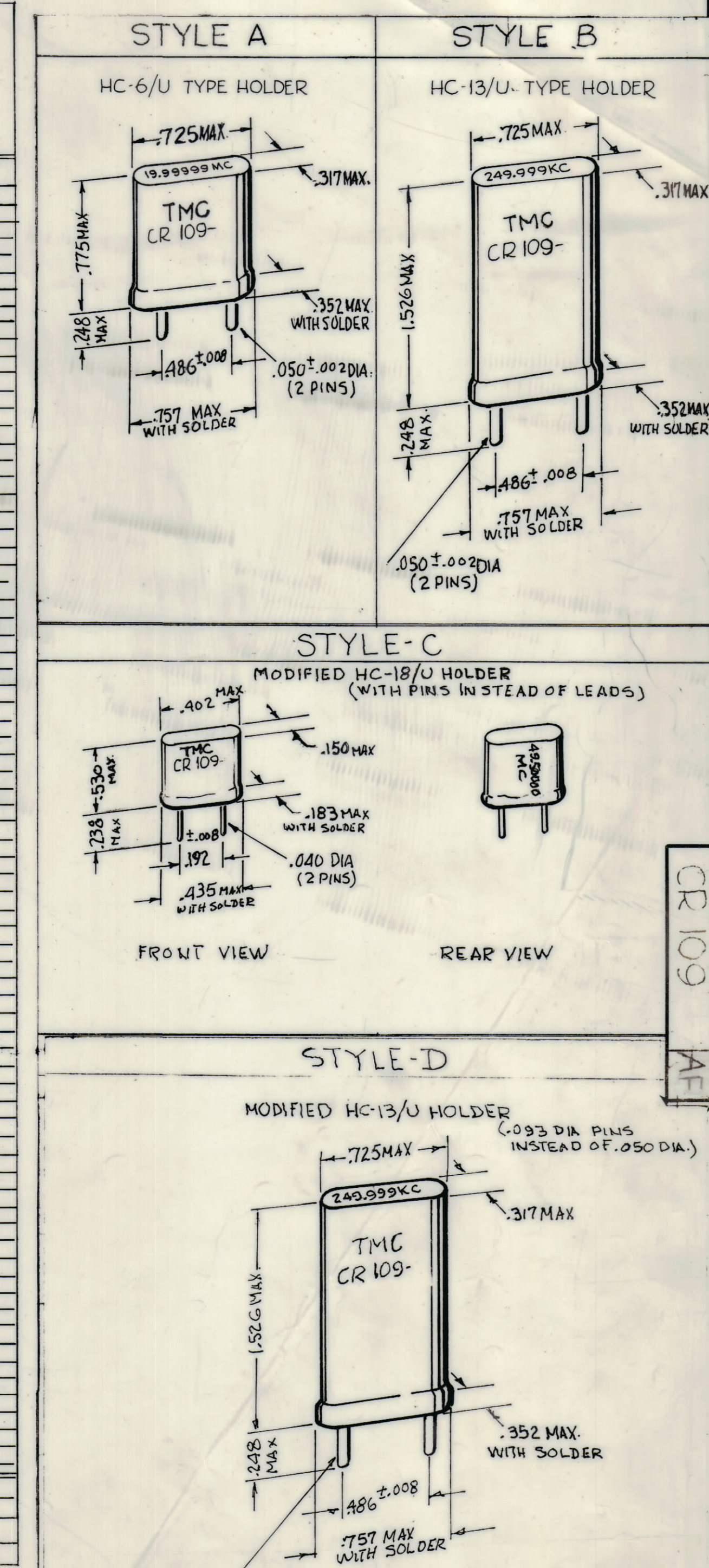


REVISIONS					
DATE	E.M.N. NO.	DRAFT	CHKD	APPD	BY
5/21/68	18934	CU	HK	FB	AB
6/24/68	19152	CU	HK	FB	AC
7/11/68	19689	CU	HK	FB	AD
9/1/70	20162	SE	W	FB	AE
6-7-71	20375	RZ	W	FB	AF

