



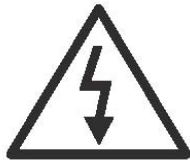
## INSTALLATION MANUAL

### CT-FSAM550 Agile Audio/Video Modulator

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#### ***IMPORTANT INFORMATION***

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The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**WARNING :** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DO NOT OPEN THE CABINET, REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

## PACKAGE CONTENTS

This package contains:

- One CT-FSAM550 Agile Audio/Video Modulator
- One CT-FSAM550 Installation Manual

## PRODUCT DESCRIPTION

The **CT-FSAM550** is a professional grade, SAW filtered, all solid-state frequency agile audio/video modulator providing 57 dBmV output over 82 channels from CATV channel 2 to 78 and 95 to 99 from 54 to 550 MHz. This modulator features composite audio-video IF loop for compatibility with encoders and video-override applications. Front panel DIP-switch controlled PLL allows easy channel selection and drift-free channel stability.

# SPECIFICATIONS

## CT-FSAM550

Audio/Video Modulator Specifications (Typical)

<b>RF</b>	
1. Video Channels	82 channels (2-78, 95-99)
2. Frequency Range	54 to 550 MHz
3. Output Level	45 to 57 dBmV, $\pm 2$ dBmV
4. Output Impedance	75 Ohms
5. Output Return Loss	-15 dB
6. Output Level Range	15 dB (Continuously Adjustable)
7. A/V Carrier Ratio Control	Adjustable -7 to -22 dB below visual carrier
8. Spurious Output	-60 dB below video carrier with A/V ratio @ -15dB
9. Frequency Accuracy/Stability	$\pm 5$ kHz in aeronautical band
10. C/N In-Band	>57 dB
11. C/N Out-of-Band	>68 dB
12. Fv+6 MHz (Upper Adj. Reject)	> 60 dBc
13. Fv-1.5 MHz (Lower Adj. Reject)	60 dBc
<b>VIDEO</b>	
1. Video Input Level	1 Vp-p @87.5% Modulation
2. Input Type	Clamped video neg. synch
3. Video S/N	-60 dB minimum (weighted)
4. Input Level Range	0.5 V to 1.5 V p-p
5. Frequency Response	$\pm 0.8$ dB 30 Hz to 4.2 MHz
6. Differential Gain	<5% (10 to 90% APL)
7. Differential Phase	<5° (10 to 90% APL)
8. Chrominance luminance delay	Meets FCC group delay predistortion requirements for color transmission
9. Hum and Noise	-60 dB @ 87.5 modulation
<b>AUDIO</b>	
1. Baseband Input Level	0.5 Vp-p for 25 kHz Peak Deviation
2. Baseband Input Impedance	600 Ohms Unbalanced
3. Pre-emphasis	75 microseconds
4. Flatness	1.5 dB max. 50 Hz to 15 kHz
<b>GENERAL</b>	
1. Power Input Range	95 V ~ 130 VAC, 60 Hz
2. Operating Temperature	32 °F ~ 122 °F
3. Connectors	All "F" Type
<b>MECHANICAL</b>	
1. Dimensions	19" (W) x 1-3/4" (H) x 9 3/8" (D)
2. Weight	3.8 lbs.

# INSTALLATION AND OPERATION

## NOTE TO SYSTEM INSTALLER

System installer must adhere to Article 820-40 of the NEC that provides guidelines for proper grounding and specifies that the cable ground shall be connected to *the grounding system of the building*, as close to the point of cable entry as practical.

### 1. UNPACKING and HANDLING

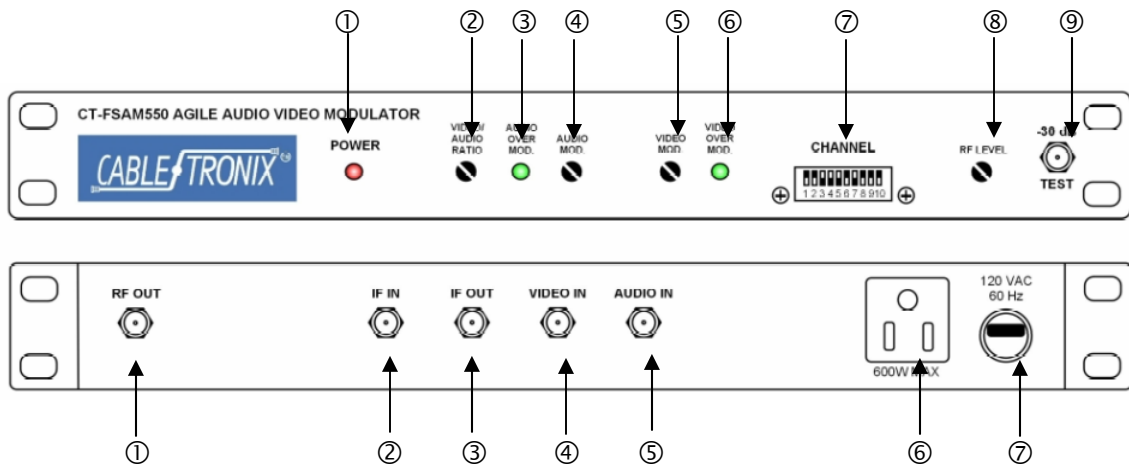
Each unit is shipped with all equipment assembled, and factory tested.

