



LCM-550x12 SERIES

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LCM-550x12 Series

Section I: Modulators

1. LCM-550x1
2. LCM-550x1 PAL I
3. LCM-550x1 PAL BG

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4. LCD-550x1 PAL D/K

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1. LCX12-AMP

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LCM-550x12

12 CHANNEL TELEVISION MODULATOR SYSTEM

INSTRUCTION MANUAL

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LCM-550x12

Frequency Agile Modulator System

Specifications

Output Frequency Range:	55.25 to 547.25MHz in 2MHz increments, selected by front panel DIP switch. 250KHz increments internally selectable for HRC frequencies.
Output Power:	+40dBmV minimum, +45dBmV typical per channel. Downward adjustable by 10dB minimum.
Spurious Outputs:	>60dB below output video carrier out of band.
Out-of-Band C/N:	>80dB below output video carrier (4MHz bandwidth) - per channel.
In-Band C/N:	>57dB
Frequency Stability/Accuracy:	Designed to meet F.C.C. title 47 part 76 (+10 Celsius to + 40 Celsius). Offset adjustable by front panel potentiometer.
Audio/Video Ratio Adjust:	From 13dB to 20dB below video carrier. Adjustable by front panel potentiometer.
Audio Intercarrier Accuracy:	4.5MHz +/- 1KHz
Video Input:	1V P-P nominal for 85% modulation. Front panel adjustable, from as low as 0.5V P-P input. 75 Ohm input Z utilizing an RCA connector.
Audio Input:	500mV P-P for 25KHz deviation. Adjustable by front panel potentiometer. 10K input Z utilizing an RCA connector.
Power Requirements:	85 - 264VAC, 47 - 63Hz, 60 Watts maximum.
Size:	3.5"H x 19"W x 11"D (Rack Mount Chassis)
Weight:	10 LBS.

LCM-550x12

12 CHANNEL, FREQUENCY AGILE - F.C.C. COMPATIBLE TELEVISION MODULATOR SYSTEM

1.) INTRODUCTION

The Olson Technology LCM-550X12 can consist of twelve frequency agile F.C.C. compatible television modulators in a single 3 ½" rack – mount chassis. The LCM-550X12 has a separate RF output for each channel, and each channel may be operated at +45dBmV typical, +40dBmV guaranteed minimum. The LCM-550X12 modulator is compatible with baseband scrambling techniques. No I.F. loops are provided on these modulators.

Each of the twelve modulators will operate on any standard or cable channel from 55.25MHz to 547.25MHz (VHF channels 2 through 13 and cable channels 14 through 78). All channels are selectable by front panel DIP switches and a front panel adjustment allows setting to F.C.C. offset frequencies. HRC frequencies are available.

Each of the modulators in the LCM-550X12 offers the unique Olson Technology feature of >80dB out-of-band carrier to noise ratio. These units use SAW filtering for adjacent channel operation, and provide 60dB of spurious free dynamic range. These features allow virtually unlimited numbers of LCM-550X12's to be combined without the need for external bandpass filters.

The LCM-550X12 has low power consumption (approximately 5 watts per channel @ 115 VAC) for economical and reliable long term operation.

2.) CHANNEL SELECTION

Channel frequencies are selected by setting the 10-position DIP switch (visible through the vertical slot in the front panel). The front panel is illustrated in figure 1.

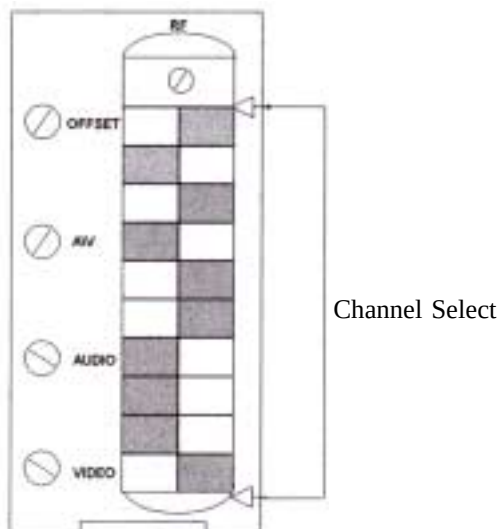


Figure 1 – LCM-550 Front Panel

Switch-setting codes for standard channels are shown in Figure 2 and on the code card provided with the system. Switch-setting codes for HRC channel frequencies can be found in Table 2 and Figure 3 in this manual. The front panel illustration in Figure 1 shows a switch properly set for standard channel 2.

3.) F.C.C. OFFSET ADJUSTMENT

F.C.C. Offset frequencies are shown in Table 1 and summarized on the code card provided with the system. To adjust the frequency of a selected channel to provide the correct F.C.C. offset, look up its offset frequency in Table 1 (or use the summary on the code card). Remove the video input and connect a counter to the RF output of the LCM-550. Use the front panel offset adjust control to set the output frequency to the correct value.

0=Switch in RIGHT Position
1=Switch in LEFT Position

	RF	
O OFFSET	O	POSITION
	0	1
O A/V	1	2
	0	3
O AUDIO	1	4
	0	5
O VIDIO	0	6
	1	7
	1	8
	1	9
	0	10

- 1) ABOVE DIP SWITCH SETTING DENOTES CHANNEL 2
- 2) TO SELECT DESIRED CHANNEL, SET THE CHANNEL SELECT SWITCHES PER ATTACHED CODE CARDS
- 3) TO SELECT F.C.C. OFFSET VALUE FOR A DESIRED CHANNEL, DISCONNECT THE VIDIO INPUT SIGNAL AND CONNECT A COUNTER TO THE R.F. OUTPUT. THEN ADJUST THE F.C.C. OFFSET CONTROL POT UNTIL COUNTER READS CHANNEL FREQUENCY PLUS OFFSET.
- 4) REFER TO MANUAL FOR HRC SETTINGS

OFFSET VALUE INFORMATION

- 1) Channels A, B, C, L to W, AA to EE & GG to QQ=12.5kHz.
- 2) Channels A-2, A-1 & FF = 25kHz
- 3) All others = 0kHz

95-000540

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CH	FREQ	SWITCH	SETTING
2	55.25	01010	01110
3	61.25	01010	10001
4	67.25	01010	10100
5	77.25	01010	11001
6	83.25	01010	11100
95	91.25	01011	00000
96	97.25	01011	00011
97	103.25	01011	00110
98	109.25	01011	01001
99	115.25	01011	01100
7	175.25	01100	01010
8	181.25	01100	01101
9	187.25	01100	10000
10	193.25	01100	10011
11	199.25	01100	10110
12	205.25	01100	11001
13	211.25	01100	11100
14	121.25	01011	01111
15	127.25	01011	10010
16	133.25	01011	10101
17	139.25	01011	11000
18	145.25	01011	11011
19	151.25	01011	11110
20	157.25	01100	00001
21	163.25	01100	00100
22	169.25	01100	00111
23	217.25	01100	11111
24	223.25	01101	00010
25	229.25	01101	00101
26	235.25	01101	01000
27	241.25	01101	01011
28	247.25	01101	01110
29	253.25	01101	10001
30	259.25	01101	10100
31	265.25	01101	10111
32	271.25	01101	11010
33	277.25	01101	11101
34	283.25	01110	00000
35	289.25	01110	00011
36	295.25	01110	00110
37	301.25	01110	01001
38	307.25	01110	01100

CH	FREQ	SWITCH	SETTING
39	313.25	01110	01111
40	319.25	01110	10010
41	325.25	01110	10101
42	331.25	01110	11000
43	337.25	01110	11011
44	343.25	01110	11110
45	349.25	01111	00001
46	355.25	01111	00100
47	361.25	01111	00111
48	367.25	01111	01010
49	373.25	01111	01101
50	379.25	01111	10000
51	385.25	01111	10011
52	391.25	01111	10110
53	397.25	01111	11001
54	403.25	01111	11100
55	409.25	01111	11111
56	415.25	10000	00010
57	421.25	10000	00101
58	427.25	10000	01000
59	433.25	10000	01011
60	439.25	10000	01110
61	445.25	10000	10001
62	451.25	10000	10100
63	457.25	10000	10111
64	463.25	10000	11010
65	469.25	10000	11101
66	475.25	10001	00000
67	481.25	10001	00011
68	487.25	10001	00110
69	493.25	10001	01001
70	499.25	10001	01100
71	505.25	10001	01111
72	511.25	10001	10010
73	517.25	10001	10101
74	523.25	10001	11000
75	529.25	10001	11011
76	535.25	10001	11110
77	541.25	10010	00001
78	547.25	10010	00100

95-000540

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Figure 2 - CHANNEL SWITCH SETTING CODES

TABLE 1 F.C.C. OFFSET FREQUENCIES

EIA CHANNEL	HISTORIC CHANNEL	F.C.C. OFFSET KHz	CHANNEL FREQUENCY INCL. OFFSET MHz
98	A-2	25.0	109.2750
99	A-1	25.0	115.2750
14	A	12.5	121.2625
15	B	12.5	127.2625
16	C	12.5	133.2625
25	L	12.5	229.2625
26	M	12.5	235.2625
27	N	12.5	241.2625
28	O	12.5	247.2625
29	P	12.5	253.2625
30	Q	12.5	259.2625
31	R	12.5	265.2625
32	S	12.5	271.2625
33	T	12.5	277.2625
34	U	12.5	283.2625
35	V	12.5	289.2625
36	W	12.5	295.2625
37	AA	12.5	301.2625
38	BB	12.5	307.2625
39	CC	12.5	313.2625
40	DD	12.5	319.2625
41	EE	12.5	325.2625
42	FF	25.0	331.2750
43	GG	12.5	337.2625
44	HH	12.5	343.2625
45	II	12.5	349.2625
46	JJ	12.5	355.2625
47	KK	12.5	361.2625
48	LL	12.5	367.2625
49	MM	12.5	373.2625
50	NN	12.5	379.2625
51	OO	12.5	385.2625
52	PP	12.5	391.2625
53	QQ	12.5	397.2625

