1.0 GENERAL INFORMATION

1.1 INTRODUCTION

The Acrodyne TRH/1KE Television Transmitter broadcasts C3F visual and F3E aural emissions on any single television channel between 174 and 230 MHz at a transmitter output level of 1 kilowatt peak of sync visual and one hundred watts average aural power. The units uses intermediate frequency (IF) modulation and combined visual and aural carrier amplification throughout.

The entire transmitter is contained within a single 19 inch wide cabinet.

1.2 DESCRIPTION

Refer to the block diagram included with the drawing package.

The TRH/1KE may be broken down into three major sections. They are 1) Exciter, 2) Intermediate Power Amplifier (IPA) and 3) Final Power Amplifier (PA) and associated control circuits and power supplies.

The transmitter's program video signal path begins with the Video Sync Automatic Gain Control (AGC) printed circuit board within the Video Processor Chassis. Video AGC is used to stabilize the program video signal sync region against variations in the signal supplied to the transmitter. The Video AGC output signal is then connected to the Video Corrector printed circuit board within the processor chassis. The Video Corrector is used to provide adjustment of the transmitter differential gain/differential phase characteristics and for sync pulse amplitude adjustment.

The processed video signal from the Video Processor Chassis is routed to the Exciter Chassis and the modulator circuit where it amplitude modulates the visual intermediate frequency carrier operating at 45.75 MHz CCIR M/38.9 MHz CCIR G. The modulated carrier is then passed through a SAW (Surface Acoustic Wave) filter with group delay correction to provide the proper lower sideband and group delay performance.

The transmitter's program aural signal path begins directly with the Exciter Chassis and the aural modulator circuit. Both balanced and unbalanced aural inputs are provided. These inputs frequency modulate an aural carrier, operating at 4.5 MHz CCIR M/5.5 MHz CCIR G, that is then converted to an IF carrier frequency of 45.75 MHz CCIR M/33.4 MHz CCIR G.

The three signal inputs to the IF Processor Chassis connect first to the Aural Corrector Board where signals for correction of vision to sound cross-modulation are generated. The three signals out of the Aural Corrector Board are connected to the Intermodulation (IM)/Incidental Carrier Phase Modulation (ICPM) Corrector board where they act to provide correction for inband intermodulation distortion and incidental carrier phase modulation. The separate vision and sound IF carrier outputs from this board are routed to the Visual/Aural Combiner board and mixed to create a composite IF signal. The composite IF signal is then connected to the IF Linearity Corrector circuit board, also within the IF Processor Chassis. The IF Linearity Corrector board contains a double break point diode network that is used to correct primarily for transmitter luminance (low frequency) non-linearities. The IF Linearity Corrector output is the output of the IF Processor Chassis.

The IF Processor Chassis output is connected back to the Exciter Chassis at the Transmit AGC input. The Transmit AGC functions to automatically level the transmitter output power, with the set point of the Transmit AGC being set by a potentiometer on the modulator section. The leveled IF signal out of the Transmit AGC connects to the up converter section within the Exciter Chassis.

Upconversion of the IF signal to the desired RF output frequency takes place in the double balanced mixer in this section, in conjunction with the upconversion local oscillator, also contained on the printed circuit board. The RF output of the mixer is passed through a bandpass filter for removal of unwanted mixer produces and then amplified to a nominal ten milliwatt level. The ten milliwatt amplifier output is the output of the Exciter Chassis.

The nominal ten milliwatt output of the Exciter Chassis is routed to the One Watt Amplifier Module mounted on the front of the transmitter between the output amplifiers. The One Watt Amplifier contains two RF devices operating in class A mode. The One Watt Amplifier output connects to the Intermediate Power Amplifier (IPA) Chassis.

The IPA stage is contained in a single drawer and contains two parallel sections each of two RF devices in series. The input signal to the chassis is split into two and then amplified. The two separate amplifier output signals are each applied to quadrature type splitters to create four separate output signals each of about 10 watts in power.

The four IPA output signals are each connected to separate 350 watt amplifier stages. The 350 watt amplifier stages are mounted together in pairs to form a 650 watt amplifier drawer. There are two such drawers used in this TRH/1KE transmitter. Each 350 watt amplifier section contains a single device stage driving a second stage of two devices in parallel. The

output signals from each of the 350 watt amplifiers in a 650 Watt Amplifier Drawer are combined using a quadrature type power combiner mounted separate from the drawer. The output signals from the two 2x350 watt combiners further combined using another quadrature combiner.

