

FLESHER CORP

DM-170

DEMODULATOR

SPECIFICATIONS

Filter Frequencies:

Mark 2125 Hz
Space 2295 Hz

Input:

Voltage 100 mVRMS min.
Impedance 1K ohms

Outputs:

Loop Keyer
Autostart
Scope mark & space
Tuning meter

Power required: $\pm 15V @ 50 \text{ mA}$

CONSTRUCTION

Use only a small wattage soldering iron (25 watts or less) with a fine tip to avoid damage to the circuit board.

Use the component location drawings and the parts list to assemble the DM-170, and follow the suggested sequence given below for easy assembly. It is presumed that the kit builder has sufficient knowledge of components to identify them.

- (✓) Install all jumper wires on the board. (There are 10)
- (✓) Install all diodes except D1 and D2. They will be installed later in the tuning procedure.
- (✓) Install all resistors except R14, R15, R18, R19, R22, R23, R26, R27, R30, R31, R34 and R35. These will be installed later in the tuning procedure.
- (✓) Install all 7 IC's. Observe the proper location of the locating key.
- (✓) Install all capacitors. Observe polarity where marked.
- (✓) Install transistors Q1, Q2, Q3 and Q4.
- (✓) Install Q5 with its metal surface nearest the circuit board edge connector.

Construction - Cont'd.

- (✓) Install Q6 with its metal surface away from the circuit board edge connector.

TUNING

- (✓) Install Resistors R14, R18, and R22, but do not cut off the leads yet.
- (✓) Connect the 10K trimmer potentiometer across the leads of R14. Make sure none of the leads of the trimmer pot are touching.
- (✓) Connect an audio frequency signal generator to the input of the DM-170. Set the frequency to 2125 Hz. Connect an oscilloscope or AC voltmeter to the "scope mark" output"
- (✓) Apply proper power supply voltages, and set the level of the signal generator until 100 to 500 mV of signal is measured at the "scope mark" output. Adjust the trimmer pot for maximum amplitude. Note: Throughout the tuning procedure, it may be necessary to reduce the level of the signal generator to prevent saturation in the filters. The signal level should not exceed 15 volts P-P (5.3 VRMS) during tuning, at the outputs.
- (✓) Disconnect power and remove the trimmer pot. Do not change the adjustment of the trimmer. Measure the resistance between the terminals of the pot which were used in the circuit. Select a resistor from the assortment of tuning resistors which is closest to the measured value of the trimmer, and install it as R15. (See note on tuning)
- (✓) Connect the trimmer pot across R18, and repeat the tuning procedure to determine a resistor value for R19.
- (✓) Connect the trimmer pot across R22 and repeat the tuning procedure again to determine a resistor value for R23.
- (✓) Clip off all excess leads.
- (✓) Install resistors R26, R30 and R34, but do not clip off the leads.
- (✓) Connect the trimmer pot across the leads of R26.
- (✓) Set the signal generator to 2295 Hz. Connect the oscilloscope or AC voltmeter to the "scope space" output. Set the level of the signal generator until 100 to 500 mV is measured at the "scope space" output. Adjust the trimmer pot for maximum amplitude. Continue the tuning procedure described above and install the resistor found as R27.
- (✓) Connect the trimmer pot across R30, and repeat the tuning procedure to determine a resistor value for R31.
- (✓) Connect the trimmer pot across R34 and repeat the tuning procedure to determine a resistor value for R35.
- (✓) Clip off excess leads.
- (✓) To check the tuning, set the signal generator to 2125 Hz and adjust the output level until the signal measured at the "scope mark" output is 15 volts P-P (5.3V RMS). Without changing the signal generator output level, set the frequency to 2295 Hz. The signal measured at the "scope space" output should be 15 volts P-P (5.3V RMS) $\pm 20\%$. If not, the tuning should be rechecked.
- (✓) When the tuning is determined to be satisfactory, install diodes D1 and D2 to complete the DM-170.

DM-170 DEMODULATOR

Tuning - Cont'd.

A Note on Tuning:

The tuning resistor selection included in this kit should be sufficient to bring the filters into good tune. For peak performance, series and parallel combinations of these and other resistors may be used for precise tuning.

If any of the filters cannot be tuned with tuning resistors in the range of 1.8K to 10K ohms, the associated parallel resistor should be changed as indicated.

Requires greater than 10K ohms to tune: Change associated parallel resistor to a slightly higher value.

Requires less than 1.8K ohms to tune: Change associated parallel resistor to a slightly lower value.

✓ Mark Hold: Improved "mark hold" operation can be accomplished by adding a diode from pin 1 of IC6 to the junction of D9 and R51. (Cathode to D9/R51) An extra diode is included in the kit.

Timing Functions:

Auto-start turn-on time may be changed by changing the value of R57. A larger value will give a longer delay before turning on.

Auto-start turn-off time may be changed by changing the value of R58. A larger value will delay the turn-off longer.