TABLE 2 HRC CHANNEL CODES

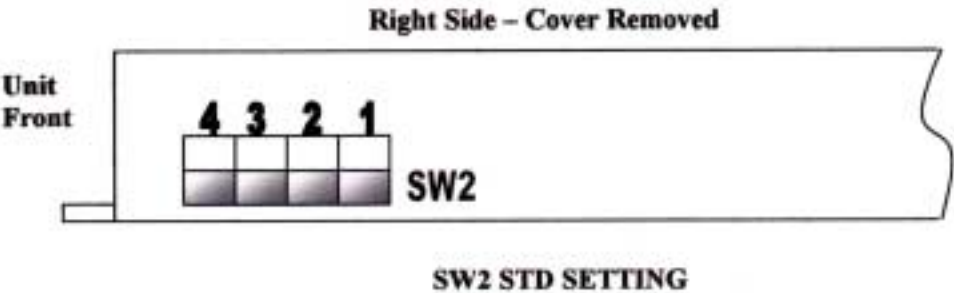
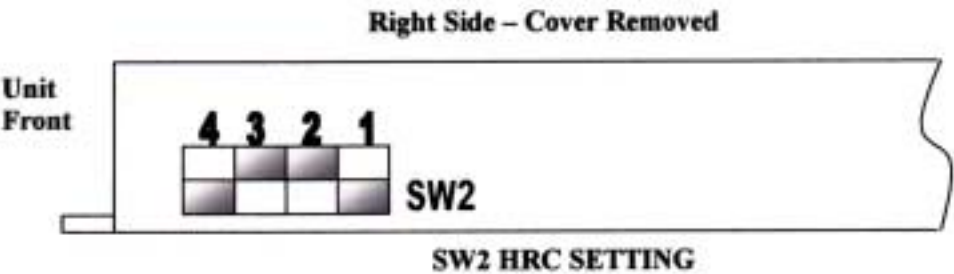
FREQUENCY MHz	EIA CHANNEL	HISTORIC CHANNEL	FRONT PANEL DIP SWITCH									
			1	2	3	4	5	6	7	8	9	10
54	2	2	0	1	0	1	0	0	1	1	0	1
60	3	3	0	1	0	1	0	1	0	0	0	0
66	4	4	0	1	0	1	0	1	0	0	1	1
78	5	5	0	1	0	1	0	1	1	0	0	1
84	6	6	0	1	0	1	0	1	1	1	0	0
174	7	7	0	1	1	0	0	0	1	0	0	1
180	8	8	0	1	1	0	0	0	1	1	0	0
186	9	9	0	1	1	0	0	0	1	1	1	1
192	10	10	0	1	1	0	0	1	0	0	1	0
198	11	11	0	1	1	0	0	1	0	1	0	1
204	12	12	0	1	1	0	0	1	1	0	0	0
210	13	13	0	1	1	0	0	1	1	0	1	1
120	14	A	0	1	0	1	1	0	1	1	1	0
126	15	B	0	1	0	1	1	1	0	0	0	1
132	16	C	0	1	0	1	1	1	0	1	0	0
138	17	D	0	1	0	1	1	1	0	1	1	1
144	18	E	0	1	0	1	1	1	1	0	1	0
150	19	F	0	1	0	1	1	1	1	1	0	1
156	20	G	0	1	1	0	0	0	0	0	0	0
162	21	H	0	1	1	0	0	0	0	0	1	1
168	22	I	0	1	1	0	0	0	0	1	1	0
216	23	J	0	1	1	0	0	1	1	1	1	0
222	24	K	0	1	1	0	1	0	0	0	0	1
228	25	L	0	1	1	0	1	0	0	1	0	0
234	26	M	0	1	1	0	1	0	0	1	1	1
240	27	N	0	1	1	0	1	0	1	0	1	0
246	28	O	0	1	1	0	1	0	1	1	0	1
252	29	P	0	1	1	0	1	1	0	0	0	0
258	30	Q	0	1	1	0	1	1	0	0	1	1
264	31	R	0	1	1	0	1	1	0	1	1	0
270	32	S	0	1	1	0	1	1	1	0	0	1
276	33	T	0	1	1	0	1	1	1	1	0	0
282	34	U	0	1	1	0	1	1	1	1	1	1
288	35	V	0	1	1	1	0	0	0	0	1	0
294	36	W	0	1	1	1	0	0	0	1	0	1
300	37	AA	0	1	1	1	0	0	1	0	0	0
306	38	BB	0	1	1	1	0	0	1	0	1	1
312	39	CC	0	1	1	1	0	0	1	1	1	0
318	40	DD	0	1	1	1	0	1	0	0	0	1
324	41	EE	0	1	1	1	0	1	0	1	0	0
330	42	FF	0	1	1	1	0	1	0	1	1	1
336	43	GG	0	1	1	1	0	1	1	0	1	0
342	44	HH	0	1	1	1	0	1	1	1	0	1
348	45	II	0	1	1	1	1	0	0	0	0	0
354	46	JJ	0	1	1	1	1	0	0	0	1	1
360	47	KK	0	1	1	1	1	0	0	1	1	0

TABLE 2 CONTINUED. HRC CHANNEL CODES

FREQUENCY MHz	EIA CHANNEL	HISTORIC CHANNEL	FRONT PANEL DIP SWITCH									
			1	2	3	4	5	6	7	8	9	10
366	48	LL	0	1	1	1	1	0	1	0	0	1
372	49	MM	0	1	1	1	1	0	1	1	0	0
378	50	NN	0	1	1	1	1	0	1	1	1	1
384	51	OO	0	1	1	1	1	1	0	0	1	0
390	52	PP	0	1	1	1	1	1	0	1	0	1
396	53	QQ	0	1	1	1	1	1	1	0	0	0
402	54	RR	0	1	1	1	1	1	1	0	1	1
408	55	SS	0	1	1	1	1	1	1	1	1	0
414	56	TT	1	0	0	0	0	0	0	0	0	1
420	57	UU	1	0	0	0	0	0	0	1	0	0
426	58	VV	1	0	0	0	0	0	0	1	1	1
432	59	WW	1	0	0	0	0	0	1	0	1	0
438	60	XX	1	0	0	0	0	0	1	1	0	1
444	61	YY	1	0	0	0	0	1	0	0	0	0
450	62	ZZ	1	0	0	0	0	1	0	0	1	1
456	63	63	1	0	0	0	0	1	0	1	1	0
462	64	64	1	0	0	0	0	1	1	0	0	1
468	65	65	1	0	0	0	0	1	1	1	0	0
474	66	66	1	0	0	0	0	1	1	1	1	1
480	67	67	1	0	0	0	1	0	0	0	1	0
486	68	68	1	0	0	0	1	0	0	1	0	1
492	69	69	1	0	0	0	1	0	1	0	0	0
498	70	70	1	0	0	0	1	0	1	0	1	1
504	71	71	1	0	0	0	1	0	1	1	1	0
510	72	72	1	0	0	0	1	1	0	0	0	1
516	73	73	1	0	0	0	1	1	0	1	0	0
522	74	74	1	0	0	0	1	1	0	1	1	1
528	75	75	1	0	0	0	1	1	1	0	1	0
534	76	76	1	0	0	0	1	1	1	1	0	1
540	77	77	1	0	0	1	0	0	0	0	0	0
546	78	78	1	0	0	1	0	0	0	0	1	1

Figure - 3 INTERNAL SW2 SETTINGS FOR HRC / STD

NOTE: For HRC operation internal switch SW2 must be set as illustrated below.



4.) REAR PANEL

The rear panel of each module has its audio and video inputs and its RF output. The audio and video inputs are RCA type phono jacks and the RF output is a type "F".

5.) VIDEO MODULATION ADJUSTMENT (Each modulator).

LCM-550X12 modulator modules are preset at the factory for 85% depth of modulation with a 1V P-P pulse and bar test signal. If the video modulation needs to be adjusted, follow the procedure below.

Connect the video source (to be used at approximately 1V P-P) to the video input phono jack. The video should be of a reasonably bright scene (commercials are usually excellent).

Adjust the video modulation control on the front panel to obtain approximately 85% depth-of modulation as measured on a spectrum analyzer or other test equipment capable of this measurement.

If the video modulation control needs to be set and there is no test equipment available, it can be set fairly close by comparison. View a video signal on a properly adjusted television receiver or receiver/monitor. Apply the same signal if possible, or one of equivalent brightness and contrast to the modulator that needs to be set. View the output of this modulator on the same receiver and adjust the video modulation control for brightness and contrast equivalent to the directly viewed picture. Use caution and do not set this control too high.

6.) AUDIO MODULATION ADJUSTMENT (Each modulator).

Connect the audio source (to be used at approximately 500mV P-P) to the audio input phono jack.

Monitor the audio on a television receiver and adjust the audio modulation control for proper loudness as compared with some channel known to be modulating at the correct level (such as a broadcast station).

The two sources of audio should be very similar in their content and should be near maximum loudness as compared to the average level of their program. In other words, compare a loud passage with a loud passage and set the audio modulation control with this program material. Use caution and do not set this control too high.

7.) OPERATION WITH COMPOSITE BASEBAND BTSC AUDIO INPUT (Each modulator).

The LCM-550X12 modulators are compatible with a composite baseband BTSC audio input. An internal jumper must be changed to remove audio pre-emphasis as required for this application.

To remove audio pre-emphasis, disconnect and remove the LCM-550 module from the main shelf and remove its left side cover. Cut board where indicated.

Replace the module cover, replace the module in the main shelf, and set-up the audio deviation per the instructions for the BTSC generator being used.

8.) RF OUTPUT AND AURAL CARRIER LEVEL ADJUSTMENT (Each modulator).

- A) Using a field strength meter or spectrum analyzer, set the video carrier to the desired level with the output level (RF) control (typically +40 to +45dBmV).
- B) Tune the field strength meter to the aural carrier, which is located 4.5 MHz above the video carrier.
- C) Adjust the aural carrier level control (A/V) to the desired level, typically 15dB below the video carrier.
CAUTION: Reducing the aural \ visual carrier ratio to less than 15dB can result in high out-of-band spurious signals on adjacent channels.