The resulting 1100 watt output signal is routed through a circulator for protection of the transmitter against high VSWR. The circulator output is connected through a directional coupler section for monitoring of the RF output power. The coupler output signal is routed out of the cabinet and through a high power band pass filter for removal of the out of band intermodulation products generated by the transmitter.

REVISIONS				
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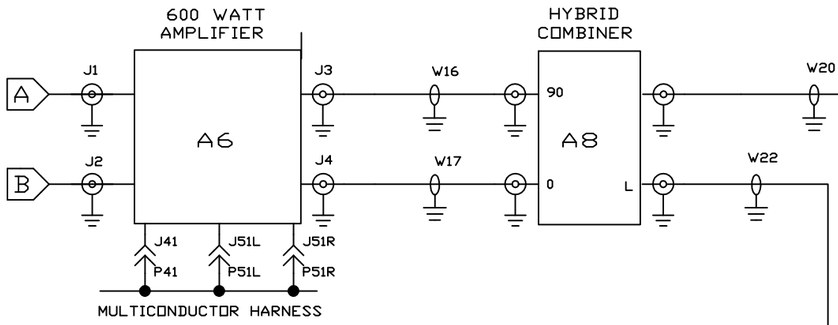
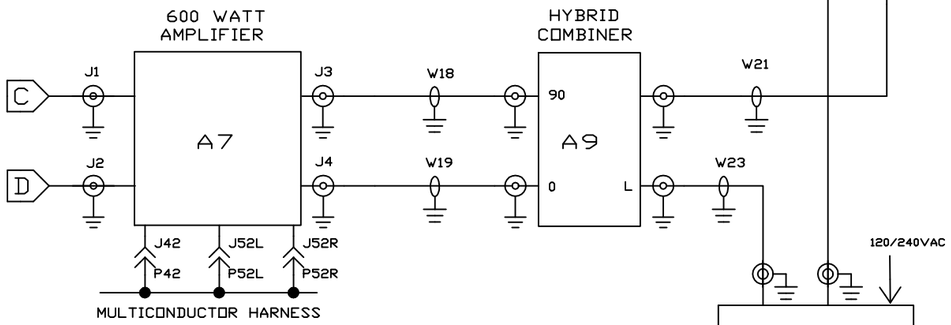
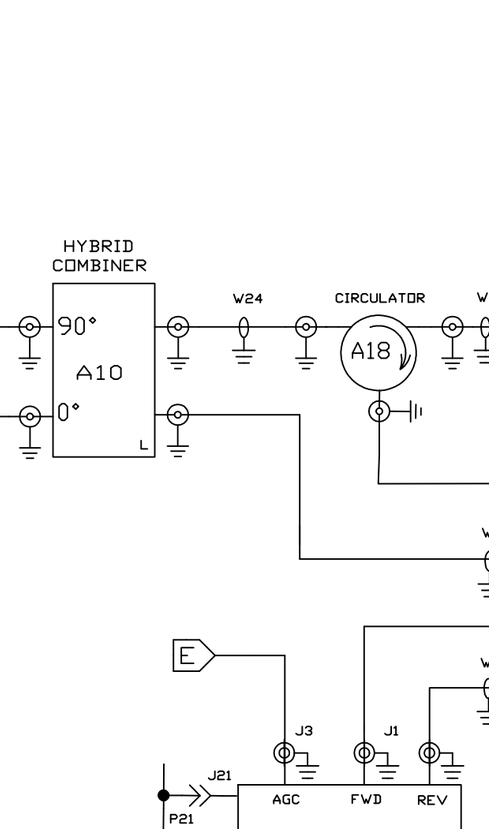


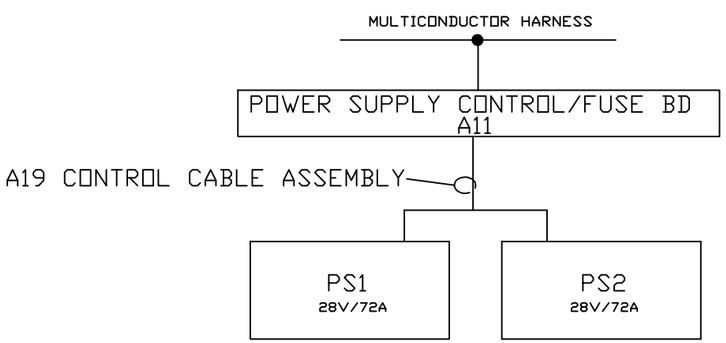




NOTES:

1) CABLES W12 THROUGH W15 (SHEET 1) TO BE IDENTICAL IN LENGTH.
   CABLES W16 THROUGH W19 (SHEET 2) TO BE IDENTICAL IN LENGTH.