Auto-start threshold may be made adjustable by removing R56 and connecting a 20K to 50K pot from the auto-start threshold connection to ground.

PARTS LIST

R1	220 ✓	R20	390K ✓	R40	390K ✓	R59	4700 ✓
R2	10K ✓	R21	39K ✓	R41	390K ✓	R60	15K ✓
R3	1K ✓	R23	*	R42	24K ✓	R61	1K ✓
R4	1500 ✓	R24	390K ✓	R43	2200 ✓	R62	1K ✓
R5	220 ✓	R25	39K ✓	R44	12K ✓	R63	15K ✓
R6	1K ✓	R26	620	R45	2200 ✓		
R7	560 ✓	R27	*	R46	390K ✓	C1	.1 disk ✓
R8	2200 ✓	R28	390K ✓	R47	39K ✓	C2	.1 disk ✓
R9	330 ✓	R29	39K ✓	R48	3900 ✓	C3	4.7 electrolytic ✓
R10	1K ✓ changed to 2200	R30	620	R49	1K ✓	C4	.1 disk ✓
R11	1800 ✓	R31	*	R50	1K ✓	C5	.05 mylar ✓
R12	1500 ✓	R32	390K ✓	R51	15K ✓	C6	.05 mylar ✓
R13	39K ✓	R33	39K ✓	R52	100K ✓	C7	.005 mylar ✓
R14	750	R34	620	R53	100K ✓	C8	" ✓
R15	*	R35	*	R54	8200 ✓	C9	" ✓
R16	390K ✓	R36	390K ✓	R55	39K ✓	C10	" ✓
R17	39K ✓	R37	2200 ✓	R56	12K ✓	C11	" ✓
R18	750	R38	100K ✓	R57	100K ✓	C12	" ✓
R19	*	R39	100K ✓	R58	390K ✓	C13	" ✓
R22	750						

used 120K

*tuning resistor

all diodes: 1N4148

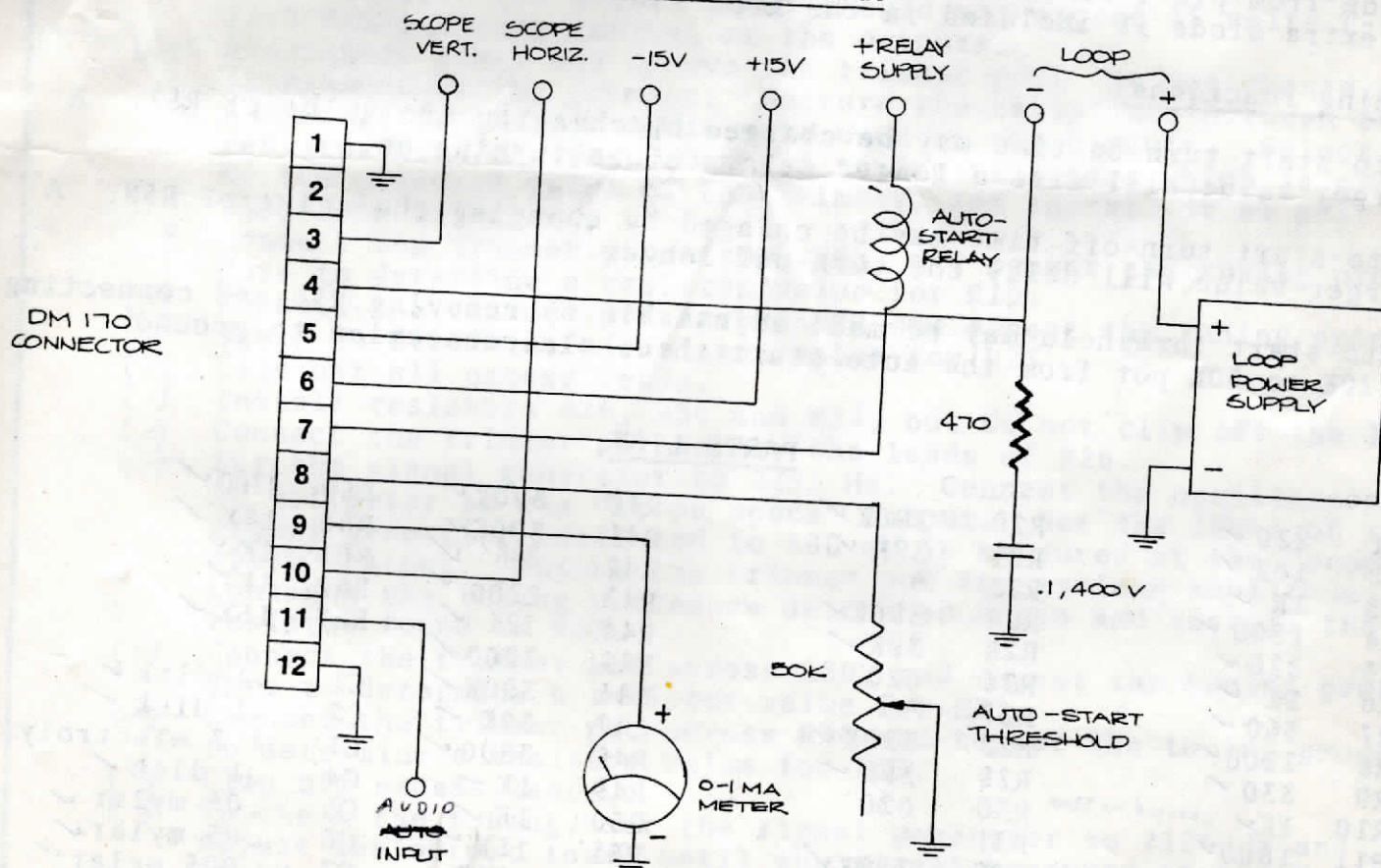
Parts List - Cont'd.