9.) MISCELLANEOUS

- A) The front panel adjustments (RF, OFFSET, etc.) are small, and somewhat delicate. Use CAUTION and an adjustment tool that is a proper fit when adjusting these controls.
- B) The LCM-550X12 is BTSC stereo compatible. Each modulator is shipped in the “mono” mode. To defeat the pre-emphasis in order to use a composite baseband BTSC input signal, see section 7 of this manual.
- C) The LCM-550X12 power supply is equipped with an internal 3Amp. 250V GMA fuse. For continued safety, and to maintain proper performance of the unit, please replace only with an equivalent fuse.



LCM-550X12

PAL I ADDENDUM

INSTRUCTION MANUAL

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LCM-550X12

PAL I

Specifications

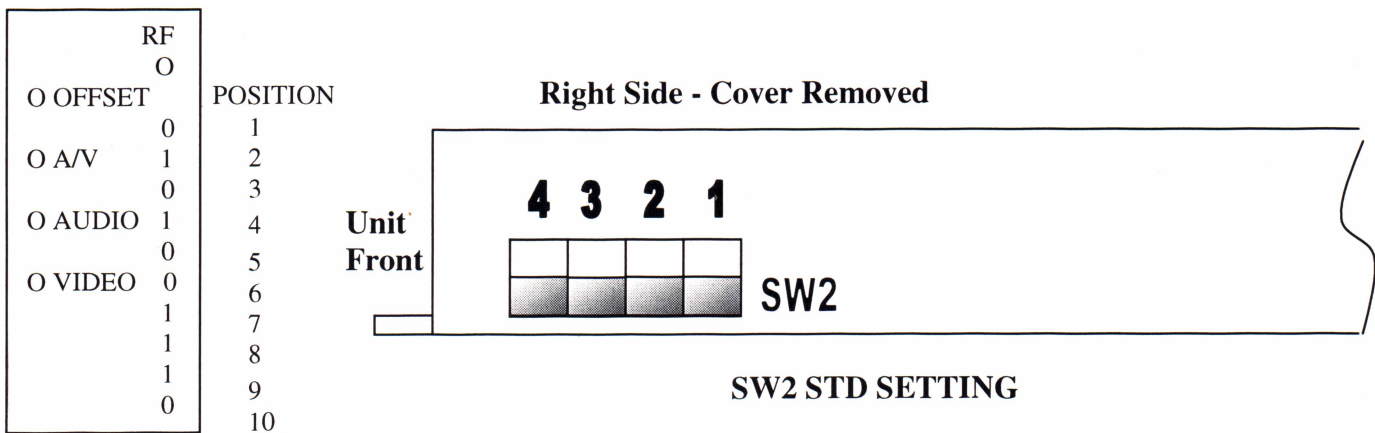
Output Frequency Range	48.25MHz to 551.25MHz. Selectable by front panel DIP switch in 2MHz increments (250KHz internal adjustment)
Frequency Offset	+12.5KHz tunable by front panel adjustment
Output Power Level	+40dBmV minimum per channel, +45dBmV typical
Frequency Accuracy / Stability	<±5KHz of selected channel frequency (+10°C to +40°C)
Video Performance	1V P-P input nominal for 80% modulation. Differential gain <5% Differential Phase <5°
Spurious Outputs	>55dB below output visual carrier level, 60dB typical
Out-of-Band C/N	>76dB as measured in a 4.0MHz noise bandwidth
In-Band C/N	>60dB as measured in a 4.0MHz noise bandwidth
Audio / Video Ratio	Adjustable from 13dB to 20dB below video carrier
Audio Performance	500mV P-P for 50KHz deviation, front panel adjustable. 10K input Z
Audio Inter-carrier Stability	6.0MHz within ±1KHz
Front Panel Controls	RF output adjust A/V ratio adjust Video & Audio modulation Frequency offset adjust Channel select DIP switches
Power Requirements	85-264VAC, 47-63Hz, 72 watts
Chassis Size	3.5"H x 19"W x 11"D (Rack mount chassis)

CHANNEL SELECTION

Channels are selected with 10 front panel DIP Switches and 3 internal DIP switches.

0=Switch in RIGHT Position

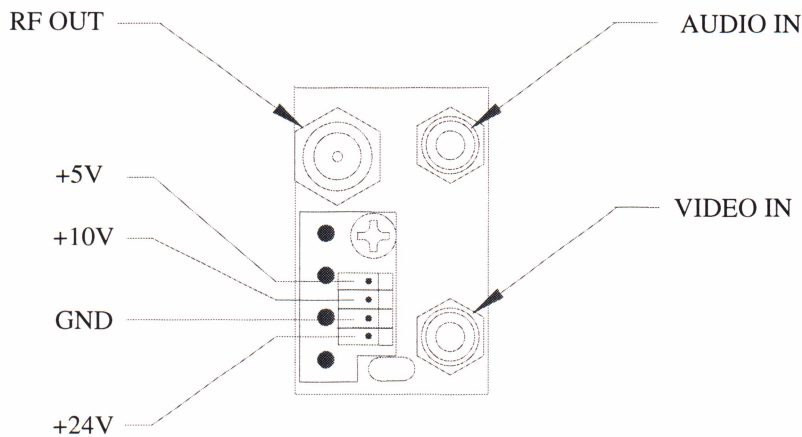
1=Switch in LEFT Position



Settings shown above are for channel 1, 55.25MHz.

REAR PANEL

The rear panel of each module has Audio and Video inputs, RF output and Power In. The Audio and Video inputs are RCA type phono jacks and the RF output is type “F”.



LCM-550-I Dip Switch Settings

CH	FREQ.	SW	SETTINGS	SW2 4321	CH	FREQ.	SW	SETTINGS	SW2 4321
1	55.250	01010	01110	000X	28	295.250	01110	00110	000X
2	63.250	01010	10010	000X	29	303.250	01110	01010	000X
3	71.250	01010	10110	000X	30	311.250	01110	01110	000X
4	79.250	01010	11010	000X	31	319.250	01110	10010	000X
**	87.250	01010	11110	000X	32	327.250	01110	10110	000X
**	95.250	01011	00010	000X	33	335.250	01110	11010	000X
**	103.250	01011	00110	000X	34	343.250	01110	11110	000X
5	111.250	01011	01010	000X	35	351.250	01111	00010	000X
6	119.250	01011	01110	000X	36	359.250	01111	00110	000X
7	127.250	01011	10010	000X	37	367.250	01111	01010	000X
8	135.250	01011	10110	000X	38	375.250	01111	01110	000X
9	143.250	01011	11010	000X	39	383.250	01111	10010	000X
10	151.250	01011	11110	000X	40	391.250	01111	10110	000X
11	159.250	01100	00010	000X	41	399.250	01111	11010	000X
12	167.250	01100	00110	000X	42	407.250	01111	11110	000X
13	175.250	01100	01010	000X	43	415.250	10000	00010	000X
14	183.250	01100	01110	000X	44	423.250	10000	00110	000X
15	191.250	01100	10010	000X	45	431.250	10000	01010	000X
16	199.250	01100	10110	000X	46	439.250	10000	01110	000X
17	207.250	01100	11010	000X	47	447.250	10000	10010	000X
18	215.250	01100	11110	000X	48	455.250	10000	10110	000X
19	223.250	01101	00010	000X	49	463.250	10000	11010	000X
20	231.250	01101	00110	000X	50	471.250	10000	11110	000X
21	239.250	01101	01010	000X	51	479.250	10001	00010	000X
22	247.250	01101	01110	000X	52	487.250	10001	00110	000X
23	255.250	01101	10010	000X	53	495.250	10001	01010	000X
24	263.250	01101	10110	000X	54	503.250	10001	01110	000X
25	271.250	01101	11010	000X	55	511.250	10001	10010	000X
26	279.250	01101	11110	000X	56	519.250	10001	10110	000X
27	287.250	01110	00010	000X	57	527.250	10001	11010	000X
					58	535.250	10001	11110	000X
					59	543.250	10010	00010	000X
					60	551.250	10010	00110	000X

0= Switch in RIGHT Position (ON)
1= Switch in LEFT Position (OFF)
X= Don't care
**= Channel Number Unknown



LCM-550X12

PAL B/G ADDENDUM

INSTRUCTION MANUAL

Phone: (209) 586-1022
(800) 545-1022
Fax: (209) 586-1026
E-Mail: salesupport@olsontech.com
www.olsontech.com

