



DSK-550

**FREQUENCY AGILE “DESKTOP” TELEVISION
MODULATOR**

INSTRUCTION MANUAL

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DSK-550

Specifications

Output Frequency Range	Channel 2 (55.25MHz) through 547.25MHz. Selectable by front panel DIP switch in 2MHz increments (250KHz internal adjustment)
F.C.C. Offset	+12.5KHz tunable by front panel adjustment
Output Power Level	+40dBmV minimum per channel
Frequency Accuracy / Stability	<±5KHz of selected channel frequency
Video Performance	1V P-P input nominal for 80% modulation. Differential gain <5% Differential Phase <5°
Spurious Outputs	>60dB typical, 55dB below output visual carrier level
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 25KHz deviation, front panel adjustable. 10K input Z
Audio Intercarrier Stability	4.5MHz within ±1KHz
BTSC Stereo / Mono	Internal defeat of audio pre-emphasis for BTSC baseband inputs. Shipped mono mode
Front Panel Controls	RF output adjust A/V ratio adjust Video & Audio modulation F.C.C. offset adjust Channel select DIP switches
Rear Panel Connectors	RCA type video/audio input Type F RF output
Power Consumption	<12 watts
Chassis Size	2"H x 6.75W x 5.75D

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Frequency Agile Television Modulator

1.) INTRODUCTION

The Olson Technology DSK-550 is a frequency agile F.C.C. compatible modulator in a 5 ¾”D x 6 ¾”W x 2”H desktop chassis. The DSK-550 may be operated at 45dBmV typical, +40dBmV guaranteed minimum. No IF loops are provided on this modulator.

The DSK-550 modulator will operate on any standard, or cable channel from 55.25MHz – 547.25MHz. 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.

The DSK-550 features >76dB out-of-band C/N ratio. SAW filtering is used for adjacent channel operation and provides 55dB of spurious free dynamic range.

The DSK-550 has low power consumption 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.

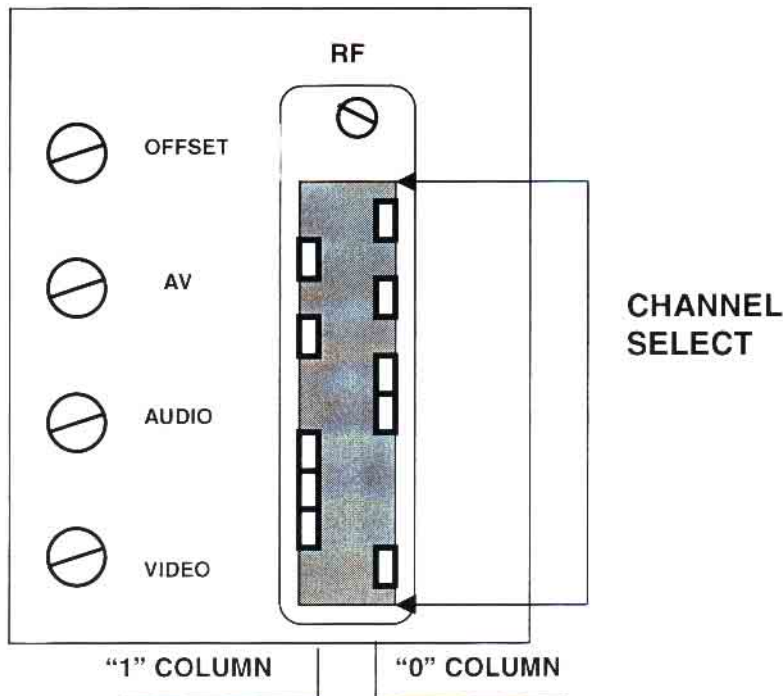


Figure 1 – DSK-550 Front Panel

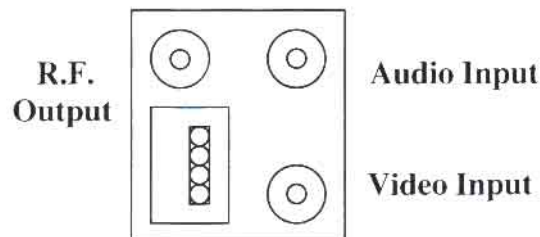
Switch-setting codes for sub-band channels are shown in Table 1. Switch-setting codes for standard channel frequencies can be found in Table 2 in this manual, HRC code settings are shown on Table 3. The front panel illustration in Figure 1 shows a switch properly set for Channel 2.

