Numeric Display Data

19. The numeric display data, i.e. frequency, channel number, BFO frequency and bandwidth display data, is routed to the front panel switch and display board from the microcomputer via the IOD bus and the front panel memory board. Circuitry on the front panel memory board also produces the number display strobe and the number display address.

20. Hexadecimal 31 is applied to the IOC bus to initially set the number display address in readiness for the next numerical display update routine. The '1' at the IOC5 line enables U3a for the write strobe ($\overline{WSTB}$) signal, the negative-going edge of which clocks U19 to transfer hex. zero at IOD bus lines 0 to 3 to the parallel inputs P1 to P4 of the up-counter U12. The '1' at the IOC5 line is also applied to NAND gate U6d where it is combined with the '1' at the IOC4 line to produce a '0' at the output. This is combined with the negative-going write strobe signal (NOR gate U7b) to produce a '1' at the trigger (A) input of the pulse generator U9a, U9b. The negative-going output pulse removes the inhibit condition from U8, and since both the A and strobe inputs are both at '1' (A input from the IOC1 line, strobe input from the collector of non-conducting transistor Q4), a positive-going pulse is produced at the S1 output. This is applied to the preset-enable (PE) input of up-counter U12, and the zero code at the parallel inputs is transferred via the Q outputs as the number display address to the front panel switch and memory board.

21. Hexadecimal 30 is then applied to the IOC bus coincident with the 7-segment BCD data for the 10 Hz frequency digit, which is applied to the IOD bus (lines 0 to 3). The '1' at the IOC5 line together with the negative-going write strobe signal transfers the 10 Hz frequency digit data to the front panel switch and display board via U19 and data bus lines DB0 to DB3, whilst the combination of the '1' at the IOC5 line, the '1' at the IOC4 line, and the write strobe signal produces a positive going pulse at the S0 output of U8 (A,B,C and D inputs all at '0'). This is inverted by NAND gate U6b, a negative-going number display strobe pulse is produced, and the 10 Hz frequency digit data is loaded into the appropriate LCD driver stage on the front panel switch and display board.

22. The positive-going edge of the negative-going pulse from U6b is applied via AND gate U5b to the clock input of up-counter U12, which then increments the number display address. Hexadecimal 30 is then repeatedly applied to the IOC bus to update, in turn, the remaining numeric displays, as listed in table 6.

Table 6: Numeric Display Data

NUMBER DISPLAY ADDRESS					DATA BUS (DB0 to DB3)	
HEX	N3	N2	N1	N0		
1	0	0	0	1	10 Hz	
2	0	0	1	0	100 Hz	OPERATING
3	0	0	1	1	1 kHz	FREQUENCY
4	0	1	0	0	10 kHz	DISPLAY
5	0	1	0	1	100 kHz	DATA
6	0	1	1	0	1 MHz	
7	0	1	1	1	10 MHz	
8	1	0	0	0	CHANNEL NUMBER LS DIGIT	
9	1	0	0	1	CHANNEL NUMBER MS DIGIT	
A	1	0	1	0	NOT USED	
B	1	0	1	1	10 Hz	
C	1	1	0	0	100 Hz	BFO FREQUENCY DATA
D	1	1	0	1	1 kHz	
E	1	1	1	0	BANDWIDTH LS DIGIT	
F	1	1	1	1	BANDWIDTH MS DIGIT	

Non-Numeric Display Data

23.   The strobe signals for the non-numeric display drivers on the front panel switch and display board are produced at the S2 to S7 output pins of U8, in response to IOC bus output port addresses 32 to 37 respectively. For each of these addresses, the combination of the '1' at the IOC5 line and the negative-going write strobe signal transfers the display data from the IOD bus to the DB bus via U19 and U20, whilst the combination of the '1' at the IOC5 line, the '1' at the IOC 4 line and the write strobe signal removes the inhibit from, and applies the strobe to, U8. The levels at the IOC0 to IOC3 lines are then decoded to produce the required output strobe signal (table 7).

IOC BUS			DISPLAY DATA	
HEX	7 6 5 4	3 2 1 0	BIT NO.	DATA
32	0 0 1 1	0 0 1 0	0	ISB
			1	LSB
			2	USB
			3	AM
			4	CW
			5	FM
			6	AUX
			7	FAULT
33	0 0 1 1	0 0 1 1	0	MAN
			1	SHORT
			2	MED
			3	LONG
			4	MUTE
			5	BANDWIDTH DP1 (RH)
			6	BANDWIDTH DP2 (LH)
			7	BANDWIDTH kHz
34	0 0 1 1	0 1 0 0	0	BFO-, kHz. BFO DP
			1	BFO +
			2	RF METER SCALE
			3	AF METER SCALE
			4 - 7	NOT USED
35	0 0 1 1	0 1 0 1	0	SCAN
			1	REMOTE
			2	BFO
			3	TUNE
			4	!
			5	CHANNEL
			6	FREQUENCY
			7	kHz and dp
36	0 0 1 1	0 1 1 0	0	M1
			1	M2
			2	M3 METER READING
			3	M4 10(-9) to 8(-2)
			4	M5
			5	M6
			6	M7
			7	M8
37	0 0 1 1	0 1 1 1	0	M9
			1	M10 METER READING
			2	M11 90(-1) to 120 (+2)
			3	M12