LCM-550X12
PAL B/G

SPECIFICATIONS

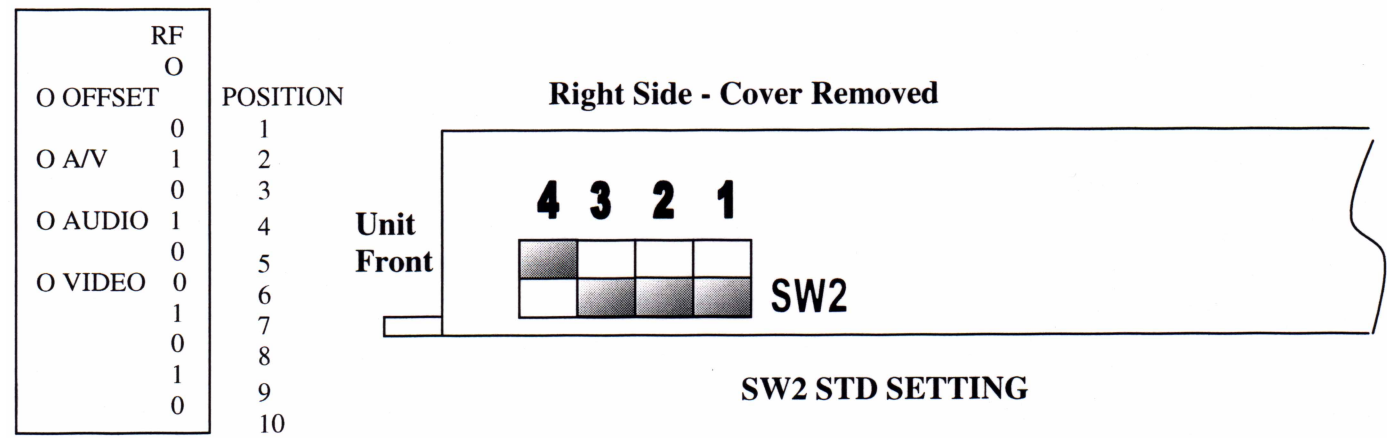
Output Frequency Range	48.25MHz to 551.25MHz. Selectable by front panel DIP switch in 2MHz increments (250KHz internal adjustment)
Frequency Offset	+12.5KHz tunable by front panel adjustment
Output Power Level	+40dBmV minimum per channel, +45dBmV typical
Frequency Accuracy / Stability	<±5KHz of selected channel frequency (+10°C to +40°C)
Video Performance	1V P-P input nominal for 80% modulation. Differential gain <5% Differential Phase <5°
Spurious Outputs	>55dB below output visual carrier level, 60dB typical
Out-of-Band C/N	>76dB as measured in a 4.0MHz noise bandwidth
In-Band C/N	>60dB as measured in a 4.0MHz noise bandwidth
Audio / Video Ratio	Adjustable from 13dB to 20dB below video carrier
Audio Performance	500mV P-P for 50KHz deviation, front panel adjustable. 10K input Z
Audio Inter-carrier Stability	5.5MHz within ±1KHz
Front Panel Controls	RF output adjust A/V ratio adjust Video & Audio modulation Frequency offset adjust Channel select DIP switches
Power Requirements	85-264VAC, 47-63Hz, 72 watts
Chassis Size	3.5"H x 19"W x 11"D (Rack mount chassis)

CHANNEL SELECTION

Channels are selected with 10 front panel DIP Switches and 3 internal DIP switches.

0=Switch in RIGHT Position

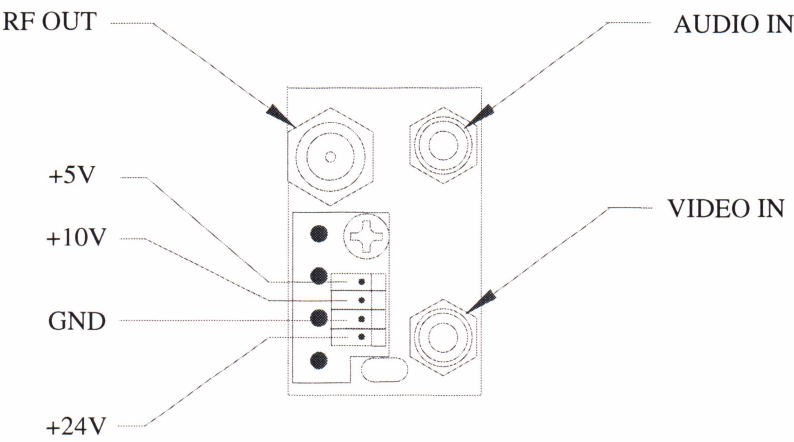
1=Switch in LEFT Position



Settings shown above are for channel 2, 48.25MHz.

REAR PANEL

The rear panel of each module has Audio and Video inputs, RF output and Power In. The Audio and Video inputs are RCA type phono jacks and the RF output is type “F”.



LCM-550 B/G Dip Switch Settings

7 MHz Channel Spacing

CH	FREQ.	SW SETTINGS	SW2 4321
2 E2	48.250	01010 01010	100X
*3 E3	55.250	01010 01110	000X
4 E4	62.250	01010 10001	100X
*5 X	69.250	01010 10101	000X
6 Y	76.250	01010 11000	100X
*7 Z	83.250	01010 11100	000X
8 Z+1	90.250	01010 11111	100X
*9 Z+2	97.250	01011 00011	000X
*10 S1	105.250	01011 00111	000X
11 S2	112.250	01011 01010	100X
*12 S3	119.250	01011 01110	000X
13 S4	126.250	01011 10001	100X
*14 S5	133.250	01011 10101	000X
15 S6	140.250	01011 11000	100X
*16 S7	147.250	01011 11100	000X
17 S8	154.250	01011 11111	100X
*18 S9	161.250	01100 00011	000X
19 S10	168.250	01100 00110	100X
*20 E5	175.250	01100 01010	000X
21 E6	182.250	01100 01101	100X
*22 E7	189.250	01100 10001	000X
23 E8	196.250	01100 10100	100X
*24 E9	203.250	01100 11000	000X
25 E10	210.250	01100 11011	100X
*26 E11	217.250	01100 11111	000X
27 E12	224.250	01101 00010	100X
*28 S11	231.250	01101 00110	000X
29 S12	238.250	01101 01001	100X
*30 S13	245.250	01101 01101	000X
31 S14	252.250	01101 10000	100X
*32 S15	259.250	01101 10100	000X
33 S16	266.250	01101 10111	100X
*34 S17	273.250	01101 11011	000X
35 S18	280.250	01101 11110	100X
*36 S19	287.250	01110 00010	000X
37 S20	294.250	01110 00101	100X

0= Switch in RIGHT Position (ON)
 1= Switch in LEFT Position (OFF)
 X= Don't Care

8 MHz Channel Spacing

CH	FREQ.	SW SETTINGS	SW2 4321
38	303.250	01110 01001	110X
39	311.250	01110 01101	110X
40	319.250	01110 10001	110X
41	327.250	01110 10101	110X
42	335.250	01110 11001	110X
43	343.250	01110 11101	110X
44	351.250	01111 00001	110X
45	359.250	01111 00101	110X
46	367.250	01111 01001	110X
47	375.250	01111 01101	110X
48	383.250	01111 10001	110X
49	391.250	01111 10101	110X
50	399.250	01111 11001	110X
51	407.250	01111 11101	110X
52	415.250	10000 00001	110X
53	423.250	10000 00101	110X
54	431.250	10000 01001	110X
55	439.250	10000 01101	110X
56	447.250	10000 10001	110X
57	455.250	10000 10101	110X
58	463.250	10000 11001	110X
59	471.250	10000 11101	110X
60	479.250	10001 00001	110X
61	487.250	10001 00101	110X
62	495.250	10001 01001	110X
63	503.250	10001 01101	110X
64	511.250	10001 10001	110X
65	519.250	10001 10101	110X
66	527.250	10001 11001	110X
67	535.250	10001 11101	110X
68	543.250	10010 00001	110X
69	551.250	10010 00101	110X

NOTE: Remove RIGHT Cover to gain access to SW2

SW2

*(ODD)				No *(EVEN)				8MHz Spacing			



LCD-550

LOW COST AGILE

TELEVISION DEMODULATOR

INSTRUCTION MANUAL

Phone: (209) 586-1022
(800) 545-1022
Fax: (209) 586-1026
E-Mail: salesupport@olsontech.com
www.olsontech.com

CAUTION!

USE CARE WHEN CHANGING CHANNELS OR MAKING ADJUSTMENTS TO THE LCD-550 MODULES

These units are very small and they use smaller (and more delicate) components than are normally found in larger equipment.

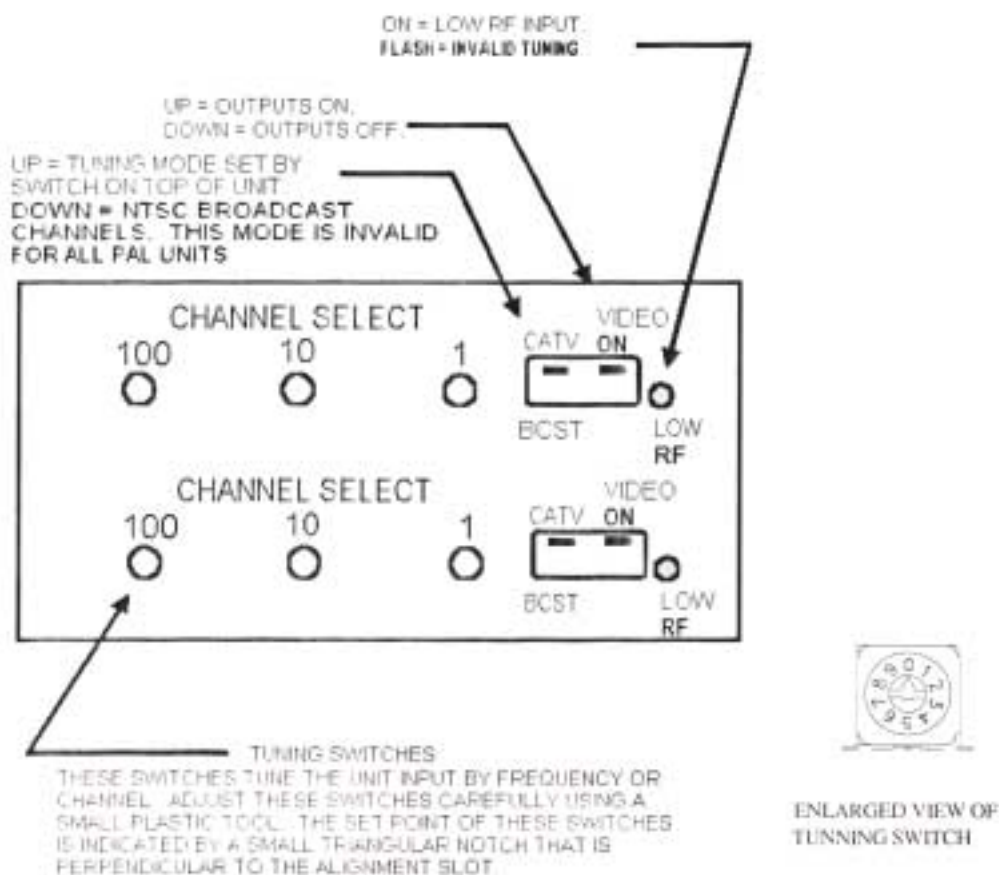
The DIP switch levers can be damaged by excessive force. Use a small pointed object to gently move the switch levers to the required positions.

