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LCD-550

LOW COST AGILE
TELEVISION DEMODULATOR

INSTRUCTION MANUAL

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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.

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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).

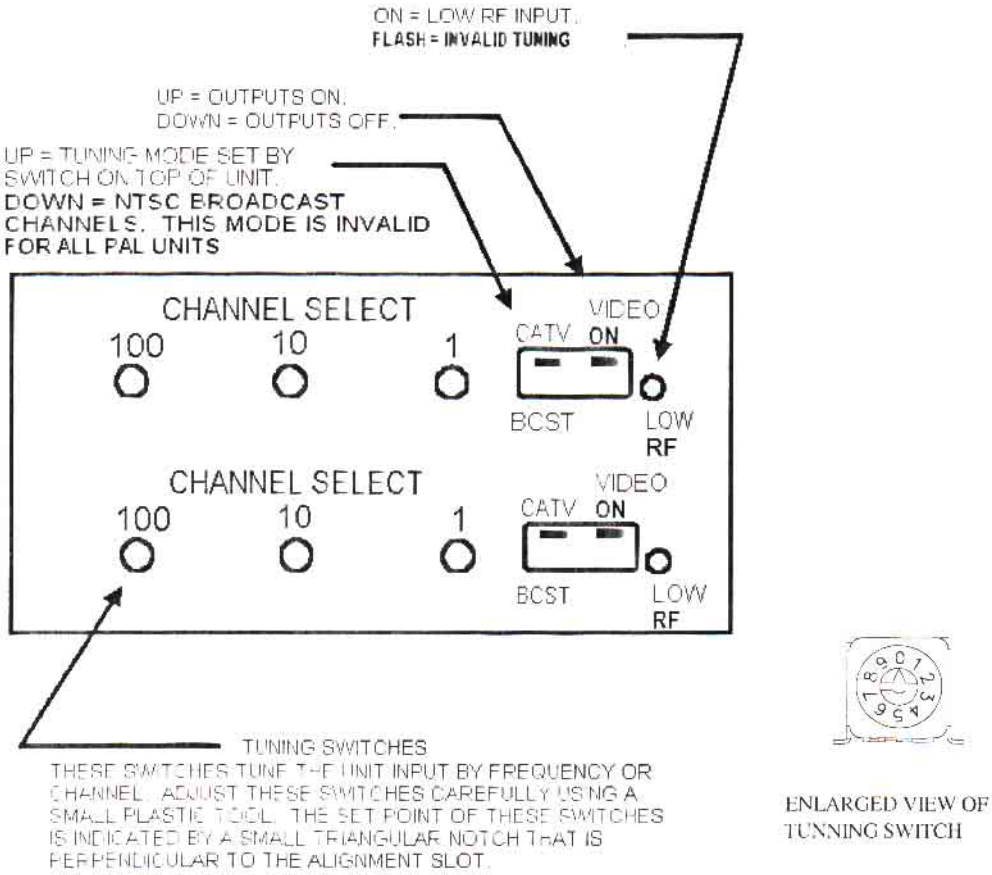
Set the tuning switches to the desired channel. If the unit is driving an LCM-550 with normal audio, no internal adjustments will be required. See Figure 1 for front panel controls.

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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.

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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.

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

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INTERNAL CONTROLS

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

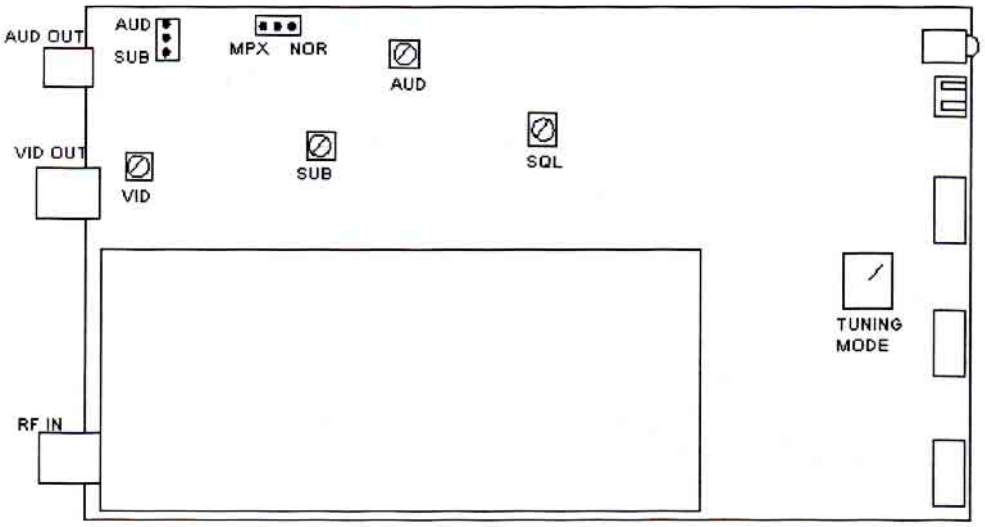


Figure 2

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	DON'T CARE
NORMAL AUDIO	AUD	NOR
MULTIPLEXED AUDIO	AUD	MPX

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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.

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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 75Ω
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 600Ω unbalanced
MPX Audio Output (NTSC)	500 mV p-p into 600Ω unbalanced
Audio Subcarrier Output	> +40dBmV into 75Ω 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.

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

EIA Standard Channel Plan			
Chan.	STD	HRC	IRC
2	55.25	54.00	55.26
3	61.25	60.00	61.26
4	67.25	66.00	67.26
5 (A-7)	77.25	78.00	79.26
6 (A-6)	83.25	84.00	85.26
7	175.25	174.01	175.26
8	181.25	180.01	181.26
9	187.25	186.01	187.26
10	193.25	192.01	193.26
11	199.25	198.01	199.26
12	205.25	204.01	205.26
13	211.25	210.01	211.26
14 (A)	121.26	120.01	121.26
15 (B)	127.26	126.01	127.26
16 (C)	133.26	132.01	133.26
17 (D)	139.25	138.01	139.26
18 (E)	145.25	144.01	145.26
19 (F)	151.25	150.01	151.26
20 (G)	157.25	156.01	157.26
21 (H)	163.25	162.01	163.26
22 (I)	169.25	168.01	169.26

OFF-AIR	
Chan.	BCST
2	55.25
3	61.25
4	67.25
5	77.25
6	83.25
7	175.25
8	181.25
9	187.25
10	193.25
11	199.25
12	205.25
13	211.25
14	471.25
15	477.25
16	483.25
17	489.25
18	495.25
19	501.25
20	507.25
21	513.25
22	519.25

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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

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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

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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

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

EIA Standard Channel Plan			
Chan.	STD	HRC	IRC
104	673.25	672.03	673.26
105	679.25	678.03	679.26
106	685.25	684.03	685.26
107	691.25	690.03	691.26
108	697.25	696.03	697.26
109	703.25	702.04	703.26
110	709.25	708.04	709.26
111	715.25	714.04	715.26
112	721.25	720.04	721.26
113	727.25	726.04	727.26
114	733.25	732.04	733.26
115	739.25	738.04	739.26
116	745.25	744.04	745.26
117	751.25	750.04	751.26
118	757.25	756.04	757.26
119	763.25	762.04	763.26
120	769.25	768.04	769.26
121	775.25	774.04	775.26
122	781.25	780.04	781.26
123	787.25	786.04	787.26
124	793.25	792.04	793.26
125	799.25	798.04	799.26

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