Ensure that all accessories are removed from the container before discarding packing material

### 2. MECHANICAL INSPECTION

Inspect the front and rear of the equipment for shipping damage. Make sure the equipment is clean, and no connectors are broken, damaged, or loose. If equipment appears to be damaged or defective please contact us at 1-610-429-1511 for assistance.

### 3. PRODUCT DIAGRAM



### FRONT PANEL

1	<b>Power</b>	Power-On indicator light.
2	<b>Video/Audio Ratio Adjustment</b>	Used to set level of audio carrier below video carrier.
3	<b>Audio Modulation LED</b>	Indicates aural over modulation level when lit.
4	<b>Audio Modulation Adjustment</b>	Adjusts for 25 kHz peak deviation.
5	<b>Video Modulation Adjustment</b>	Adjusts depth of modulation when video level is greater than 1.5Vp-p terminated signal.
6	<b>Video Modulation LED</b>	Indicates video over modulation when lit.
7	<b>Channel Select</b>	DIP switches are used to select desired channel.
8	<b>RF Output Adjust</b>	Used to set output level.
9	<b>Output Test Port</b>	The input signal is tapped down –30dB for monitoring. Test port must be terminated when not in use.

### BACK PANEL

1	<b>RF Output</b>	The modulated output signal is available for distribution from the F-connector port.
2	<b>I.F. Input</b>	Input from I.F. scrambler or I.F. output.
3	<b>I.F. Output</b>	To I.F. input or to scrambling device.
4	<b>Video Input</b>	F-connector accepts video signal from a video source such as a satellite receiver, demodulator, or DVD player.
5	<b>Audio Input</b>	F-connector accepts audio signal from a video source such as a satellite receiver, demodulator, or DVD player.
6	<b>Convenience Outlet</b>	Allows looping of power among units. 117 VAC type.
7	<b>Power Cord</b>	For 120VAC, 60Hz

## 4. HARDWARE CONNECTIONS

- a. The CT-FSAM550 is designed for installation in a standard 19" EIA rack.
- b. Connect a jumper cable between the **I.F. Output port** and the **I.F. Input port** if no scrambling or EAS system is being used.
- c. Connect a 75ohm coaxial cable with F-connectors from the **video source's Audio Output port to the CT-FSAM550's Audio Input port.**
- d. Connect a 75ohm coaxial cable with F-connectors from the **video source's Video Output port to the CT-FSAM550's Video Input port.**
- e. Connect a 75ohm coaxial cable with F-connectors from the **CT-FSAM550's RF Output port to the headend combiner.**
- f. Connect the CT-FSAM550 to an appropriate power source capable of powering this device. Be certain that power source is capable of handling the load if the CT-FSAM550 and other equipment are being powered by it. The use of a surge protector is highly recommended. Product warranty does not cover surge damages.

## 5. CHANNEL SELECTION

Select the desired output channel by setting the DIP switches according to the chart below.

## 6. ADJUSTMENT

- a. After installation and completing all hardware connections power the unit and wait 20 minutes before making the following adjustments.
- b. For testing purposes **no more than 15dB** from the **RF Output** should be going to a TV or RF input monitor. Use an attenuator to reduce the signal level if testing with an RF Input monitor. Individual CT-FSAM550 setup and level settings can be tested from the **RF Output** port. However, system level testing should be done from the combiner.
- c. With a nominal 1 Vp-p video source connected, adjust the **VIDEO MODULATION ADJUSTMENT** control. The video AGC circuit will automatically set the unit for 87.5% modulation over an input level of 0.5 to 1.5 volts peak-to-peak. If the video input is greater than 1.5Vp-p, adjust the **VIDEO MODULATION LEVEL** for correct percentage of modulation (87.5%). If test equipment is not available then adjust for proper picture contrast when viewed on a TV monitor and compare with known Off-Air broadcast picture quality.
- d. With audio source connected, adjust **AUDIO MODULATION ADJUSTMENT** control on the front panel for 25 KHz deviation using a precision demodulator and audio meter. Instead of an audio modulation meter, use a TV set and adjust for equal volume as compared to a known Off-Air broadcast. Monitor for a few minutes to assure the maximum volume does not over modulate, which can cause picture distortion.
- e. The aural carrier level should be adjusted to 15 dB below the level of the video carrier by slowly rotation the **VIDEO AUDIO RATIO ADJUSTMENT**.
- f. During field maintenance of the headend the CT-FSAM550's **Output Test** port can be used for taking unit measurements. However, note the output from the port is padded down -30 dB and must be taken into consideration when adjusting levels.