The rotating controls can be pushed-in and broken if too much force is applied against them. When adjusting these controls, use caution and an alignment tool in good condition that is a good fit to the control slot.

FRONT PANEL CONTROLS

Front panel controls should be adjusted only with plastic alignment tools. Damage may result if metal tools are used. Refer to the following figure for the location of the front panel controls.

Figure 1



The LOW RF LED turns on with low or missing RF input. It also flashes on invalid tuning or mode settings. All outputs are squelched with low RF or invalid tuning.

The VIDEO ON dipswitch turns all outputs on and off.

The CATV-BCST dipswitch changes the tuning mode. In the CATV position the tuning mode is set by the tuning mode switch on the top of the demod. The BCST mode tunes NTSC broadcast VHF/UHF channels. This mode is invalid for all PAL units.

The channel select switches tune the RF input frequency. The set point of these switches is indicated by a small triangular notch that is perpendicular to the adjustment slot. When tuning by frequency, these switches are the frequency in MHz, with the .25MHz steps set by the tuning mode switch.

OPERATION

Most adjustments require removing the top cover. To access the bottom unit in a dual version, remove the 2 screws holding the top demod to the front panel. To access the internal adjustments, it is not necessary to remove the demod from the front panel; just remove the top cover screws. Figure 2 shows the adjustment locations. When all adjustments are complete, replace the top cover. For dual units, repeat this process for the top unit.

MODE SWITCH

This switch selects the CATV tuning mode. It is accessed through a hole in the top cover. Note that PAL units tune by frequency only. Positions 0-2 select traditional channel plans. Positions 3-5 select EIA standard channel plans. Positions 6-9 select direct frequency tuning.

S W	OLSON TECH PLANS	S W	EIA STANDARD PLANS	S W	FREQUENCY
0	CATV	3	CATV	6	MHZ + 0
1	HRC	4	HRC	7	MHZ + .25
2	IRC	5	IRC	8	MHZ + .5
				9	MHZ + .75

TROUBLESHOOTING

No output, low RF LED on:

- RF input low or absent.

- Incorrect tuning mode or channel.

 - Check the small triangular notch for switch settings.

No output, low RF LED flashes:

- Invalid tuning. Check tuning and mode switches. PAL units tune by frequency only. Broadcast channel mode is also invalid for PAL.

Video output very high contrast and distorted:

- Video output is unterminated.

Video output washed out:

- Video output is double terminated.

Audio problems:

- Verify correct jumper settings. Pre-emphasis setting on modulator must match that of demodulator.

LCD-550-X1

SPECIFICATIONS

RF Input.....	NTSC 54 to 801.25MHz
RF Input Level.....	Off-air -10dBmV to +25dBmV CATV -10dBmV to +10dBmV
Video Output.....	1V p-p +/- 5 IRE into 75 Ω
Video Performance.....	Diff. gain < 5% Diff. phase < 3°
Audio Output Types.....	Normal Audio Multiplex Audio Subcarrier (selected by internal jumpers)
Audio Output.....	500 mV p-p into 600 Ω unbalanced
MPX Audio Output (NTSC).....	500 mV p-p into 600 Ω unbalanced
Audio Subcarrier Output.....	> +40dBmV into 75 Ω unbalanced
Front Panel Controls.....	Output on/off CATV/Broadcast Rotary tuning switches
Front Panel Indicator.....	Low RF
Rear Panel Connectors.....	RF in, Video out...type "F" Audio...RCA
Power Requirements.....	< 2 watts from LCM-550 RKA chassis (5V @ 165mA and 10V @ 30mA typical)
Size.....	1.3x3x6
Weight.....	< 1 lb.

CHANNEL PLANS

Frequencies shown are rounded to 2 decimal places. 121.26 indicates a 12.5KHz off-set or 121.2625 assignment. 331.27 is actually 331.2750. The HRC frequencies are based on a harmonic of 6.0003MHz. The LCD-550 has AFC that will tune to these offsets without any special adjustment.

Olson Tech Channel Plan				EIA Standard Channel Plan				OFF-AIR	
Channel No.	STD	HRC	IRC	Chan.	STD	HRC	IRC	Chan.	BCST
2	55.25	54.00	55.26	2	55.25	54.00	55.26	2	55.25
3	61.25	60.00	61.26	3	61.25	60.00	61.26	3	61.25
4	67.25	66.00	67.26	4	67.25	66.00	67.26	4	67.25
5 (A-7)	77.25	78.00	79.26	5 (A-7)	77.25	78.00	79.26	5	77.25
6 (A-6)	83.25	84.00	85.26	6 (A-6)	83.25	84.00	85.26	6	83.25
7	175.25	174.01	175.26	7	175.25	174.01	175.26	7	175.25
8	181.25	180.01	181.26	8	181.25	180.01	181.26	8	181.25
9	187.25	186.01	187.26	9	187.25	186.01	187.26	9	187.25
10	193.25	192.01	193.26	10	193.25	192.01	193.26	10	193.25
11	199.25	198.01	199.26	11	199.25	198.01	199.26	11	199.25
12	205.25	204.01	205.26	12	205.25	204.01	205.26	12	205.25
13	211.25	210.01	211.26	13	211.25	210.01	211.26	13	211.25
14 (A)	121.26	120.01	121.26	14 (A)	121.26	120.01	121.26	14	471.25
15 (B)	127.26	126.01	127.26	15 (B)	127.26	126.01	127.26	15	477.25
16 (C)	133.26	132.01	133.26	16 (C)	133.26	132.01	133.26	16	483.25
17 (D)	139.25	138.01	139.26	17 (D)	139.25	138.01	139.26	17	489.25
18 (E)	145.25	144.01	145.26	18 (E)	145.25	144.01	145.26	18	495.25
19 (F)	151.25	150.01	151.26	19 (F)	151.25	150.01	151.26	19	501.25
20 (G)	157.25	156.01	157.26	20 (G)	157.25	156.01	157.26	20	507.25
21 (H)	163.25	162.01	163.26	21 (H)	163.25	162.01	163.26	21	513.25
22 (I)	169.25	168.01	169.26	22 (I)	169.25	168.01	169.26	22	519.25

Olson Tech Channel Plan			
Channel No.	STD	HRC	IRC
23 (J)	217.25	216.01	217.26
24 (K)	223.25	222.01	223.26
25 (L)	229.26	228.01	229.26
26 (M)	235.26	234.01	235.26
27 (N)	241.26	240.01	241.26
28 (O)	247.26	246.01	247.26
29 (P)	253.26	252.01	253.26
30 (Q)	259.26	258.01	259.26
31 (R)	265.26	264.01	265.26
32 (S)	271.26	270.01	271.26
33 (T)	277.26	276.01	277.26
34 (U)	283.26	282.01	283.26
35 (V)	289.26	288.01	289.26
36 (W)	295.26	294.01	295.26
37 (AA)	301.26	300.02	301.26
38 (BB)	307.26	306.02	307.26
39 (CC)	313.26	312.02	313.26
40 (DD)	319.26	318.02	319.26
41 (EE)	325.26	324.02	325.26
42 (FF)	331.28	330.02	331.28
43 (GG)	337.26	336.02	337.26
44 (HH)	343.26	342.02	343.26
45 (II)	349.26	348.02	349.26
46 (JJ)	355.26	354.02	355.26
47 (KK)	361.26	360.02	361.26
48 (LL)	367.26	366.02	367.26
49 (MM)	373.26	372.02	373.26

EIA Standard Channel Plan			
Chan.	STD	HRC	IRC
23 (J)	217.25	216.01	217.26
24 (K)	223.25	222.01	223.26
25 (L)	229.26	228.01	229.26
26 (M)	235.25	234.01	235.26
27 (N)	241.26	240.01	241.26
28 (O)	247.26	246.01	247.26
29 (P)	253.26	252.01	253.26
30 (Q)	259.26	258.01	259.26
31 (R)	265.26	264.01	265.26
32 (S)	271.26	270.01	271.26
33 (T)	277.26	276.01	277.26
34 (U)	283.26	282.01	283.26
35 (V)	289.26	288.01	289.26
36 (W)	295.26	294.01	295.26
37 (AA)	301.26	300.02	301.26
38 (BB)	307.26	306.02	307.26
39 (CC)	313.26	312.02	313.26
40 (DD)	319.26	318.02	319.26
41 (EE)	325.26	324.02	325.26
42 (FF)	331.28	330.02	331.28
43 (GG)	337.26	336.02	337.26
44 (HH)	343.26	342.02	343.26
45 (II)	349.26	348.02	349.26
46 (JJ)	355.26	354.02	355.26
47 (KK)	361.26	360.02	361.26
48 (LL)	367.26	366.02	367.26
49 (MM)	373.26	372.02	373.26

OFF-AIR	
Chan	BCST
23	525.25
24	531.25
25	537.25
26	543.25
27	549.25
28	555.25
29	561.25
30	567.25
31	573.25
32	579.25
33	585.25
34	591.25
35	597.25
36	603.25
37	609.25
38	615.25
39	621.25
40	627.25
41	633.25
42	639.25
43	645.25
44	651.25
45	657.25
46	663.25
47	669.25
48	675.25
49	681.25

Olson Tech Channel Plan			
Channel No.	STD	HRC	IRC
50 (NN)	379.26	378.02	379.26
51 (OO)	385.26	384.02	385.26
52 (PP)	391.26	390.02	391.26
53 (QQ)	397.26	396.02	397.26
54 (A-8)	73.25	72.00	73.26
55 (A-7)	79.25	78.00	79.26
56 (A-6)	85.25	84.00	85.26
57 (A-5)	91.25	90.00	91.26
58 (A-4)	97.25	96.00	97.26
59 (A-3)	103.25	102.01	103.26
60 (A-2)	109.28	108.01	109.26
61 (A-1)	115.28	114.01	115.26
62 (RR)	403.25	402.02	403.26
63 (SS)	409.25	408.02	409.26
64 (TT)	415.25	414.02	415.26
65 (UU)	421.25	420.02	421.26
66 (VV)	427.25	426.02	427.26
67 (WW)	433.25	432.02	433.26
68 (XX)	439.25	438.02	439.26
69 (YY)	445.25	444.02	445.26
70 (ZZ)	451.25	450.02	451.26
71	457.25	456.02	457.26
72	463.25	462.02	463.26
73	469.25	468.02	469.26
74	475.25	474.02	475.26
75	481.25	480.02	481.26
76	487.25	486.02	487.26

