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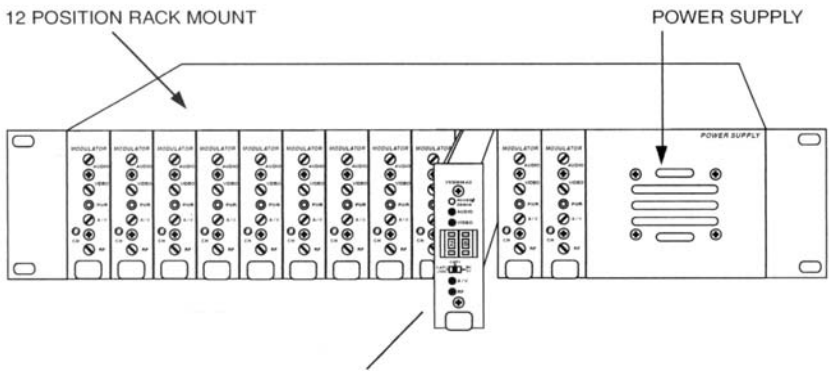
TAMM-I *AGILE VIDEO MODULATOR*
PAL-I



TAMM or TAMD Module

The Toner TAMM is a professional video modulator designed to fit most of the industries popular 2RU chassis that hold up to 12 modules such as Modulators, Demodulators, and Agile Modulators. Some of the chassis that are compatible are: Blonder Tongue MIRC, Drake RMM12, and Pico MPC-12 all available from Toner.

The TAMM-I is a high quality vestigial sideband frequency agile Audio Video modulator for PAL-I Television Systems. The unit allows front panel channel selection of standard off air broadcast and cable television channels up to 862 MHz by use of push button synthesized tuning.

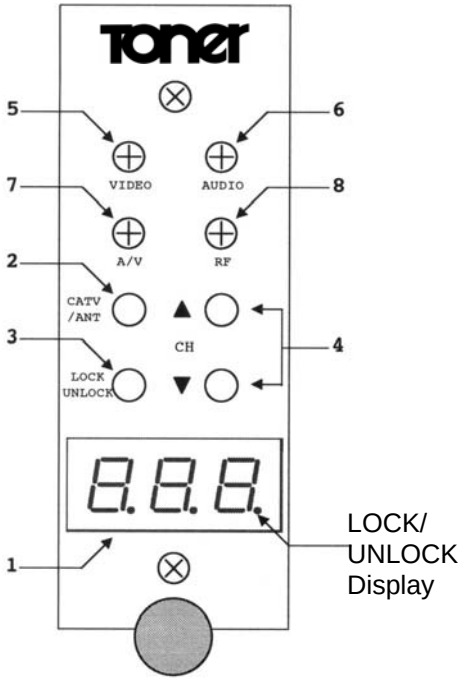
The heterodyne conversion system, in conjunction with a SAW filter, ensure optimum vestigial selectivity for adjacent channel operation.

The modulator is designed to accept any standard negative sync video at 1.0 Vp-p level. All controls are located on the front panel for ease of operation. The modulator has a 3 digit LCD channel display with a lock – unlock function to prevent unintentional channel changes. RF output level is 105 dBuV and adjustable over a 15 dB range.

The Cable Television / Off-Air Band is selected with a front panel Cable / Antenna switch, which can only be used when the unit is unlocked.

The modulator also features internal switches for audio pre-emphasis and baseband audio or aural modulated carrier.

FRONT PANEL CONTROLS and INDICATORS



1 – CHANNEL Number Display
Displays off-air broadcast channels (ANTENNA mode) with a "Dot" followed by a channel number. In cable mode, a three-digit channel number is displayed.

2 – ANTENNA / CABLE Switch
Press to toggle between ANTENNA and CABLE channel tuning. When the ANTENNA mode is selected, a "Dot" will be displayed in the far left position of the channel display. See 1. The ANTENNA/CABLE selection can be made only if the unit is unlocked. See 3.

3 – LOCK/UNLOCK Switch
Press to lock or unlock the channel selection and ANTENNA/CABLE functions. The unit is locked when a decimal point is displayed on the third digit of the display.

4 – CHANNEL ▲/▼ Select Switch
These buttons are used to increment or decrement the selected channel. The channel can only be changed when the unit is unlocked. See 3.

5 – VIDEO Adjustment
Adjustment of the video modulation level is permitted by rotating the potentiometer.

6 – AUDIO Adjustment
Adjustment of the audio modulation level is permitted by rotating the potentiometer.

7 – A/V Ration Adjustment
Adjustment of the A/V ration level Is permitted by rotating the potentiometer.

8 – RF Output Level Adjustment
Potentiometer adjustment used to set the output level.