## 7. TROUBLESHOOTING

- a. Ensure you are using quality multiple shielded cables with quality radial or compression F-connectors.
- b. Ensure the F-connector's center conductor is making solid contact with the CT-FSAM550's **Video Input, Audio Input, and RF Output** ports.
- c. If the CT-FSAM550 is receiving power but no signal, check to be sure the video and/or audio input cables are securely connected with their respective Video Output and Audio Output ports on the video source and the Video Input and Audio Input ports on the CT-FSAM550. Also ensure the cable is securely connected at the CT-FSAM550's **RF Output** port and the combiner's input ports.

- d. When taking measurements it is always best to use a quality signal level meter. For initial individual CT-FSAM550 setup measurements may be taken from the unit's RF Output port. System level measurements, however, should be taken from the combiner's output. For field maintenance, the CT-FSAM550's Output Test port may be used. However, note that port is padded down -30dB that must be taken into consideration when determining individual unit level settings and output.
- e. Further troubleshooting assistance can be found on-line at [www.northamericacable.com](http://www.northamericacable.com) and [www.cabletronix.com](http://www.cabletronix.com) in addition to support from Cabletronix sales engineers at 1-610-429-1511.

## 8. DIP SWITCH SETTING for CHANNEL SELECTION

Channel Std.	EIA	Video Freq MHz	Offset CH Video Freq MHz	OSC Freq. MHz	DIP Switches									
					1	2	3	4	5	6	7	8	9	10
2	2	55.25		1014	0	1	0	0	0	0	0	0	0	0
3	3	61.25		1020	1	1	0	0	0	0	0	0	0	0
4	4	67.25		1026	0	0	1	0	0	0	0	0	0	0
5	5	77.725		1036	1	0	1	0	0	0	0	0	0	0
6	6	83.25		1042	0	1	1	0	0	0	0	0	0	0
A-5	95	91.25		1050	1	1	1	1	1	0	1	0	0	0
A-4	96	97.25		1056	0	0	0	0	0	1	1	0	0	0
A-3	97	103.25		1062	1	0	0	0	0	1	1	0	0	0
A-2	98	*	109.2750	1068	0	1	0	0	0	1	1	0	1	0
A-1	99	*	115.2750	1074	1	1	0	0	0	1	1	0	1	0
A	14	*	121.2625	1080	0	1	1	1	0	0	0	0	0	1
B	15	*	127.2625	1086	1	1	1	1	0	0	0	0	0	1
C	16	*	133.2625	1092	0	0	0	0	1	0	0	0	0	1
D	17	139.25		1098	1	0	0	0	1	0	0	0	0	0
E	18	145.25		1104	0	1	0	0	1	0	0	0	0	0
F	19	151.25		1110	1	1	0	0	1	0	0	0	0	0
G	20	157.25		1116	0	0	1	0	1	0	0	0	0	0
H	21	163.25		1122	1	0	1	0	1	0	0	0	0	0
I	22	169.25		1128	0	1	1	0	1	0	0	0	0	0
7	7	175.25		1134	1	1	1	0	0	0	0	0	0	0
8	8	181.25		1140	0	0	0	1	0	0	0	0	0	0
9	9	187.25		1146	1	0	0	1	0	0	0	0	0	0
10	10	193.25		1152	0	1	0	1	0	0	0	0	0	0
11	11	199.25		1158	1	1	0	1	0	0	0	0	0	0
12	12	205.25		1164	0	0	1	1	0	0	0	0	0	0
13	13	211.25		1170	1	0	1	1	0	0	0	0	0	0
J	23	217.25		1176	1	1	1	0	1	0	0	0	0	0
K	24	223.25		1182	0	0	0	1	1	0	0	0	0	0
L	25	*	229.2625	1188	1	0	0	1	1	0	0	0	0	1
M	26	*	235.2625	1194	0	1	0	1	1	0	0	0	0	1
N	27	*	241.2625	1200	1	1	0	1	1	0	0	0	0	1
O	28	*	247.2625	1206	0	0	1	1	1	0	0	0	0	1
P	29	*	253.2625	1212	1	0	1	1	1	0	0	0	0	1
Q	30	*	259.2625	1218	0	1	1	1	1	0	0	0	0	1
R	31	*	265.2625	1224	1	1	1	1	1	0	0	0	0	1
S	32	*	271.2625	1230	0	0	0	0	0	1	0	0	0	1
T	33	*	277/2625	1236	1	0	0	0	0	1	0	0	0	1
U	34	*	283.2625	1242	0	1	0	0	0	1	0	0	0	1
V	35	*	289.2625	1248	1	1	0	0	0	1	0	0	0	1
W	36	*	295.2625	1254	0	0	1	0	0	1	0	0	0	1
AA	37	*	301.2625	1260	1	0	1	0	0	1	0	0	0	1
BB	38	*	307.2625	1266	0	1	1	0	0	1	0	0	0	1
CC	39	*	313.2625	1272	1	1	1	0	0	1	0	0	0	1
DD	40	*	319.2625	1278	0	0	0	1	0	1	0	0	0	1