EIA Standard Channel Plan			
Chan.	STD	HRC	IRC
50 (NN)	379.26	378.02	379.26
51 (OO)	385.26	384.02	385.26
52 (PP)	391.26	390.02	391.26
53 (QQ)	397.26	396.02	397.26
54 (RR)	403.25	402.02	403.26
55 (SS)	409.25	408.02	409.26
56 (TT)	415.25	414.02	415.26
57 (UU)	421.25	420.02	421.26
58 (VV)	427.25	426.02	427.26
59 (WW)	433.25	432.02	433.26
60 (XX)	439.25	438.02	439.26
61 (YY)	445.25	444.02	445.26
62 (ZZ)	451.25	450.02	451.26
63 (AAA)	457.25	456.02	457.26
64 (BBB)	463.25	462.02	463.26
65 (CCC)	469.25	468.02	469.26
66 (DDD)	475.25	474.02	475.26
67 (EEE)	481.25	480.02	481.26
68 (FFF)	487.25	486.02	487.26
69 (GGG)	493.25	492.02	493.26
70 (HHH)	499.25	498.02	499.26
71 (III)	505.25	504.03	505.26
72 (JJJ)	511.25	510.03	511.26
73 (KKK)	517.25	516.03	517.26
74 (LLL)	523.25	522.03	523.26
75 (MMM)	529.25	528.03	529.26
76 (NNN)	535.25	534.03	535.26

OFF-AIR	
Chan	BCST
50	687.25
51	693.25
52	699.25
53	705.25
54	711.25
55	717.25
56	723.25
57	729.25
58	735.25
59	741.25
60	747.25
61	753.25
62	759.25
63	765.25
64	771.25
65	777.25
66	783.25
67	789.25
68	795.25
69	801.25

Olson Tech Channel Plan			
Channel No.	STD	HRC	IRC
77	493.25	492.02	493.26
78	499.25	498.02	499.26
79	505.25	504.03	505.26
80	511.25	510.03	511.26
81	517.25	516.03	517.26
82	523.25	522.03	523.26
83	529.25	528.03	529.26
84	535.25	534.03	535.26
85	541.25	540.03	541.26
86	547.25	546.03	547.26
87	553.25	552.03	553.26
88	559.25	558.03	559.26
89	565.25	564.03	565.26
90	571.25	570.03	571.26
91	577.25	576.03	577.26
92	583.25	582.03	583.26
93	589.25	588.03	589.26
94	595.25	594.03	595.26
95	601.25	600.03	601.26
96	607.25	606.03	607.26
97	613.25	612.03	613.26
98	619.25	618.03	619.26
99	625.25	624.03	625.26
100	631.25	630.03	631.26
101	637.25	636.03	637.26
102	643.25	642.03	643.26
103	649.25	648.03	649.26

EIA Standard Channel Plan			
Chan.	STD	HRC	IRC
77 (OOO)	541.25	540.03	541.26
78 (PPP)	547.25	546.03	547.26
79 (QQQ)	553.25	552.03	553.26
80 (RRR)	559.25	558.03	559.26
81 (SSS)	565.25	564.03	565.26
82 (TTT)	571.25	570.03	571.26
83 (UUU)	577.25	576.03	577.26
84 (VVV)	583.25	582.03	583.26
85 (WWW)	589.25	588.03	589.26
86 (XXX)	595.25	594.03	595.26
87 (YYY)	601.25	600.03	601.26
88 (ZZZ)	607.25	606.03	607.26
89	613.25	612.03	613.26
90	619.25	618.03	619.26
91	625.25	624.03	625.26
92	631.25	630.03	631.26
93	637.25	636.03	637.26
94	643.25	642.03	643.26
95 (A-5)	91.25	90.00	91.26
96 (A-4)	97.25	96.00	97.26
97 (A-3)	103.25	102.01	103.26
98 (A-2)	109.28	108.03	109.28
99 (A-1)	115.28	114.03	115.28
100	649.25	648.03	649.26
101	655.25	654.03	655.26
102	661.25	660.03	661.26
103	667.25	666.03	667.26

Olson Tech Channel Plan				EIA Standard Channel Plan			
Channel No.	STD	HRC	IRC	Chan.	STD	HRC	IRC
104	655.25	654.03	655.26	104	673.25	672.03	673.26
105	661.25	660.03	661.26	105	679.25	678.03	679.26
106	667.25	666.03	667.26	106	685.25	684.03	685.26
107	673.25	672.03	673.26	107	691.25	690.03	691.26
108	679.25	678.03	679.26	108	697.25	696.03	697.26
109	685.25	684.03	685.26	109	703.25	702.04	703.26
110	691.25	690.03	691.26	110	709.25	708.04	709.26
111	697.25	696.03	697.26	111	715.25	714.04	715.26
112	703.25	702.04	703.26	112	721.25	720.04	721.26
113	709.25	708.04	709.26	113	727.25	726.04	727.26
114	715.25	714.04	715.26	114	733.25	732.04	733.26
115	721.25	720.04	721.26	115	739.25	738.04	739.26
116	727.25	726.04	727.26	116	745.25	744.04	745.26
117	733.25	732.04	733.26	117	751.25	750.04	751.26
118	739.25	738.04	739.26	118	757.25	756.04	757.26
119	745.25	744.04	745.26	119	763.25	762.04	763.26
120	751.25	750.04	751.26	120	769.25	768.04	769.26
121	757.25	756.04	757.26	121	775.25	774.04	775.26
122	763.25	762.04	763.26	122	781.25	780.04	781.26
123	769.25	768.04	769.26	123	787.25	786.04	787.26
124	775.25	774.04	775.26	124	793.25	792.04	793.26
125	781.25	780.04	781.26	125	799.25	798.04	799.26
126	787.25	786.04	787.26				
127	793.25	792.04	793.26				
128	799.25	798.04	799.26				

INTRODUCTION

The LCD-550 is a small low cost demodulator for use in cable and off-air applications. It is designed to mount in Olson Technology's LCM-550-RKA rack mountable chassis. The demodulator is shipped as a single LCD-550 and occupies 3 slots in the LCM-550 RKA chassis.

The LCD-550 can be made into a dual demodulator assembly by removing the front panel and guide pin on the second LCD-550 and installing on top of the first demodulator.

The units have a front panel switch that switches between NTSC broadcast channels and a user defined CATV tuning mode. The user can select from 6 NTSC channel plans and frequency tuning.

The units have a single RCA type audio output connector. The type of signal at this connector is selected from 3 types by internal jumpers. The user can choose normal audio, multiplex audio, or subcarrier. RF Input and Video Output connectors are "F" type. See Figure 2 for connector location.

The demods have an LED that indicates low input levels. This LED also flashes with invalid tuning settings. (LED is labeled "NO VIDEO" on some early models)

INSTALLATION

Units are shipped in the Olson Tech CATV tuning mode with normal audio output. If other settings are required, go to page 4 for instructions.

Slide the unit into the rack shelf, making sure that the notch on the rear of the unit engages the tab on the shelf. Install and tighten the front thumb screw.

Connect the Audio and Video Output cables and the RF Input cable. Note that the combiner on the rear of some LCM-550 rack shelves is for outputs, not inputs. It is recommended that units be added with the rack assembly powered down, but they can be added hot as long as the long ground pin makes contact first. Connect the power cable(s).

Set the tuning switches to the desired channel. If the unit is driving an LCM-550 with normal audio, no internal adjustments will be required. See Figure 1 for front panel controls.

INTERNAL CONTROLS

Refer to the following figure for the location of the internal controls

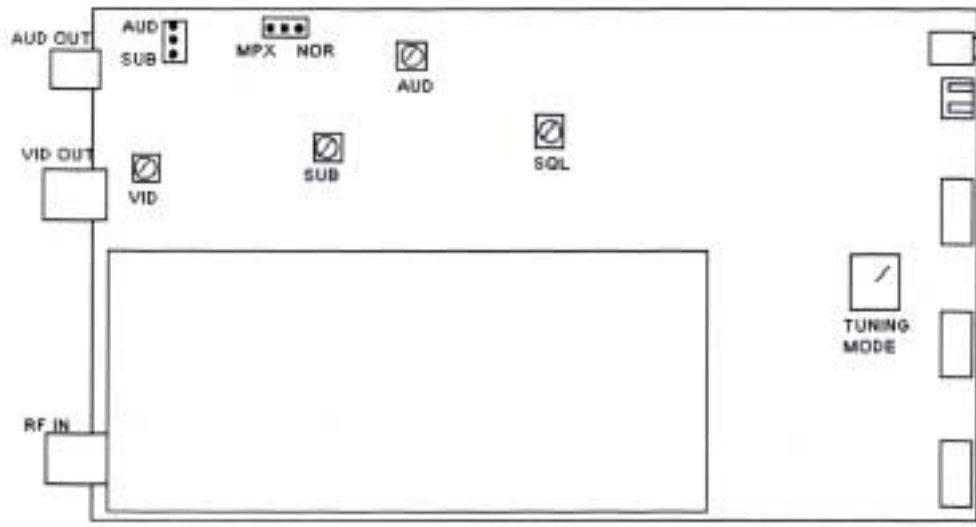


Figure 2

The VID pot sets the video output level. The video level should be measured into a 75ohm load.

The SUB pot sets the subcarrier output level. It does not affect the audio level.

The AUD pot sets the audio output level in both the normal and multiplex modes. It may need adjustment when changing between normal and multiplex outputs.

The SQL pot sets the low RF level where the outputs are squelched.

