5 Mineral, CA. James R. Spiethof. Ch. 39 Valdosta, GA. Impact Television Group,

Inc. Ch. 39 Waycross, GA. Women's LPTV Network. Ch. 51 Indianapolis, IN. Television Interests

Company. Ch. 51 Marion, IN. ACTS of Marion, Inc.

Ch. 58 South Bend, IN. Weigel Broadcasting Company.

Ch. 4 Maysville, KY. Philip R. Lewis.

Ch. 30 Hyannis, MA. Barbara A. Nadley.

Ch. 22 Taunton, MA. Greenburger/Acton Rights Associates

Ch. 19 Appleton, MN. Rural Western UHF TV Corporation.

Ch. 49 Austin, MN. Teleview Systems of Minnesota

Ch. 19 Redwood Falls, MN. Redwood TV Improvement.

Ch. 35 St. James, MN. Watonwan TV Improvement Association. Ch. 42 St. Louis, MO. Triangle Television Company Ch. 53 Jackson, MS. Neighborhood Television Network, Inc. Ch. 32 Greensboro, NC. Francis R. Santangelo.
Ch. 4 Washington, NC. Vearl Pennington.
Ch. 58 Conway, NH. Paugus Television, Inc.
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Broadcasting Company. Ch. 69 Datil/Horse Springs, NM, KOB-TV, Inc.

Ch. 44 Brentwood, NY. Jose Luis Rodriquez.

Ch. 51 Deer Park, NY. Xenia Renatta Izzo.

- Ch. 43 Jamestown, NY. Great Lakes
- Communications, Inc.

Ch. 29 Cleveland Heights, OH. Gwendolyn Moore.

Ch. 41 Mentor, OH. Media-Com Television, Inc. Ch. 41 Wooster, OH. Wooster Broadcasting Company.

Ch. 16 Morrison, OK. Retherford Publications, Inc.

Ch. 53 Eugene, OR. Gerald D. Kamp.

Ch. 45 Uniontown, PA. Abacus Broadcasting. Ch. 22 Guayama, PR. Ministerio Radial Cristo Viene Pront.

Ch. 65 Guayama, PR. Roberto Rodriguez.

Ch. 32 Newport, RI. Trinity Broadcasting Network.

Ch. 55 Corpus Christi, TX. Norma Torres. Ch. 38 La Grange, TX. Mountain TV Network,

Inc. Ch. 12 Temple, TX. Effie Marko.

Ch. 12 Waco, TX. Summation Broadcasting Company

Ch. 69 Fredricksburg, VA. RCC-TV, Inc. Ch. 66 Pasco, WA. Triac Communications and Partnership.

Ch. 31 Cody, WY. Generic Television. Ch. 3 Mountain View, WY. Lyman TV Association

Modifications

K44CN Cottonwood, AZ. Scripps-Howard Broadcasting Company.

K83BT Alturas, CA. Northern California Educational TV Association, Inc.

K70EL Yreka, CA, Northern California Educational TV Association, Inc.

K82BQ Yucca Valley, CA. Gulf-California Broadcasting Company, Inc.

K49CJ Colorado Springs, CO. Echonet Corporation.

- K49CE Denver, CO. Lomas De Oro Broadcasting Corporation.
- W52AZ Evansville, IN. South Central Communications Corporation.
- K26BZ Junction City, KS. Trinity Broadcasting Network.
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