EE	41	*	325.2625	1284	1 0 0 1 0 1 0 0 0 1
FF	42	*	331.2625	1290	0 1 0 1 0 1 0 0 1 0
GG	43	*	337.2625	1296	1 1 0 1 0 1 0 0 0 1
HH	44	*	343.2625	1302	0 0 1 1 0 1 0 0 0 1
II	45	*	349.2625	1308	1 0 1 1 0 1 0 0 0 1
JJ	46	*	355.2625	1314	0 1 1 1 0 1 0 0 0 1
KK	47	*	361.2625	1320	1 1 1 1 0 1 0 0 0 1
LL	48	*	367.2625	1326	0 0 0 0 1 1 0 0 0 1
MM	49	*	373.2625	1332	1 0 0 0 1 1 0 0 0 1
NN	50	*	379.2625	1338	0 1 0 0 1 1 0 0 0 1
OO	51	*	385.2625	1344	1 1 0 0 1 1 0 0 0 1
PP	52	*	391.2625	1350	0 0 1 0 1 1 0 0 0 1
QQ	53	*	397.2625	1356	1 0 1 0 1 1 0 0 0 1
RR	54	403.25		1362	0 1 1 0 1 1 0 0 0 0
SS	55	409.25		1368	1 1 1 0 1 1 0 0 0 0
TT	56	415.25		1374	0 0 0 1 1 1 0 0 0 0
UU	57	421.25		1380	1 0 0 1 1 1 0 0 0 0
VV	58	427.25		1386	0 1 0 1 1 1 0 0 0 0
WW	59	433.25		1392	1 1 0 1 1 1 0 0 0 0
XX	60	439.25		1398	0 0 1 1 1 1 0 0 0 0
YY	61	445.25		1404	1 0 1 1 1 1 0 0 0 0
ZZ	62	451.25		1410	0 1 1 1 1 1 0 0 0 0
AAA	63	457.25		1416	1 1 1 1 1 1 0 0 0 0
BBB	64	463.25		1422	0 0 0 0 0 0 1 0 0 0
CCC	65	469.25		1428	1 0 0 0 0 0 1 0 0 0
DDD	66	475.25		1434	0 1 0 0 0 0 1 0 0 0
EEE	67	481.25		1440	1 1 0 0 0 0 1 0 0 0
FFF	68	487.25		1446	0 0 1 0 0 0 1 0 0 0
GGG	69	493.25		1452	1 0 1 0 0 0 1 0 0 0
HHH	70	499.25		1458	0 1 1 0 0 0 1 0 0 0
III	71	505.25		1464	1 1 1 0 0 0 1 0 0 0
JJJ	72	511.25		1470	0 0 0 1 0 0 1 0 0 0
KKK	73	517.25		1476	1 0 0 1 0 0 1 0 0 0
LLL	74	523.25		1482	0 1 0 1 0 0 1 0 0 0
MMM	75	529.25		1488	1 1 0 1 0 0 1 0 0 0
NNN	76	535.25		1494	0 0 1 1 0 0 1 0 0 0
OOO	77	541.25		1500	1 0 1 1 0 0 1 0 0 0
PPP	78	547.25		1506	0 1 1 1 0 0 1 0 0 0

\* These channels shall be offset in accordance with FCC Ruling Section 76.612

Frequency	Channel	Number	Offset
108 to 118 MHz	A, B, C	14, 15, 16	12.5 kHz
118 to 137 MHz	A-1, A-1	98, 99	25 kHz
225 to 328.6 MHz	K – DD	24 -40	12. kHz
328.6 to 225.4 MHz	FF	42	25 kHz
335.4 to 400 MHz	GG-QQ	43-53	12.5 kHz

This is a notice to inform you that content passing thru this device may contain strong language or depictions of violence, sex or substance abuse. This unit contains no parental control features. Parental discretion is advised.