There are two jumpers that select the type of audio output. The AUD-SUB jumper selects between subcarrier and baseband audio outputs. If this jumper is in the AUD position, then the MPX-NOR jumper selects the type of baseband audio output.

The NOR position is normal audio output. In the MPX position, the audio de-emphasis is disabled. This is used for multiplex BTSC stereo. In the multiplex mode, the audio pre-emphasis on the associated modulator should also be disabled

AUDIO OUTPUT	AUD-SUB JUMPER	MPX-NOR JUMPER
SUBCARRIER	SUB	DONT CARE
NORMAL AUDIO	AUD	NOR
MULTIPLEXED AUDIO	AUD	MPX



LCD-550 PAL D/K

LOW COST AGILE

TELEVISION DEMODULATOR

INSTRUCTION MANUAL

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EAST EUROPE		
R CHANNELS	RUSSIA	VIDEO FREQ
	SC-22	319.25
	SC-23	327.25
	SC-24	335.25
	SC-25	343.25
	SC-26	351.25
	SC-27	359.25
	SC-28	367.25
	SC-29	375.25
	SC-30	383.25
	SC-31	391.25
	SC-32	399.25
	SC-33	407.25
	SC-34	415.25
	SC-35	423.25
	SC-36	431.25
	SC-37	439.25
	SC-38	447.25
	SC-39	455.25
	SC-40	463.25
	21	471.25
	22	479.25
	23	487.25
	24	495.25
	25	503.25
	26	511.25
	27	519.25
	28	527.25
	29	535.25
	30	543.25
	31	551.25

CHINA	
CHANNEL	VIDEO FREQ
30	647.25
31	655.25
32	663.25
33	671.25
34	679.25
35	687.25
36	695.25
37	703.25
38	711.25
39	719.25
40	727.25
41	735.25
42	743.25
43	751.25
44	759.25
45	767.25
46	775.25
47	783.25
48	791.25
49	799.25
50	807.25
51	815.25
52	823.25
53	831.25
54	839.25
55	847.25
56	855.25
57	863.25

CAUTION!

USE CARE WHEN CHANGING CHANNELS OR MAKING ADJUSTMENTS TO THE LCD-550 MODULES

These units are very small and they use smaller (and more delicate) components than are normally found in larger equipment.

The DIP switch levers can be damaged by excessive force. Use a small pointed object to gently move the switch levers to the required positions.

The rotating controls can be pushed-in and broken if too much force is applied against them. When adjusting these controls, use caution and an alignment tool in good condition that is a good fit to the control slot.

INTRODUCTION

The LCD-550 is a small low cost demodulator for use in cable and off-air applications. It is designed to mount in Olson Technology's LCM-550-RKA rack mountable chassis. The demodulator is shipped in both single (LCD-550X1) and dual (LCD-550X2) versions. Both versions occupy 3 slots in the LCM-550 RKA chassis.

The units have a single RCA type audio output connector. The type of signal at this connector is selected from 3 types by internal jumpers. The user can choose normal audio, multiplex audio, or subcarrier. RF Input and Video Output connectors are "F" type. See Figure 2 for connector location.

The demods have an LED that indicates low input levels. This LED also flashes with invalid tuning settings. (LED is labeled "NO VIDEO" on some early models)

INSTALLATION

Units are shipped in the + .25MHz frequency tuning mode with normal audio output. PAL versions tune by frequency only with three front panel rotary switches. If other settings are required, go to page 4 for instructions.

Slide the unit into the rack shelf, making sure that the notch on the rear of the unit engages the tab on the shelf. Install and tighten the front thumb screw.

Connect the Audio and Video Output cables and the RF Input cable. Note that the combiner on the rear of some LCM-550 rack shelves is for outputs, not inputs. It is recommended that units be added with the rack assembly powered down, but they can be added hot as long as the long ground pin makes contact first. Connect the power cable(s).

FRONT PANEL CONTROLS

Front panel controls should be adjusted only with plastic alignment tools. Damage may result if metal tools are used. Refer to the following figure for location of the front panel controls.

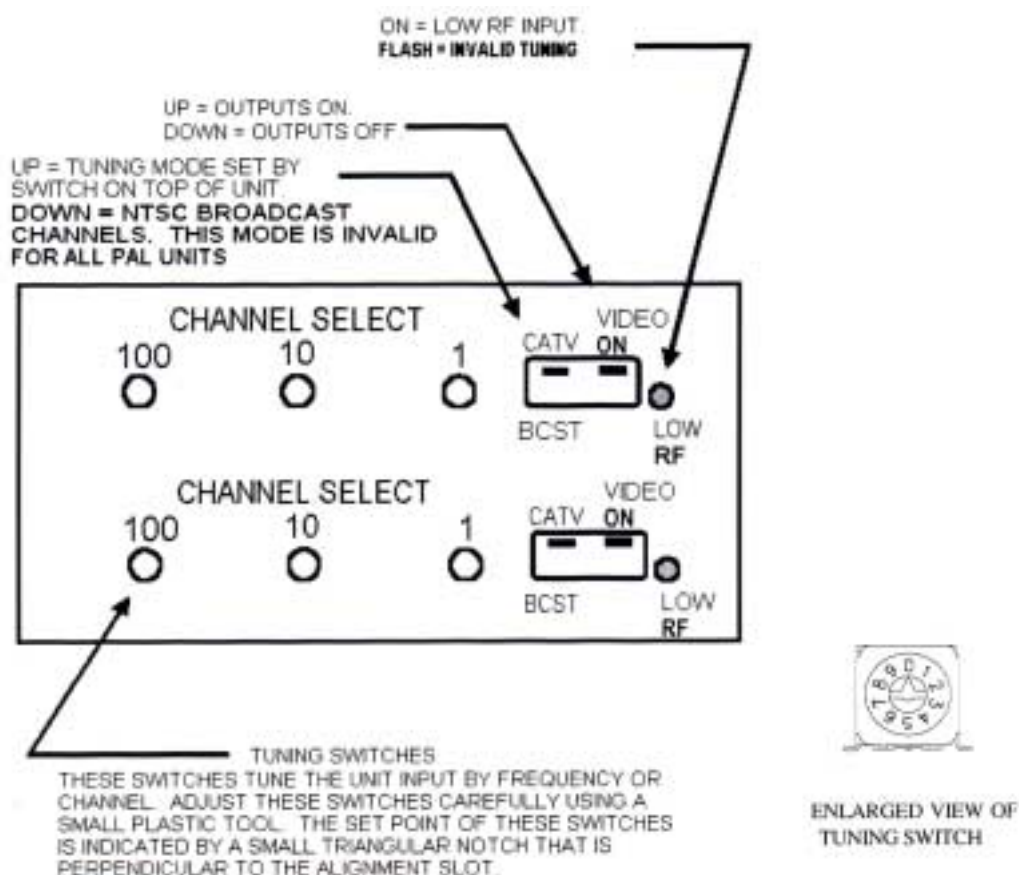


FIGURE 1

The LOW RF LED turns on with low or missing RF input. It also flashes on invalid tuning or mode settings. All outputs are squelched with low RF or invalid tuning.

The VIDEO ON dipswitch turns all outputs on and off.

The CATV-BCST dipswitch changes the tuning mode. In the CATV position the tuning mode is set by the tuning mode switch on the top of the demod. The BCST mode tunes NTSC broadcast VHF/UHF channels. This mode is invalid for all PAL units.

The channel select switches tune the RF input frequency. The set point of these switches is indicated by a small triangular notch that is perpendicular to the adjustment slot. When tuning by frequency, these switches are the frequency in MHz, with the .25MHz steps set by the tuning mode switch.

OPERATION

Most adjustments require removing the top cover. To access the bottom unit in a dual (X2) version, remove the 2 screws holding the top demod to the front panel. To access the internal adjustments, it is not necessary to remove the demod from the front panel; just remove the top cover screws. Figure 2 shows the adjustment locations. When all adjustments are complete, replace the top cover. For X2 units, repeat this process for the top unit.

MODE SWITCH

This switch selects the CATV tuning mode. It is accessed through a hole in the top cover. Only positions 6-9 are valid settings on PAL units. Positions 0-2 select traditional channel plans. Positions 3-5 select EIA standard channel plans. Positions 6-9 select direct frequency tuning.

SW	OLSON TECH PLANS	SW	EIA STANDARD PLANS	SW	FREQUENCY
0	CATV	3	CATV	6	MHZ + 0
1	HRC	4	HRC	7	MHZ + .25
2	IRC	5	IRC	8	MHZ + .5
				9	MHZ + .75

INTERNAL CONTROLS

Refer to the following figure for the location of the internal controls.

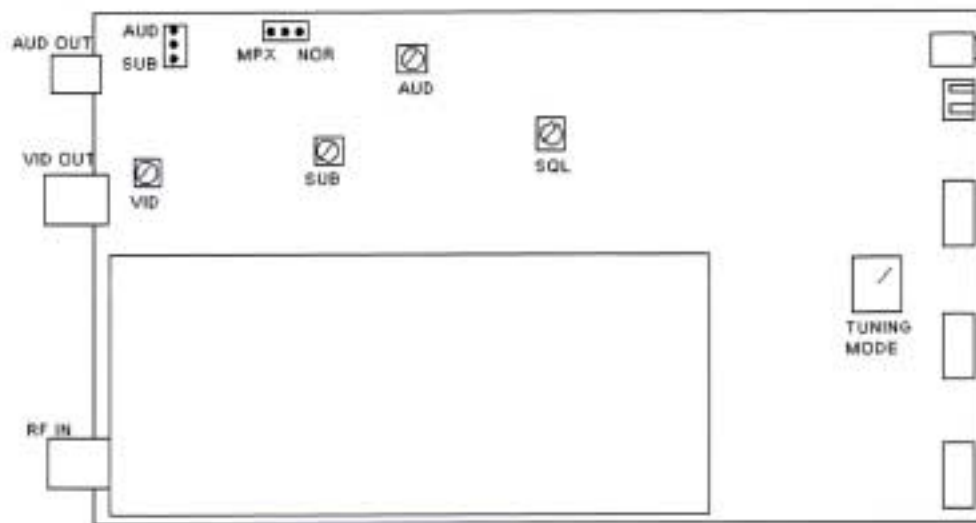


FIGURE 2

The VID pot sets the video output level. The video level should be measured into a 75ohm load.