TMC PART NO.	HOLDER TYPE	PICTORIAL STYLE	COLUMN F FREQUENCY STAMPING INFORMATION (STAMP CRYSTAL UNIT WITH FREQUENCY SHOWN IN COLUMN INDICATED BELOW)	COLUMN S SERIES RESONANT FREQUENCY	COLUMN P PARALLEL RESONANT FREQUENCY	RESONANCE LOAD CAPACITY	FREQ. TOL. AT OPERATING TEMPERATURE	OPERATING TEMPERATURE RANGE	FREQUENCY DEVIATION OVER OPERATING TEMP. RANGE	OPERABLE TEMPERATURE RANGE	TURNOVER TEMPERATURE	HARMONIC OF QUARTZ VIBRATION	RATED DRIVE LEVEL	PIN TO PIN CAPACITANCE MAX. UNLESS TOLERANCES INDICATES MIN. VALUE ALSO	MAXIMUM EFFECTIVE RESONANCE RESISTANCE AT OPERATING TEMPERATURE OHMS	REMARKS	USED ON MODEL
CR 109-1	HC-6/U	A	COLUMN "P"	1.25000MC	130 ± 10%	1.250130 MC	32 ± 5 pf	± 0.002% (75°C)	75° ± 5°C.	0.0005%	0°C. to +90°C.	75° +5°C.	FUNDAMENTAL	5 MW	3.0-4.0 pf	400@ (75°C)	AFC-2,3 Y5000
2	HC-6/U	A		1.499800MC	200 ± 10%	1.500000 MC	10 ± 5 pf	± 0%	± 0.003%	0°C. to +90°C.	75° +5°C.	FUNDAMENTAL	5 MW	3.1-4.1 pf	400	AFC-2,3 Y5001	
3	HC-6/U	A		9.996750MC	3250 ± 10%	10.000000 MC	10 ± 5 pf	± 0%	± 0.003%	0°C. to +90°C.	75° +5°C.	FUNDAMENTAL	2.5 MW	5.0-6.2 pf	25	AFC-2,3 Y5002	
4	HC-6/U	A		10.70275 MC	2250 ± 10%	10.705000 MC	10 ± 5 pf	± 0%	± 0.003%	0°C. to +90°C.	75° +5°C.	FUNDAMENTAL	2.5 MW	3.0-4.0 pf	25	AFC-2 Y5003	
5	HC-6/U	A		11.99740 MC	2600 ± 10%	12.000000 MC	10 ± 5 pf	± 0%	± 0.003%	0°C. to +90°C.	75° +5°C.	FUNDAMENTAL	2.5 MW	3.4-4.4 pf	25@ (75°C)	AFC-2 Y5003	
6	HC-13/U	B				3.100 KC	10 ± 5 pf	± 0%	± 0.003%	0°C. to +90°C.	75° +5°C.	FUNDAMENTAL	.1 MW	16.0 pf	350,000 (25°C)	TEST NOTE # 1	HFS-1
7						3.200 KC											
8						3.300 KC											
9						3.400 KC											
10						3.500 KC											
11						3.600 KC											
12						3.700 KC											
13						3.800 KC											
14						3.900 KC											
15						4.000 KC											
16						27.000 KC								16.0 pf	350,000	TEST NOTE # 1	
17						28.000 KC								12.0 pf	50,000		
18						29.000 KC											
19						30.000 KC											
20						31.000 KC											
21						32.000 KC											
22						33.000 KC											
23						34.000 KC											
24						35.000 KC											
25	HC-13/U	B				36.000 KC							.1 MW	12.0 pf	50,000		
26	HC-6/U	A				320.000 KC							2.0 MW	7.0 pf	3,500		
27						330.000 KC											
28						340.000 KC											
29						350.000 KC											
30						360.000 KC											
31						370.000 KC											
32						380.000 KC											
33						390.000 KC											
34						400.000 KC											
35						410.000 KC											
36						2.900000 MC							2.0 MW		3,500		
37						3.000000 MC							5 MW		250		
38						3.100000 MC											
39						3.200000 MC											
40						3.300000 MC											
41						3.400000 MC											
42						3.500000 MC											
43						3.600000 MC											
44						3.700000 MC											
45	HC-6/U	A				3.800000 MC											
46	SPECIAL	C				48.500000 MC	10 ± 8 pf	± 0%	± 0.005%			FUNDAMENTAL	5 MW		250 (25°C)		
47						49.500000 MC	10 pf	± 0.005%				3rd or 5th	2.0 MW		55 (25°C)		
48						50.500000 MC											
49						51.500000 MC											
50						52.500000 MC											
51						53.500000 MC											
52						54.500000 MC											
53						55.500000 MC											
54						56.500000 MC											
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69						71.500000 MC											
70						72.500000 MC											
71						73.500000 MC											
72						74.500000 MC											
73						75.500000 MC											
74						76.500000 MC											
75	SPECIAL	C	COLUMN "P"			77.500000 MC	10 pf	± 0.05% (25°C)	± 0.005%	0°C to +64°C		3rd or 5th	2.0 MW	7.0 pf	55 (25°C)		HFS-1
76	HC-13/U	B	COLUMN "P"			100.000 KC	10 pf	± 0.1%	± 0.005%	-40°C to +70°C		FUNDAMENTAL	2 MW Not Specified	10.000	10,000	Use CR 98 A/U	GRB-93
77	HC-6/U	A	COLUMN "P"			705.000 KC	32 ± 5	± 0.02% (75°C)	± 0.005%	0°C to +90°C		FUNDAMENTAL	5 MW	7.0 pf	1,000@75°C		SBS-1
78	SPECIAL	D	COLUMN "S"	100.000 KC				± 0.02% (25°C); 0°C to +65°C	± 0.2%	0°C to +65°C		FUNDAMENTAL	1.5 MW	Not Specified	1500 MAX @ 25°C	SUPERSEDES CR-106	DVM-2,3,4
79	HC-6/U	A	COLUMN "P"			438.000 KC	20 pf	± 0.02% (75°)	± 0.005%	-40°C to +80°C	75°C ± 5°C	FUNDAMENTAL	2 ± 5MW	NOT SPECIFIED	3,000Ω		MSR-5,9
CR 109-80	HC-6/U	A	COLUMN "P"			472.000 KC	20 pf	± 0.02% (75°)	± 0.005%	-40°C to +80°C	75°C ± 5°C	FUNDAMENTAL	2 ± 5MW	NOT SPECIFIED	3,000Ω		MSR-5,9