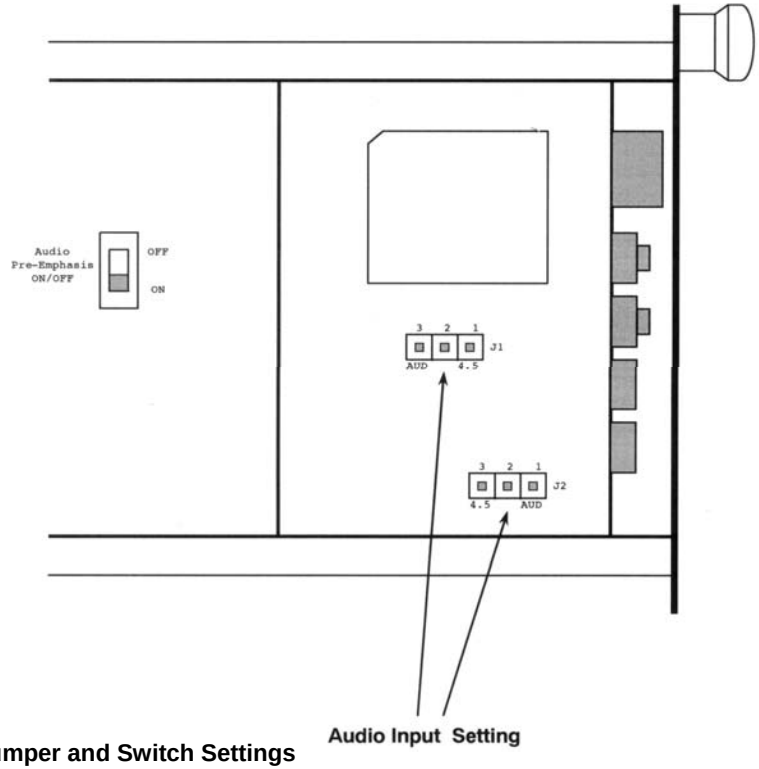
SPECIFICATIONS

RF	
Frequency Range	47-862 MHz
Cable Channels	1-100
Broadcast Channels	21-69
Output Level	105 dBuV (45 dBmV) minimum
Output Level Adjustmen	15 dB
Impedance	75 Ω
A/V Ratio	11-18 dB
Frequency Stability	±5 KHz typ, ±10 KHz max
Spurious Outputs @ 105 dBuV (A.V Carrier – 15 dB)	-65 dB typ, -60 dB min
In Channel C/N @ 5 MHz BW	62 dB typ, 60 dB min
Return Loss	12 dB typ, 9 dB min
VIDEO	
Input Level for 87.5% Modulation	1 Vp-p
Input Impedance	75 Ω
Frequency Response	30 Hz to 5.5 MHz ±1.2 dB
Differential Gain	5%
Differential Phase	5°
AUDIO	
Input Level @ 50 KHz Deviation	0.5 Vp-p
Input Impedance	>10K Ohms, unbalanced
Subcarrier Frequency	6.0 MHz ±1 KHz
Audio Response 40 Hz to 15 KHz (50μs pre-emphasis)	±1.5 dB
External Subcarrier Input Level	97 dBuV (37 dBmV)
GENERAL	
Operating Temperature	0 to 50°C
DC Power 12V	240 mA
5V	230 mA
Weight	368G (13 oz)
Size	26W x 88H x 195L (1.0 x 3.5 x 7.6 inches)

PAL-I OFF AIR CHANNEL FREQUENCY TABLE

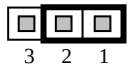
CH	Fp (MHz)	CH	Fp (MHz)	CH	Fp (MHz)	CH	Fp (MHz)
21	471.25	46	671.25				
22	479.25	47	679.25				
23	487.25	48	687.25				
24	495.25	49	695.25				
25	503.25	50	703.25				
26	511.25	51	711.25				
27	519.25	52	719.25				
28	527.25	53	727.25				
29	535.25	54	735.25				
30	543.25	55	743.25				
31	551.25	56	751.25				
32	559.25	57	759.25				
33	567.25	58	767.25				
34	575.25	59	775.25				
35	583.25	60	783.25				
36	591.25	61	791.25				
37	599.25	62	799.25				
38	607.25	63	807.25				
39	615.25	64	815.25				
40	623.25	65	823.25				
41	631.25	66	831.25				
42	639.25	67	839.25				
43	647.25	68	847.25				
44	655.25	69	855.25				
45	663.25						

REAR PANEL INTERNAL JUMPERS / SWITCH SETTINGS

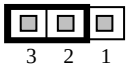


Internal Jumper and Switch Settings

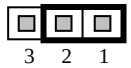
Jumper 1 (J1) – External Subcarrier Select Setting

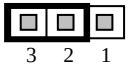
1-2 position = Defeats Aural Carrier . . . . . 