2) CABLES W20, W21 TO BE IDENTICAL IN LENGHT



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PARTS LIST

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MECH ENGR		
ELECT ENGR		
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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .XX +/-.01 .XXX +/-.005
ANGLES +/- 1/2
DO NOT SCALE DRAWING

ACRODYNE
ACRODYNE INDUSTRIES INC.
516 TOWNSHIP LINE ROAD
BLUE BELL PA. 19422

TITLE
BLOCK & CABLING DIAGRAM
TRH/1KE

SIZE	CODE ID	DRAWING NO.	REV
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SCALE | SHEET 2 OF 2

REVISIONS				
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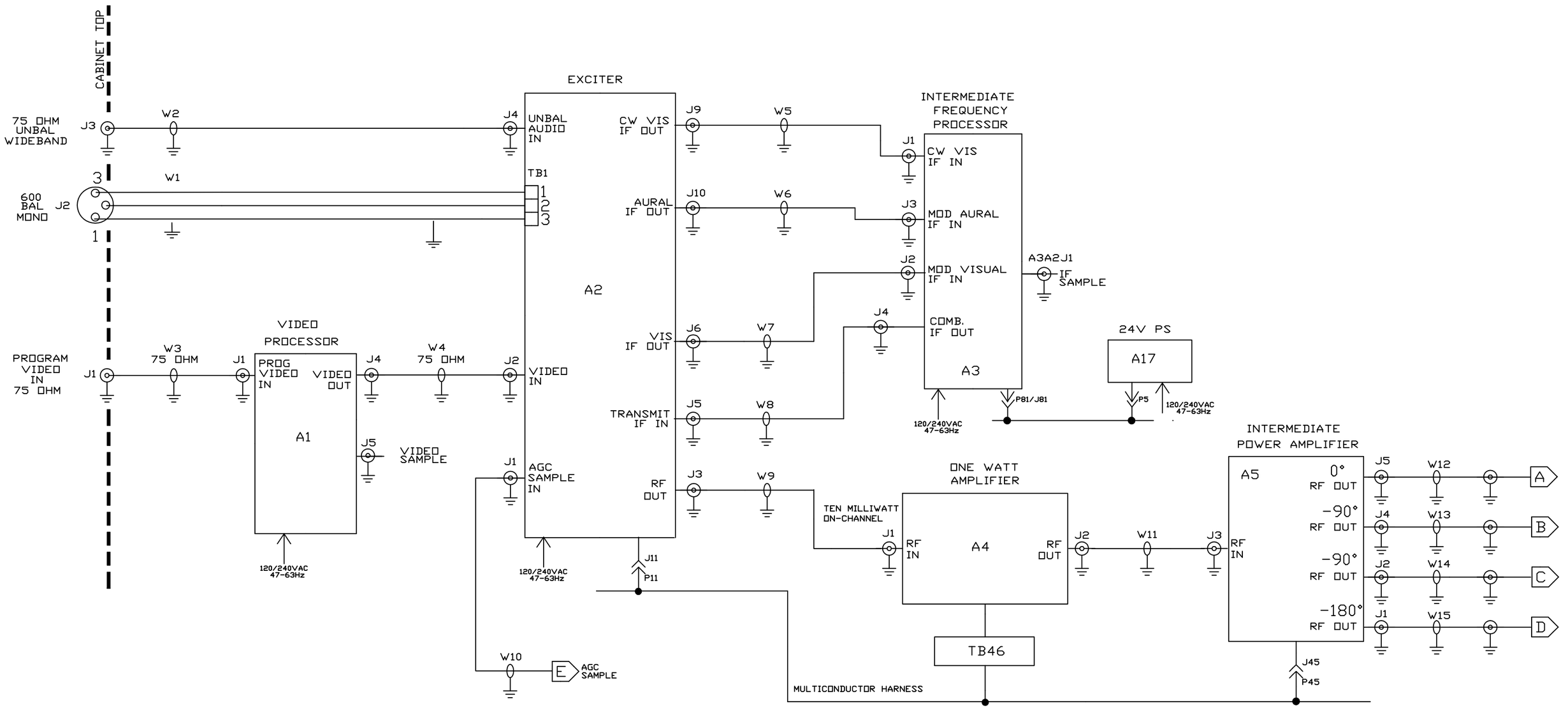

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