C14	.005 mylar ✓
C15	" ✓
C16	" ✓
C17	" ✓
C18	" ✓
C19	" ✓
C20	" ✓
C21	4.7 electrolytic ✓
C22	.22 mylar ✓
C23	.005 mylar ✓
C24	.22 mylar ✓
C25	1.0 electrolytic ✓
C26	15 electrolytic ✓
C27	15 electrolytic ✓
C28	15 electrolytic ✓

IC1	1458 ✓
IC2	1458 ✓
IC3	1458 ✓
IC4	1458 ✓
IC5	1458 ✓
IC6	1458 ✓
IC7	1458 ✓

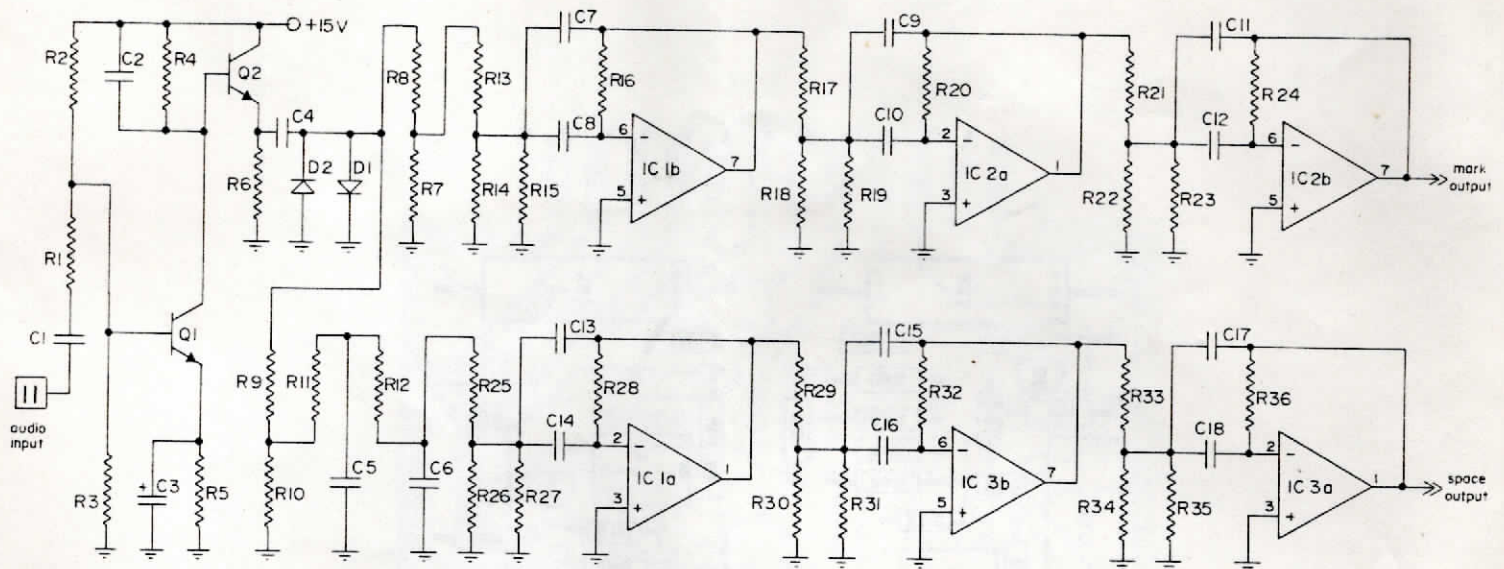
Q1	2N4123 ✓
Q2	2N4123 ✓
Q3	2N4123 ✓
Q4	2N4123 ✓
Q5	2N4921 ✓
Q6	MJE 340 ✓

CONNECTION DIAGRAM



FLESHER CORP.

DM-170 170 Hz shift RTTY demodulator



+15 V to pin 8, -15 V to pin 4, all IC's