The SUB pot sets the subcarrier output level. It does not affect the audio level.

The AUD pot sets the audio output level in both the normal and multiplex modes. It may need adjustment when changing between normal and multiplex outputs.

The SQL pot sets the low RF level where the outputs are squelched.

There are two jumpers that select the type of audio output. The AUD-SUB jumper selects between subcarrier and baseband audio outputs. If this jumper is in the AUD position, then the MPX-NOR jumper selects the type of baseband audio output.

The NOR position is normal audio output. In the MPX position, the audio de-emphasis is disabled. This is used for multiplex BTSC stereo. In the multiplex mode, the audio pre-emphasis on the associated modulator should also be disabled

AUDIO OUTPUT	AUD-SUB JUMPER	MPX-NOR JUMPER
SUBCARRIER	SUB	DONT CARE
NORMAL AUDIO	AUD	NOR
MULTIPLEXED AUDIO	AUD	MPX

TROUBLESHOOTING

No output, low RF LED on:

RF input low or absent.

Incorrect tuning mode or channel.

Check the small triangular notch for switch settings.

No output, low RF LED flashes:

Invalid tuning. Check tuning and mode switches. PAL units tune by frequency only. Broadcast channel mode is also invalid for PAL.

Video output very high contrast and distorted:

Video output is unterminated.

Video output washed out:

Video output is double terminated.

Audio problems:

Verify correct jumper settings. Pre-emphasis setting on modulator must match that of demodulator.

LCD-550 PAL D/K SPECIFICATIONS

RF Input	PAL D/K 49.75 to 863.25MHz
RF Input Level	Off-air -10dBmV to +25dBmV CATV -10dBmV to +10dBmV
Video Output	1V p-p +/- 5 IRE into 75 Ω
Video Performance	Diff. gain < 5% Diff. phase < 3°
Audio Output Types	Normal Audio Multiplex Audio Subcarrier (selected by internal jumpers)
Audio Output	500 mV p-p into 600 Ω unbalanced
MPX Audio Output	500 mV p-p into 600 Ω unbalanced
Audio Subcarrier Output	> +40dBmV into 75 Ω unbalanced
Front Panel Controls	Output on/off CATV/Broadcast (only CATV is valid on PAL units) Rotary tuning switches
Front Panel Indicator	Low RF
Rear Panel Connectors	RF in, Video out...type "F" Audio...RCA
Power Requirements	< 2 watts from LCM-550 RKA chassis (5V @ 165mA and 10V @ 30mA typical)
Size	1.3x3x6
Weight	< 1 lb.

PAL D/K Channels

EAST EUROPE		
R CHANNELS	RUSSIA	VIDEO FREQ
R1	1	49.75
	2	57.75
R2		59.25
	3	65.75
R3	4	77.25
R4	5	85.25
R5		93.25
	SC-1	111.25
	SC-2	119.25
	SC-3	127.25
	SC-4	135.25
	SC-5	143.25
	SC-6	151.25
	SC-7	159.25
	SC-8	167.25
R6	6	175.25
R7	7	183.25
R8	8	191.25
R9	9	199.25
R10	10	207.25
R11	11	215.25
R12	12	223.25
	SC-11	231.25
	SC-12	239.25
	SC-13	247.25
	SC14	255.25
	SC-15	263.25
	SC-16	271.25
	SC-17	279.25
	SC-18	287.25
	SC-19	295.25
	SC-20	303.25
	SC-21	311.25

CHINA	
CHANNEL	VIDEO FREQ
1	49.75
2	57.75
3	65.75
4	77.25
5	85.25
6	168.25
7	176.25
8	184.25
9	192.25
10	200.25
11	208.25
12	216.25
13	471.25
14	479.25
15	487.25
16	495.25
17	503.25
18	511.25
19	519.25
20	527.25
21	535.25
22	543.25
23	551.25
24	559.25
NOT DEFINED	567.25
NOT DEFINED	575.25
NOT DEFINED	583.25
NOT DEFINED	591.25
NOT DEFINED	599.25
25	607.25
26	615.25
27	623.25
28	631.25
29	639.25



LCM-550x12 AMPLIFIER

55 TO 870MHz DISTRIBUTION AMPLIFIER

INSTRUCTION MANUAL

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LCM-550x12
55 to 870MHz DISTRIBUTION AMPLIFIER

1) INTRODUCTION

The Olson Technology Inc. LCM-550x12 Series Amp is a high performance 55 to 870MHz distribution amplifier designed to work with the output of the 12-port combiner. It is easily attached to the back of the LCM-550x12 chassis by two thumb screws. It will provide +45dBmV of output per channel when connected to the output of the 12 port combiner.

This amplifier is powered from the LCM-550x12 power supply and it includes the required D.C. power interconnect harness. Also included with this amplifier is a cable to connect the 12 port combiner output to the amplifier input.

2) INSTALLATION

- A)** Attach the amplifier to the vertical lip at the rear of the LCM-550x12 chassis. The lip of the chassis fits into the slot at the bottom of the amplifier. The RF Output and Test Point connection should face to the rear. Loosen the two thumbscrews to allow the amplifier to sit all the way down on the shelf lip. Center the amplifier left to right and tighten the thumbscrews firmly to hold it in place.

- B)** Locate the D.C. power harness on the LCM-550x12 intended for the eighth module position (counting from the left side). If the harness is connected to a module, unplug it.

Plug this harness into the 4-pin power connector on the amplifier. Note that the connector is keyed to aid in plugging it in properly, but it CAN be forced on upside down. When correct, the RFD wire is in the TOP position. Do not plug it in upside down.

The D.C. power harness permanently attached to the amplifier is intended to provide power to the eighth module position. If there is a module in the eighth position that was disconnected earlier, connect this harness to it. Use the same caution as above to insure that the connector is not plugged in upside down. Note that on the modulator module, the redwire is on the BOTTOM.

- C)** Connect the provided RF cable between the combiner RF out and the amplifier RF input. Use caution not to damage or bend the small center conductor of this cable.

LCM-550x12
55 to 870MHz DISTRIBUTION AMPLIFIER

3) OPERATION

The LCM-550x12 amplifier is designed to operate at +45 dBmV out with 12 channels. Measure the direct output of the amplifier with a spectrum analyzer or signal level meter. Adjust the output level controls on the individual modulators for your desired operational levels. Exceeding the specified +45 dBmV maximum output level (12 channels) may cause system distortion levels to exceed acceptable levels. If all of your desired carrier levels are below +41 dBmV, Olson Technology suggests that you use a fixed attenuator pad between the combiner output and the amplifier input. Use a 3dB pad for maximum outputs of 35-41 dBmV, a 6dB pad for 35-38, etc. Once the output levels are set, the amplifier may be connected to its intended use and levels at its test point may be measured and recorded for reference. If the amplifier test point is used as an output, be sure that the main output is terminated in 75Ω.

4) SPECIFICATIONS

Frequency.....48MHz to 870MHz
Gain..... 22dB minimum
Gain Variation..... ±1dB minimum
Input Return Loss.....15dB minimum
Output Return Loss..... 16dB minimum
CTB/CSO with 12 Carriers..... >65dB below 12 output carriers at +45dBmV
Power Requirements..... Operates from LCM-550x12 power supply, <4 watts



LCM-550-FAC

**TWELVE-PORT COMBINER
FOR LCM-550X12 SERIES
INSTRUCTION MANUAL**

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**LCM-550-FAC
TWELVE PORT COMBINER
FOR LCM-550X12 SERIES**

1) INTRODUCTION

The OLSON TECHNOLOGY LCM-550-FAC is a 12-port combiner with a frequency range of 50-550MHz. Although this combiner is capable of operation to 870MHz, it is not specified beyond 550 MHz.

This field-installable combiner is designed to integrate with the LCM-550X12 Series system and mounts in place of the blank front panel at the top of the unit. RF interconnect cables are provided to enable connection to 12 modulator modules.

Twelve inputs and the common RF output are at the rear of the unit. For convenience, the (nominal) –20dB test point is accessible from the front of the unit.

Two other 12-port combiners are available from OLSON TECHNOLOGY: These units mount in standard 19" equipment racks and are 1 rack-unit high. The OTHC-12 has a frequency range of 5MHz to 550MHz and the OTHC-12-1G has a frequency range of 50MHz to 1000MHz.

2) INSTALLATION

If the LCM-550X12 Series system is mounted in an equipment rack, it must be removed or moved forward enough to provide access to the four screws on each side that secure the top front panel.

Remove the screws that secure the top front panel and remove the panel.

Using the screws removed above, mount the combiner in place of the blank front panel. If necessary, reinstall the system in the equipment rack.

Connect the RF cables to the modulators as required. Use caution not to damage or bend the small center conductors of these cables. The combined signals are available at the RF output connector.

3) OPERATION

Connect a spectrum analyzer or signal level meter to the RF output and adjust the individual modulators as required for the desired combined levels.

NOTE: This combiner has an insertion loss of between 17dB and 23dB. The LCM-550 modulators should not be operated above +45dBmV. Take these values into account when setting the output levels from the combiner. If higher output levels are required, the OLSON TECHNOLOGY LCM-550X12 amplifier is available. This amplifier mounts-to and is powered-by the LCM-550 Series system main chassis. It will operate at +45 dBmV out with 12 channels.

Once the levels have been set, the levels at the test point may be measured and recorded for future reference. Note that the RF output must be terminated in 75 Ω when making these test point measurements.

4) SPECIFICATIONS

FREQUENCY.....	50MHz to 550MHz
INSERTION LOSS.....	20 ±3.0dB
TEST POINT LOSS.....	20 ±3.0dB
PORT-TO-PORT ISOLATION.....	35dB Minimum
RETRUN LOSS.....	13dB Minimum
CONNECTOR.....	Type “F” - (ALL)