

ABTO SYSTEM FOR CATV PROGRAMMING

By

Frank Marx
ABTO, Inc.
New York, N. Y.

IT IS WITH A FEELING OF HUMBLENESS THAT I SPEAK TO YOU.

WHEN FIRST I WAS HONORED BY YOUR ORGANIZATION TO TELL YOU ABOUT ABTOGRAPHY MY WORDS WERE TO BE DIRECTED TOWARD A HIGHLY TECHNICAL AND ERUDITE APPROACH. PARENTHETICALLY FROM ME, PERHAPS A HIGHLY CONFUSING APPROACH AT THAT. THEN I STARTED THINKING. MY HUMBLENESS IS BECAUSE I HAVE BEEN ALLOWED AND PRIVELEDGED THROUGH THE YEARS TO SEE AND BE A PART OF THE GROWTH OF AM RADIO, FM RADIO, T.V., BROADCASTING, SATELLITE T.V. AND NOW THAT LUSTY AND VOCAL INFANT, CABLEVISION, WHO VERY WELL MAY OUTGROW THEM ALL. DURING EACH OF THESE PERIODS AND ALMOST ANNUALLY, NEW DEVELOPMENTS, FROM WHICH CAME NEW PRODUCTS, HELPED TO NOURISH THE INFANT. TO NAME A FEW. CONDENSOR AND DYNAMIC MICROPHONES TO REPLACE THE CARBON MIKE, VIDICON PICKUP TUBES TO REPLACE THE IMAGE ORTHICONS WHICH REPLACED THE ORTHICONS WHICH REPLACED THE ICONOSCOPE WHICH REPLACED THE FLYING SPOT DISC, THE REVOLUTIONARY TRANSISTORS NOW COMMONLY CALLED THE SOLID STATE INDUSTRY, TRULY BROAD BAND CABLE CARRYING MEGAHERTZ UPON MEGAHERTZ INTO AND CAPABLE OF FROM THE HOME. THIS LIST COULD GO ON AND ON. I WAS FORTUNATE TO HAVE BEEN PRESENT DURING LABOR PAINS AND PARTICIPATE IN THE DELIVERY OF AUDIO TAPE FOR BROADCASTING DURING 1944. ALSO THE 4 HEADED MONSTER WITH THE VORACIOUS APPETITE, VIDEO TAPE IN 1956. THEN LATER THE BABY BROTHER, HELICAL SCAN, PROUDLY SHOWN BY MANY EXHIBITORS AT THIS

SHOW. WHY THE NOSTALGIA AND ISN'T IT BORING? PERHAPS SO AND I
 APOLOGIZE. NOT REALLY THOUGH. CAUSE DURING THESE SEVERAL
 LIFETIMES IV'E SEEN MANY NEW TECHNICAL GLEAMS CONCEIVED, GESTATE,
 LABOR, BE BORN ONLY TECHNICALLY SOUND BUT WHICH DIDN'T REALLY
 SERVE A NEED. WHEN I FIRST LEARNED OF THE ABTOGRAPHIC PROCESS
 IN 1965 IT JUST COULDN'T AND INDEED WOULDN'T. I COULD SENSE THE
 NEED BUT COULD ALL, AND I EMPHASIZE ALL, THE TECHNICAL PROBLEMS
 BE SOLVED? COULD WE IN FACT USE ORDINARY BLACK AND WHITE FILM
 TO STORE COLOR INFORMATION? COULD THIS ORDINARY BLACK AND WHITE
 FILM BE USED IN AN ORDINARY CAMERA, BOTH 35mm OR 2 x 2 STILL AS WELL
 AS 16mm MOVIE CAMERAS. COULD THIS BLACK AND WHITE FILM, AFTER
 EXPOSURE, BE PROCESSED AS SIMPLY AND EASILY AS ORDINARY BLACK AND
 WHITE FILM? COULD IT IN FACT BE PROCESSED IN THE CAN. COULD IT
 THEN BE VIEWED THROUGH A STANDARD 16mm PROJECTOR AS AN
 EXCELLENT BLACK AND WHITE IMAGE? COULD THIS FILM BE THEN PROJECTED
 THROUGH THE SAME PROJECTOR WITH ONLY MINOR MODIFICATIONS AND
 SHOW COLOR? COULD IT REALLY OR WAS IT ONLY A DREAM. COULD ANYONE
 HONESTLY EXPECT TO RETAIN ALL THE ADVANTAGES OF BLACK AND WHITE
 FILM AND YET BE ABLE TO VIEW IT ON A T.V. SCREEN IN FULL NATURAL
 COLOR? WELL IT COULD REALLY AND IT DOES. IT'S CALLED ABTOGRAPHY.
 IT'S BEAUTIFULLY SIMPLE IN CONCEPT, BUT EXOTICALLY COMPLEX IN
 REALITY. THE UNDERLYING PRINCIPLE IS DIFFRACTION. FRAUNHOFER
 DIFFRACTION IF YOU MUST KNOW.