MANUFACTURING AND TEST NOTES:

- Manufactured in accordance with MIL-C-3098C and Amendments.
- Test will be made with Test Equipment Type TS-350/TSM (for 800 KC to 14,999,999 KC) or TS-710/TSM (for 3 KC to 11,000 KC).
- Holders shall conform (construction, etc.) to MIL-C-3098C and MIL-H-10056.

MARKING NOTES:

- All marking, except "TMC, CR-109-X," shall be etched, metal stamped, branded or engraved.
- All units shall be marked with the month and year of the last manufacturing test, ± ten days, (e.g. 1-61; 12-61) using any method and location convenient to the manufacturer.
- All units shall be marked with the mfrs. code or name in any location convenient to mfr.
- The frequency which shall be stamped on the crystal unit may be found by referring to Column "P" in chart.
- If the specified frequency (as per Note three) is less than 10 MC per second the frequency marking shall consist of all digits, through cycles per seconds (e.g., 9.000750 MC; 3.120 KC). If the specified frequency is 10 MC per second or more, the frequency marking shall consist of the first seven digits (e.g., 10,70275 MC; 75.30580 MC).
- Frequencies below 1 MC per second shall be expressed in Kilocycles per second (KC/sec) and frequencies of 1 MC per second and above shall be expressed in Megacycles per second (MC/sec).
- All units will be marked with the letters "TMC" and the TMC Part Number as specified in chart and shown in Pictorials (e.g., TMC CR-109-10). The marking shall be rubber stamped with black ink, silk screened, or an equivalent process and shall have a clear coating to prevent removal of stamping. Coating shall not interfere with operation of crystal unit.

TOLERANCE NOTES:

- All Frequency Tolerances shown with ▲ symbol apply to the Series Resonant Frequency only.

TEST NOTES:

- GROUND CRYSTAL CASE DURING TESTING
- CRYSTAL UNITS CR109-90 THRU CR109-140 MUST MAINTAIN THEIR SPECIFIED RESISTANCES OVER THE OPERATING TEMPERATURE. NO ADJUSTMENTS ARE ALLOWED TO THE CI METER WHILE CRYSTAL UNIT IS BEING SUBJECTED TO TEMPERATURE EXTREMES.

STANDARD DRAWING

NOTES

REQD.	ITEM	PART NUMBER	DESCRIPTION	SYMBOL
STRONIER LIST OF MATERIAL				
THE TECHNICAL MATERIEL CORP. MAMARONECK, NEW YORK				
CRYSTAL UNIT, QUARTZ (SPECIALS)				
CR 109 AF				
SHEET 1 OF 2				