(Must also set Jumper 2 to 2-3)

2-3 position = Standard Internal Aural Offset . . . . . 

Jumper 2 (J2) – Audio Input Setting

1-2 position = Baseband Audio . . . . . 

2-3 position = Aural Modulated Carrier . . . . . 

(Must also set Jumper 1 to 1-2)

Audio Pre-Emphasis Setting

Audio Pre-Emphasis ON . . . . . 

Audio Pre-Emphasis OFF . . . . . 

INSTALLATION

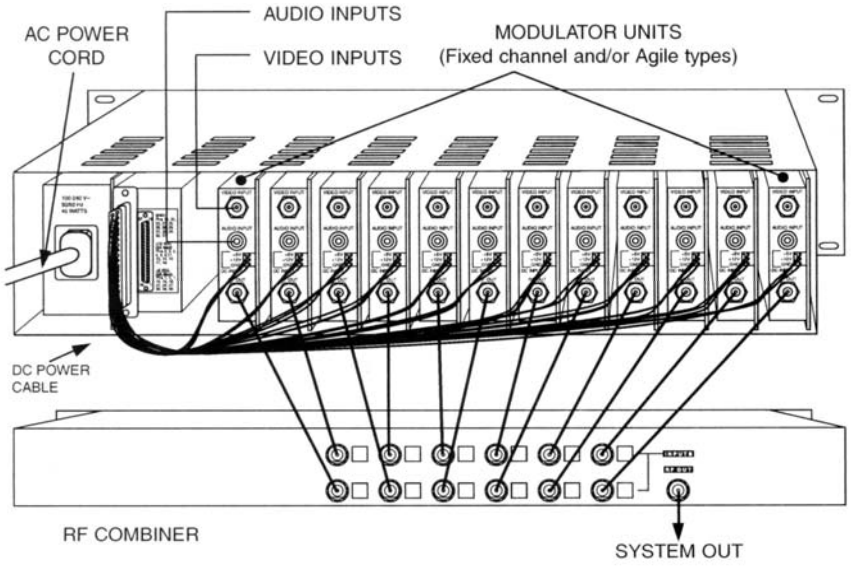


Figure 4

CONNECTIONS AND CONTROLS
All connections to and from each modulator are made through the rear panel. Figure 4 illustrates an installation with (12) modulator units combined through a passive signal combiner. Additional channels can be added by using additional fixed channel or agile type modulators and either mult-port combiners or combinations of two-port combiners.

INSTALLATION NOTES
Level adjustment provides optimum performance in mult-channel installations. The modulator outputs should be checked periodically with a spectrum analyzer to maintain a ±1 dB variation of adjacent channel carriers. Aural/Visual (A/V) ratios should be held to -15 dB or less. The output 'RF' and 'AV' (Ratio)' controls are used respectively to make these adjustments.

RACK MOUNTING
Adequate ventilation is very important in multi-channel installations. Units should be spaced apart by at least one panel height wherever possible, and some air movement is mandatory in enclosed rack cabinets. Excessive heat will shorten component life and modulator performance will be degraded without proper cooling.

PAL-I CATV CHANNEL FREQUENCY TABLE

CH	Fp (MHz)	CH	Fp (MHz)	CH	Fp (MHz)	CH	Fp (MHz)
01	56.00	26	256.00	51	456.00	76	656.00
02	64.00	27	264.00	52	464.00	77	664.00
03	72.00	28	272.00	53	472.00	78	672.00
04	80.00	29	280.00	54	480.00	79	680.00
05	88.00	30	288.00	55	488.00	80	688.00
06	96.00	31	296.00	56	496.00	81	696.00
07	104.00	32	304.00	57	504.00	82	704.00
08	112.00	33	312.00	58	512.00	83	712.00
09	120.00	34	320.00	59	520.00	84	720.00
10	128.00	35	328.00	60	528.00	85	728.00
11	136.00	36	336.00	61	536.00	86	736.00
12	144.00	37	344.0	62	544.00	87	744.00
13	152.00	38	352.00	63	552.00	88	752.00
14	160.00	39	360.00	64	560.00	89	760.00
15	168.00	40	368.00	65	568.00	90	768.00
16	176.00	41	376.00	66	576.00	91	776.00
17	184.00	42	384.00	67	584.00	92	784.00
18	192.00	43	392.00	68	592.00	93	792.00
19	200.00	44	400.00	69	600.00	94	800.00
20	208.00	45	408.00	70	608.00	95	808.00
21	216.00	46	416.00	71	616.00	96	816.00
22	224.00	47	424.00	72	624.00	97	824.00
23	232.00	48	432.00	73	632.00	98	832.00
24	240.00	49	440.00	74	640.00	99	840.00
25	248.00	50	448.00	75	648.00	100	848.00