SLIDE No. 1 -

THIS REPRESENTS A SIMPLE EXPLANATION OF DIFFRACTION. THINK OF THE LIGHT SOURCE AS BEING THE SUN, A POINT SOURCE OF ILLUMINATION, A VENETIAN BLIND REPRESENTING A GRATING, THEN ON THE WALL OPPOSITE THE VENETIAN BLIND WILL BE A DIFFRACTION PATTERN WHICH REALLY IS A SERIES OF IMAGES OF THE SOURCE OF ILLUMINATION. THESE REPLICAS OR ORDERS OCCUR ONLY, AND THIS IS IMPORTANT, ONLY, AT RIGHT ANGLES TO THE SLATS OF THE VENETIAN BLIND OR THE GRATING.

SLIDE No. 2 -

THIS IS AN ARTIST'S SKETCH SHOWING THE WAY AN ABTO ENCODER RECORDS COLOR INFORMATION ON BLACK AND WHITE FILM. THE ENCODER IS IN FACT THREE DIFFRACTION GRATINGS PLACED AT DIFFERENT ANGLES, EACH GRATING REPRESENTING A PRIMARY COLOR. FOR EXAMPLE, ONE SET RED, THE SECOND GREEN AND THE THIRD BLUE. THE ORIGINAL COLOR SCENE PASSES THROUGH THE COLOR TAKING LENSE, THEN THE ENCODER, ON TO THE BLACK AND WHITE FILM. HENCE, THE ORIGINAL SCENE IS PHOTOGRAPHED IN BLACK AND WHITE WITH COLOR INFORMATION RECORDED BY THREE SETS OF DIFFRACTION GRATINGS.

PROCESSING OF THE EXPOSED BLACK AND WHITE FILM IS ACCOMPLISHED WITH NORMAL BLACK AND WHITE PROCESSING METHODS WITH CARE NORMAL ONLY TO REPRODUCING A GOOD BLACK AND WHITE PICTURE.

SLIDE No. 3-

THIS REPRESENTS A STANDARD PROJECTOR, EITHER 2 X 2 SLIDE PROJECTOR OR 16mm MOVIE PROJECTOR, MODIFIED TO PLAY BACK THROUGH A TV SYSTEM IN FULL COLOR, BLACK AND WHITE FILM. NOTE THE LIGHT SOURCE TO THE LEFT OF THE SCREEN. THIS IS A STANDARD XENON ARC LAMP USED TO OBTAIN A POINT SOURCE WITH HIGH BRIGHTNESS. THIS LIGHT PASSES THROUGH THE BLACK AND WHITE FILM WHICH, REMEMBER, REALLY CONSISTS OF THREE DIFFRACTION GRATINGS AT DIFFERENT ANGLES. WHEN LIGHT IS PASSED THROUGH THIS FILM THERE WILL APPEAR WHAT IS KNOWN AS A TRANSFORM PLANE, A DIFFRACTION PATTERN WHICH IS SHOWN IN THIS SLIDE.

SLIDE No. 4-

THIS PATTERN SHOWN ON THE SCREEN CONTAINS IN THE CENTER, ALL OF THE INFORMATION IN THE ORIGINAL PICTURE. FOR CONVENIENCE WE MAY CALL THIS THE LUMINANCE CHANNEL. PLEASE NOTE THAT THERE ARE IN ADDITION TO THIS LUMINANCE CHANNEL, THREE ADDITIONAL SETS OF INFORMATION SYMMETRICAL TO THE CENTER CHANNEL. THESE SETS CONTAIN THE INFORMATION NECESSARY TO RECONVERT THE BLACK AND WHITE IMAGE INTO FULL COLOR.

NOW BACK TO SLIDE THREE. IF AT THE TRANSFORM PLANE THERE IS PLACED AN ABTO DECODER AS SHOWN IN THIS SLIDE, A FULL COLOR IMAGE OF THE ORIGINAL SCENE WILL BE RECONSTRUCTED.

SLIDE Nos. 5 and 6-

NOW MAY I SHOW YOU TWO BLACK AND WHITE SLIDES IN SUCCESSION WHICH ARE PHOTOGRAPHS OF A 2 X 2 HONEYWELL PENTAX CAMERA AND A 70VR 16mm BELL AND HOWELL MOVIE CAMERA. BOTH OF THESE ARE CAPABLE OF PHOTOGRAPHING BLACK AND WHITE AND THE RESULTANT BLACK AND WHITE FILM BEING REPRODUCED IN BEAUTIFULLY NATURAL COLOR.

IF I MADE THIS EXPLANATION TOO SIMPLE I APOLOGIZE. IF IT SOUNDS COMPLEX PLEASE REMEMBER WHAT I PREVIOUSLY SAID, "THE SYSTEM IS BEAUTIFULLY SIMPLE IN CONCEPT BUT EXOTICALLY COMPLEX IN REALITY."

I THANK YOU.