3.) F.C.C. OFFSET ADJUSTMENT

F.C.C. Offset frequencies are shown in Table 4. To adjust the frequency of a selected channel to provide the correct F.C.C. offset, look up its offset frequency in Table 4. Remove the video input and connect a counter to the RF output of the DSK-550. Use the front panel offset adjust control to set the output frequency to the correct value.

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).

DSK-550 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

The DSK-550 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, remove cover screws (top, sides, and front), disconnect and remove the DSK-550 module from the chassis and remove its left side cover. Locate the small trace to the rear of, and slightly above U16, which runs up and down just to the rear of C116. Note that this trace is connected to the rear side of C116. Cut this vertical trace.

Replace the module cover, replace the module in the chassis, 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 4.5MHz 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 DSK-550 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 DSK-550 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.

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

RF O	POSITION
O OFFSET 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.

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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

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Figure 2 - Channel Switch Setting Codes

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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

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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

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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	0	1	0
426	58	VV	1	0	0	0	0	0	0	0	1	1
432	59	WW	1	0	0	0	0	0	0	1	0	1
438	60	XX	1	0	0	0	0	0	0	1	1	0
444	61	YY	1	0	0	0	0	0	1	0	0	0
450	62	ZZ	1	0	0	0	0	0	1	0	0	1
456	63	63	1	0	0	0	0	0	1	0	1	1
462	64	64	1	0	0	0	0	0	1	1	0	0
468	65	65	1	0	0	0	0	0	1	1	1	0
474	66	66	1	0	0	0	0	0	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

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

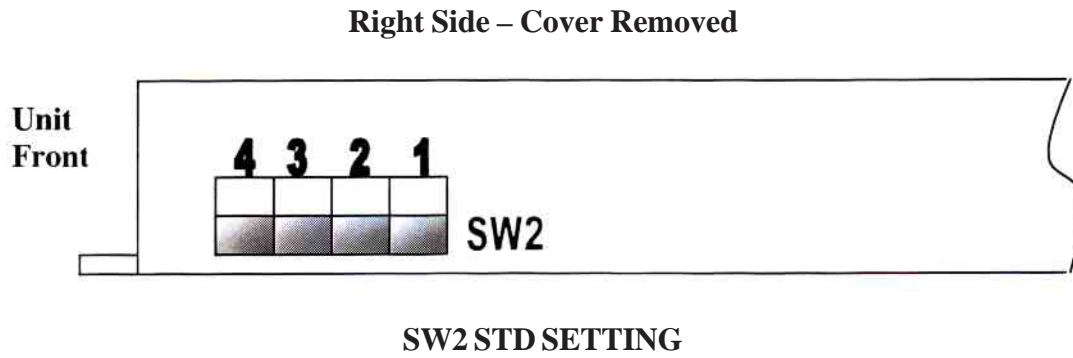
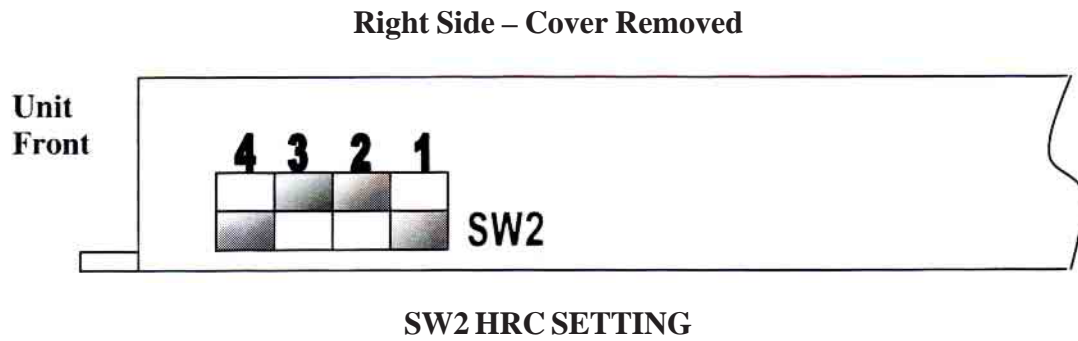


Figure 3 - INTERNAL SW2 SETTINGS FOR HRC / STD